

**PART 1 - GENERAL**

1.1 RELATED SECTIONS

- .1 Section 013543 – Environmental Procedures
- .2 Section 013595 – Archaeological Procedures
- .3 Section 310099 - Earthwork for Minor Works
- .4 Section 310516 – Aggregate Materials
- .5 Section 330513– Manholes and Catchbasin Structures  
Adjusments

1.2 BASIS FOR PAYMENT

- .1 Item No. C-004: Exacavtion and Removal of Soils - The work shall include excavating, hauling, handling, and placing, shaping, compacting, and trimming of earth required for stripping and parking lot widening. Measurement for payment will be volume in cubic metres measured in its original position based on cross sections taken prior to excavation and theoretical limits designated in the Contract. The unit price bid shall be full compensation for all labour, equipment and material required to do the work including excavation, hauling, trimming and disposal of excess material.
- .2 Item No. C-006: Removal of Concrete Curb - The work shall include the removal of concrete curb and gutter as indicated on the Contract Drawings, the construction of a smooth joint at the concrete curb to remain in place and the disposal of the removed curb. Measurement for payment shall be the horizontal length of concrete curb removed in metres. The unit price bid shall be full compensation for all labour, equipment and material necessary to do the work including disposal as required.
- .3 Item No. C-007: Removal of Precast Concrete Curb - The work shall include the removal, salvage and stockpiling of precast concrete curb sections / units as indicated on the Contract Drawings. Measurement for payment shall be by each section / unit of curb actually removed. The unit price bid shall be full compensation for all labour, equipment and material necessary to do the work.
- .4 Item No. C-013: Removal of Concrete Sidewalk - The work shall include the removal of concrete sidewalk as indicated on the Contract Drawings, including the saw-cutting of the concrete sidewalk to ensure a smooth joint at the concrete sidewalk to remain in place and the disposal of the removed sidewalk. Measurement for payment shall be the area of concrete sidewalk removed in square metres. The unit price bid shall be full compensation for all labour, equipment and material necessary to do the work including disposal as required.
- .5 Item No. C-014: Removal of Asphalt Sidewalk - The work shall include the removal of asphalt sidewalk as indicated on the

Contract Drawings, including the saw-cutting of the asphalt sidewalk to ensure a smooth joint at the asphalt sidewalk to remain in place and the disposal of the removed sidewalk. Measurement for payment shall be the area of asphalt sidewalk removed in square metres. The unit price bid shall be full compensation for all labour, equipment and material necessary to do the work including disposal as required.

- .6 Item No. C-015: Removal & Salvage of Granite Curb - The work shall include the removal of existing granite curbs as indicated on the Contract Drawings. The existing granite curbs shall be removed, salvaged and stockpiled as directed by the Departmental Representative. Measurement for payment shall be the horizontal length of granite curb removed in metres. The unit price bid shall be full compensation for all labour, equipment and material necessary to do the work as required.
- .7 Item No. C-016: Removal & Salvage of Concrete Slab Pavers - The work shall include the removal of existing concrete slab pavers as indicated on the Contract Drawings. The existing concrete slab pavers shall be removed, salvaged and stockpiled as directed by the Departmental Representative. Measurement for payment shall be the area of concrete slab pavers removed in square metres. The unit price bid shall be full compensation for all labour, equipment and material necessary to do the work as required

### 1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
  - .1 ASTM C 117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
  - .2 ASTM C 136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
  - .3 ASTM D 422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.
  - .4 ASTM D 698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>3</sup>) (600 kN-m/m<sup>3</sup>).
  - .5 ASTM D 1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft<sup>3</sup>) (2,700 kN-m/m<sup>3</sup>).
  - .6 ASTM D 4318-05, 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 International)
  - .1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 DEFINITIONS

- .1 CSA-A3001-03, Cementitious Materials for Use in Concrete.
  - .2 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.
- .1 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 not classified as rock.
  - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.
- .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 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 Unsuitable materials:
- .1 Weak, chemically unstable, and compressible materials.
  - .2 Frost susceptible materials:
    - .1 Fine grained soils with plasticity index less than 10 when tested to ASTM D 4318, and gradation within limits specified when tested to ASTM D 422 and ASTM C 136: Sieve sizes to CAN/CGSB-8.1.
    - .2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.
- .8 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.
- 1.5 ACTION AND INFORMATIONAL SUBMITTALS
- .1 Make submittals in accordance with Section 013300 - Submittal Procedures.

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- .2 Quality Control: in accordance with Section 014500 - Quality Assurance:
    - .1 Submit condition survey of existing conditions.
    - .2 Submit for review by Departmental Representative proposed dewatering and heave prevention methods.
    - .3 Submit to Departmental Representative written notice at least 5 days prior to excavation work, to ensure cross sections are taken.
    - .4 Notify Departmental Representative when bottom of excavation is reached.
    - .5 Submit to Departmental Representative testing results and report.
  
  - .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 relocated and abandoned services, as required.
  
  - .4 Samples:
    - .1 Submit samples in accordance with Section 013300 - Submittal Procedures.
    - .2 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill and unshrinkable fill materials and provide access for sampling.
    - .3 At least 4 weeks prior to beginning Work, inform Departmental Representative source of fly ash and submit samples to Departmental Representative.
      - .1 Do not change source of Fly Ash without written approval of Departmental Representative.
- 1.6 QUALITY ASSURANCE
- .1 Qualification Statement: submit proof of insurance coverage for professional liability.
  
  - .2 Where Departmental Representative is employee of Contractor, submit proof that Work by Departmental Representative is included in Contractor's insurance coverage.
  
  - .3 Submit design and supporting data at least 2 weeks prior to beginning Work.
  
  - .4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Ottawa, Canada.
  
  - .5 Keep design and supporting data on site.
  
  - .6 Engage services of qualified professional Engineer who is registered or licensed in Province of Ontario, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

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- .7 Do not use soil material until written report of soil test results are reviewed and approved by Departmental Representative.
  - .8 Health and Safety Requirements:
    - .1 Do construction occupational health and safety in accordance with Section 013529.06 - Health and Safety Requirements.
  - 1.7 WASTE MANAGEMENT AND DISPOSAL
    - .1 Separate waste materials for reuse in accordance with Section 017421 - Construction/Demolition Waste Management and Disposal.
    - .2 Divert excess aggregate materials from landfill to local quarry for reuse.
  - 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 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
      - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
      - .5 Prior to beginning excavation Work, notify authorities, including Departmental Representative, and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during Work.
      - .6 Confirm locations of buried utilities by careful soil hydrovac methods.
      - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
      - .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing. Costs for such Work to be paid by Contractor.
      - .9 Record location of maintained, re-routed and abandoned underground lines.
      - .10 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 as directed by Departmental Representative.

- .3 Where required for excavation, cut roots or branches as directed by Departmental Representative in accordance with Section 320190.33 - Tree and Shrub Preservation.

**PART 2 - PRODUCTS**

2.1 MATERIALS

- .1 Type 1 and Type 2 fill: properties to Section 310516 - Aggregate Materials and the following requirements:
  - .1 Crushed, pit run or screened stone, gravel or sand.
  - .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1.

**PART 3 - EXECUTION**

3.1 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.

3.2 PREPARATION / PROTECTION

- .1 Protect existing features in accordance with 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.

3.3 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.

3.4 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative's approval 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 in accordance with Section 013543 - Environmental Procedures to approved 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.

3.5 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.
- .3 Remove concrete, paving, walks, curbs and other obstructions encountered during excavation as indicated
- .4 Excavation must not interfere with bearing capacity of adjacent foundations.
- .5 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.
- .6 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.
- .7 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .8 Restrict vehicle operations directly adjacent to open trenches.
- .9 Dispose of surplus and unsuitable excavated material in approved location 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 Obtain Departmental Representative approval of completed excavation.
- .14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .15 Correct unauthorized over-excavation as follows:
  - .1 Fill under bearing surfaces and footings with Granular 'B' Type II fill compacted to not less than 100% of corrected Standard Proctor maximum dry density.
  - .2 Fill under other areas with Granular 'B' Type II fill compacted to not less than 95 % of corrected Standard Proctor maximum dry density.
- .16 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.
- 3.6 FILL TYPES AND COMPACTION .1 Use types of fill as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D 698 / ASTM D 1557.
  - .1 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill to underside of slab. Compact base course to 100 %.
- 3.7 BEDDING AND SURROUND OF UNDERGROUND SERVICES .1 Place and compact granular material for bedding and surround of underground services.
  - .2 Place bedding and surround material in unfrozen condition.
- 3.8 BACKFILLING .1 Vibratory compaction equipment.
  - .2 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.
  - .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 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.

3.9 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 017421 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Replace topsoil as indicated.
- .3 Reinstate lawns to elevation which existed before excavation.
- .4 Reinstate pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .6 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

**\*\*\* END OF SECTION \*\*\***