

PART 1 - GENERAL

1.1 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM D 698, Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600kN-m/m³).
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CSA A3000, Cementitious Materials Compendium.

1.2 QUALITY
ASSURANCE/REGULATORY
REQUIREMENTS

- .1 Shore and brace excavations, protect slopes and banks and perform all work in accordance with Provincial and Municipal regulations whichever is more stringent.
- .2 Comply with Explosives Act of Canada.
- .3 Perform blasting in accordance with Provincial and Municipal regulations. Repair damage to approval of Departmental Representative.
- .4 No blasting will be permitted within 3 m of any building and where damage would result.

1.3 TESTS AND
INSPECTIONS

- .1 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated by Departmental Representative.
- .2 Not later than one week before backfilling or filling, provide to designated testing agency, 23 kg sample of backfill for fill material proposed for use.
- .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.
- .5 Before commencing work, conduct, with Departmental Representative, condition survey of existing structures, trees and other plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

1.4 EXISTING
CONDITIONS

- .1 Examine soil report available from Departmental Representative.
- .2 Before commencing work verify the location of all buried services on and adjacent to the site.
- .3 Arrange with appropriate authority for relocation of

buried services that interfere with execution of work. Pay costs of relocating services.

- .4 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Granular B-Type I, B-Type II, Select Subgrade to OPSS1010. Sand to OPSS1004.
- .2 Crushed Granular to CCDG14.02.
- .3 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum Portland cement content of 25 kg/m³.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CSA-A23.1/A23.2,
 - .5 Cement: to CSA A3000, Type GU.
 - .6 Slump: 160 to 200 mm.

PART 3 - EXECUTION

3.1 PROTECTION/ PROTECTION

- .1 Protect excavations from freezing.
 - .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 Representative's 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.

3.2 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 Remove stumps and tree roots below footings, slabs, and paving, and to 600 mm below finished grade elsewhere.
- .3 Dispose of cleared and grubbed material off site daily to disposal areas acceptable to authority having jurisdiction.

3.3 EXCAVATION

- .1 Shore and brace excavations, protect slopes and banks and perform work in accordance with Provincial regulations.
- .2 Perform blasting in accordance with Provincial regulations: repair damage as directed by Departmental Representative.

- .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.
 - .1 Stockpile topsoil on site for later use.
- .4 Excavate as required to carry out work, in all materials met.
 - .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. Excavation taken below depths shown without Departmental Representative written authorization to be filled with concrete of same strength as for footings at Contractor's expense.
- .5 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.
- .6 Excavate for slabs and paving to subgrade levels.

- .1 In addition, remove all topsoil, organic matter, debris and other loose and harmful matter encountered at subgrade level.

3.4 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 subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as specified for fill.
- .5 Fill excavated areas with selected subgrade material or gravel and sand compacted as specified for fill.
- .6 Placing:
 - .1 Place backfill, fill and basecourse material in 150 mm lifts. Add water as required to achieve specified density.
- .7 Compaction: compact each layer of material to following densities for material to ASTM D698,
 - .1 To underside of basecourses: 95%.
 - .2 Basecourses: 100%.

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- .3 Concrete walks, curbs and gutters: 100%
 - .4 Elsewhere: 90%.
 - .8 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.
 - .9 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600 mm of foundations.
 - .10 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material.
 - .11 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.
 - .12 Underground tanks: use sand to bottom of granular basecourses or to bottom of topsoil, as applicable.
- 3.5 GRADING
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- .1 Grade so that water will drain away from buildings, walls and paved areas, to catch basins and other disposal areas approved by the Departmental Representative.
 - .1 Grade to be gradual between

finished spot elevations
shown on drawings.

3.6 SHORTAGE AND
SURPLUS

- .1 Supply all necessary fill to meet backfilling and grading requirements and with minimum and maximum rough grade variance.
- .2 Stockpile surplus material on site and confirm location with Departmental Representative. Separate USM material stockpile from OM material stockpile.

3.7 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.