

PART 1      GENERAL1.1      RELATED SECTIONS

- .1      Section 32 12 16.01 - Asphalt Paving - Short Form.
- .2      Section 33 05 13 - Manholes and Catch Basin Structures.
- .3      Section 33 07 16 - Factory Pre-Insulated Piping Systems for Utility Applications.
- .4      Section 33 11 16 - Site Water Utility Distribution Piping.
- .5      Section 33 31 13 - Public Sanitary Utility Sewerage Piping.
- .6      Section 33 41 00 - Storm Utility Drainage Piping.

1.2      REFERENCES

- .1      American Society for Testing and Materials International (ASTM)
  - .1      ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m<sup>3</sup>).
- .2      Ontario Provincial Standard Specifications (OPSS)
  - .1      OPSS 1010-April 2004 - Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

1.3      DEFINITIONS

- .1      Excavation: excavation of materials of whatever nature including concrete and asphaltic concrete pavement structures.
- .2      Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3      Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .4      Unsuitable materials:
  - .1      Weak, chemically unstable, and compressible materials.
  - .2      Frost susceptible materials designated by Departmental Representative.
  - .3      Asphaltic concrete and concrete materials.
  - .4      Rock materials not meeting gradation requirements of approved backfill.

- .5 Rock: solid material in excess of 1.00 m<sup>3</sup> and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m<sup>3</sup> bucket. Frozen material is not classified as rock.

#### 1.4 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Quality Control:
  - .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.
  - .2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.
  - .3 Submit to Departmental Representative written notice at least 7 days prior to excavation work.
  - .4 Submit to Departmental Representative inspection results and report as described in PART 3 of this Section.
- .3 Preconstruction Submittals:
  - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
  - .2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field, clearance record from utility authority, and location plan of relocated and abandoned services.
- .4 Samples:
  - .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
  - .2 Inform Departmental Representative at least 2 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

#### 1.5 QUALITY ASSURANCE

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

#### 1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

#### 1.7 EXISTING CONDITIONS

- .1 Buried services:
  - .1 Before commencing work establish location of buried services on and adjacent to site.

- .2 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
  - .3 Prior to beginning excavation Work, notify applicable Departmental Representative to establish location and state of use of buried utilities and structures. Departmental Representative to arrange to clearly mark such locations to prevent disturbance during Work.
  - .4 Confirm locations of buried utilities by careful test excavations.
  - .5 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
  - .6 Record location of maintained, re-routed and abandoned underground lines.
  - .7 Confirm locations of recent excavations adjacent to area of excavation.
- .2 Existing buildings and surface features:
- .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
  - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair to the approval of the Departmental Representative.

## PART 2 PRODUCTS

### 2.1 MATERIALS

- .1 Subgrade fill and trench backfill shall be OPSS 1010 Granular B Type II.
- .2 OPSS 1010 Granular A shall be used for pipe bedding and cover, and for bedding and backfill of catch basin and manholes.
- .3 Pavement structure materials shall be as noted in Section 32 12 16.01 - Asphalt Paving - Short Form.

## 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 plan, specific to site, that complies with requirements of Authorities Having Jurisdiction.
- .2 Wrap catch basin grates on site and at driveway entrance with geotextile to capture any sediment carried by runoff.

- .3 Inspect, repair, and maintain erosion and sedimentation control measures during construction until construction is completed.
- .4 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

### 3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

### 3.3 PREPARATION/PROTECTION

- .1 Keep excavations clean, free of standing water, and loose soil.
- .2 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .3 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.
- .4 Protect buried services that are required to remain undisturbed.

### 3.4 STOCKPILING

- .1 Stockpile fill materials in areas designated by Departmental Representative.
  - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

### 3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

- .1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Ontario regulations.
- .2 During backfill operation:
  - .1 Unless otherwise indicated or approved by Departmental Representative, remove sheeting and shoring from excavations.

- .3 Upon completion of substructure construction:
  - .1 Remove shoring and bracing.
  - .2 Remove excess materials from site.

### 3.6 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
  - .1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water to approved runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.
- .6 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to sewers to meet sewer use by-law requirements of the City of Ottawa.

### 3.7 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions necessary for completion of the work.
- .2 Remove paving and other obstructions encountered during excavation.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations, including footings for overhead canopy.
- .4 Keep excavated and stockpiled materials safe distance away from edge of trench.
- .5 Restrict vehicle operations directly adjacent to open trenches.
- .6 Dispose of surplus and unsuitable excavated material off site.
- .7 Do not obstruct flow of surface drainage.
- .8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .9 Notify Departmental Representative when bottom of excavation is reached.

- .10 Obtain Departmental Representative approval of completed excavation.
- .11 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as approved by Departmental Representative.
- .12 Correct unauthorized over-excavation as follows:
  - .1 Fill with OPSS 1010 Granular B Type II fill compacted to not less than 95% of corrected Standard Proctor maximum dry density.
- .13 Hand trim, make firm and remove loose material and debris from excavations.
  - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
  - .2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.

### 3.8 BEDDING AND SURROUND OF UNDERGROUND SERVICES

- .1 Place and compact granular material for bedding and surround of underground services as specified in Section 33 11 16 - Site Water Utility Distribution Piping, Section 33 31 13 - Public Sanitary Utility Sewerage Piping, and Section 33 41 00 - Storm Utility Drainage Piping.
- .2 Place bedding and surround material in unfrozen condition.

### 3.9 BACKFILLING

- .1 Do not proceed with backfilling operations until completion of following:
  - .1 Departmental Representative has inspected and approved installations.
  - .2 Departmental Representative has inspected and approved of construction below finish grade.
  - .3 Inspection, testing, approval, and recording location of underground utilities.
  - .4 Removal of concrete formwork.
  - .5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .3 Do not use backfill material which is frozen or contains ice, snow or debris.
- .4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .5 Backfilling around installations:
  - .1 Place bedding and surround material as specified elsewhere.

3.10        RESTORATION

- .1        Upon completion of Work, remove waste materials and debris and correct defects to the approval of Departmental Representative.
- .2        Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .3        Clean and reinstate areas affected by Work to the approval of Departmental Representative.
- .4        Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

