

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 02 41 13 - Selective Site Demolition.

1.2 REFERENCES

- .1 *Cahier des charges et devis généraux (CCDG)*, Infrastructures routières – construction et réparation, Édition 2015, Québec, MTQ.
- .2 *Ontario Provincial Standard Specifications*, Ontario Ministry of Transportation.
- .3 American Society for Testing and Materials International (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 D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D1557-07, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .4 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.

1.3 DEFINITIONS

- .1 Earth: For payment purpose earth shall include all soils and any other material to be excavated.
- .2 Soil: All loose or moderately cohesive organic or inorganic deposits of the earth's crust such as silt, sand, gravel or clay or any of their mixtures.
- .3 Topsoil:
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Material reasonably free from subsoil, clay lumps, brush, objectionable weeds, and other litter, and free from cobbles, stumps, roots, and other objectionable material larger than 25 millimeters in any dimension.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Unshrinkable fill: very weak mixture of cement, concrete aggregates and water that resists settlement when placed in utility trenches, and capable of being readily excavated.

1.4 INCLUSIONS

- .1 Costs associated with the work described in this section must be included in the general lump sum portion of the contract under the fixed price item "Approach Road Works". It shall not be measured.

1.5 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit for review by Departmental Representative proposed dewatering methods as described in PART 3 of this Section.
- .3 Submit to Departmental Representative Quality Control test results for granular backfill material. Tests to be completed in accordance with the requirements of the CCDG.
- .4 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, location plan of relocated and abandoned services, as required.

1.6 QUALITY CONTROL

- .1 Keep design and supporting data on site.
- .2 Do not use soil material until written report of soil test results are reviewed by Departmental Representative.
- .3 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
- .4 Certificates of Conformance shall be required for:
 - .1 Open cut excavations (excavating not requiring temporary protection systems).
 - .2 Excavation for backfill and frost tapers.

1.7 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.
- .2 Divert excess aggregate materials from landfill to local quarry for reuse as directed by Departmental Representative.

1.8 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work establish location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

- .3 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
- .4 Prior to beginning excavation Work, notify applicable authorities having jurisdiction establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - .1 Confirm locations of buried utilities by careful test excavations.
 - .2 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
 - .3 Record location of maintained, re-routed and abandoned underground lines.
 - .4 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, bollards, 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 satisfaction of the Departmental Representative.
 - .3 Where required for excavation, cut roots or branches as directed by Departmental Representative.

Part 2 Products

2.1 MATERIALS

- .1 Granular:
 - .1 All granular backfill to structure shall be in accordance with CCDG.
 - .2 Granular material to be MG-20 as specified on the Contract Drawings.
- .2 Insulation: Expanded polystyrene rigid insulation.
- .3 Unshrinkable fill: proportioned and mixed to provide:
 - .1 Maximum compressive strength of 0.4 MPa at 28 days.
 - .2 Maximum cement content of 25 kg/m³ with 40% by volume fly ash replacement: to CSA-A3001, Type GU.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CSA-A23.1/A23.2.
 - .5 Cement: Type GU.
 - .6 Slump: 160 to 200 mm.

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 and requirements of authorities having jurisdiction, whichever is more stringent.
- .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.

3.2 SITE PREPARATION

- .1 Remove obstructions, ice and snow, as required, 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 in accordance with Section 02 41 13 - Selective Site Demolition.

3.3 PREPARATION/ PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.
- .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 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 required to remain undisturbed.

3.4 STOCKPILING

- .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 DEWATERING

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative's review approval details of proposed dewatering methods.
- .3 Protect open excavations against flooding and damage due to surface run-off.
- .4 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to

approved collection runoff areas and in manner not detrimental to public and private property, or portion of Work completed or under construction.

- .1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.6 EXCAVATION

- .1 Advise Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.
- .2 Excavate to lines, grades, elevations and dimensions as indicated in the contract documents.
- .3 Existing adjacent roadways to remain in service. Do not damage and make good any corrective action further to excavation / construction activities.
- .4 Remove concrete, masonry, paving, sidewalks, bollards, rubble and other obstructions encountered during excavation in accordance with Section 02 41 13 – Selective Site Demolition.
- .5 Excavation must not interfere with bearing capacity of adjacent foundations.
- .6 Do not disturb soil within branch spread of trees or shrubs that are to remain.
 - .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .7 For trench excavation, unless otherwise authorized by Departmental Representative in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .8 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .9 Dispose of surplus and unsuitable excavated material off site.
- .10 Do not obstruct flow of surface drainage or natural watercourses.
- .11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .12 Notify Departmental Representative when bottom of excavation is reached.
- .13 Correct unauthorized over-excavation as follows:
 - .1 Fill with MG-56 compacted to not less than 95% of corrected Standard Proctor maximum dry density.
- .14 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.

3.7 BACKFILLING

- .1 Vibratory compaction equipment: Shall be by hand operated vibratory type compaction equipment having power output no greater than 7.5 kilowatts.
- .2 Do not proceed with backfilling operations until completion of following:
 - .1 Departmental Representative has inspected and approved of construction below

finish grade.

- .2 Removal of concrete formwork.
- .3 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .4 Do not use backfill material which is frozen or contains ice, snow or debris.
- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Install expanded polystyrene rigid insulation in backfill as indicated in the contract documents.
- .7 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 0.5 m.
- .8 Place unshrinkable fill in areas as indicated.
- .9 Consolidate and level unshrinkable fill with internal vibrators.

3.8 RESTORATION

- .1 Upon completion of work, remove waste materials and debris in accordance to Section 01 74 21 – Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects to the satisfaction of the Departmental Representative.
- .2 Replace topsoil and sod where existing prior to the commencement of any work.
- .3 Reinstall all existing features to condition which existed before commencement of work, to the satisfaction of the Departmental Representative.
- .4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION