

PART 1 - GENERAL

1.1 RELATED SECTIONS .1 Section 01 35 43 - Environmental Protection.

1.2 REFERENCES .1 American Society for Testing and Materials (ASTM)
.1 ASTM C117-04, Standard Test Method for Material
Finer Than 0.075 mm (No. 200) Sieve in Mineral
Aggregates by Washing.
.2 ASTM C136-06, Standard Test Method for Sieve
Analysis of Fine and Coarse Aggregates.
.3 ASTM D422-63(2007), Standard Test Method for
Particle-Size Analysis of Soils.
.4 ASTM D698-07, Standard Test Methods for
Laboratory Compaction Characteristics of Soil Using
Standard Effort (12,400 ft-lbs/ft³) (600 kN-m/m³).
.5 ASTM D4318-05, Standard Test Methods for Liquid
Limit, Plastic Limit, and Plasticity Index of Soils.
.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire,
Inch Series.
.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire,
Metric.
.3 Canadian Standards Association (CSA)
.1 CAN/CSA-A23.1/A23.2-04, Concrete Materials and
Methods of Concrete Construction.

1.3 DEFINITIONS .1 Excavation classes: two classes of excavation will
be recognized; common excavation and rock excavation.
.1 Rock: any solid material in excess of 0.25 m³
and which cannot be removed by means of heavy duty
mechanical excavating equipment with 0.95 to 1.15 m³
bucket. Frozen material not classified as rock.
.2 Common excavation: excavation of materials of
whatever nature, which are not included under
definitions of rock excavation.
.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.

1.3 DEFINITIONS
(Cont'd)

- .4 Unsuitable materials:
- .1 Weak and compressible materials under excavated areas.
 - .2 Frost susceptible materials under excavated areas.
 - .3 Frost susceptible materials:
 - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136: Sieve sizes to CAN/CGSB-8.1.
 - .2 Table
- | Sieve Designation | % Passing |
|-------------------|-----------|
| 2.00 mm | 100 |
| 0.10 mm | 45 - 100 |
| 0.02 mm | 10 - 80 |
| 0.005 mm | 0 - 45 |
- .3 Coarse grained soils containing more than 20% by mass passing 0.075 mm sieve.
- .5 Unshrinkable fill: very weak mixture of Portland cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 MEASUREMENT FOR
PAYMENT

- .1 Main Trench Excavation (Rock and Common) - Trench excavation to be measured in cubic metres (m³). Payment for excavation shall include backfill with excavated trench material, compaction, disposal of waste material off site, placing of excavated material at another location on site and all other items as outlined in this Section.
- .2 Trench length for measurement purposes will be measured continuously through manholes and other appurtenances and any extra excavation required for their construction outside the specified measurement trench width will be deemed to be included in the contract unit price for these structures and appurtenances.
- .3 Trench depth for measurement purposes shall be measured from original ground, less a deduction of 150 mm when grubbing required, to installed grade at bottom of trench as shown on the drawings. In areas of specified mass excavation, trench depth will be measured from the new ground elevation established after mass excavation.
- .4 Trench width for measuring purposes shall be the sum of the nominal diameters of the pipe in the trench plus pipe insulation plus 600 mm. When concrete pipe

1.4 MEASUREMENT FOR .4
PAYMENT
(Cont'd)

(Cont'd)
is used the outside diameter of the pipe rather than the nominal diameter shall be used to determine the trench width. The minimum width of main trench shall be: 1500 mm where the average depth is 0 to 4 m; 2000 mm where the average depth is greater than 4 m to 6 m.

- .5 Excavation and disposal of waste material is considered incidental to the unit price.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

- .2 Table

Sieve Designation	% Passing
Type 3	
101.6 mm	100
50 mm	75-100
4.75 mm	25-55
1.2 mm	10-35
0.3 mm	5-20
Sieve Designation	% Passing
0.075 mm	0-12

PART 3 - EXECUTION

3.1 SITE
PREPARATION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

3.2 EXCAVATION

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Notify Departmental Representative before removing any obstructions encountered during excavation.

3.2 EXCAVATION
(Cont'd)

- .3 Protect all utilities designated to remain and make repairs to any damage at contractor's own expense.
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 Dispose of surplus and unsuitable excavated material in approved location off site.
- .6 Do not obstruct flow of surface drainage.
- .7 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .8 Notify Departmental Representative when bottom of excavation is reached.
- .9 Obtain Departmental Representative's approval of completed excavation.

3.3 FILL TYPES AND
COMPACTION

- .1 Use fill of types as indicated.

3.4 BACKFILLING

- .1 Do not proceed with backfilling operations until Departmental Representative has inspected and approved installations.
- .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.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1.0 m.

3.5 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .3 Restore site to its normal state prior to excavation.