

Part 17 General

17.1 References

- .1 Drawing C5 UXO Clearance Areas.
- .2 Canadian Environmental Protection Act (CEPA)
- .3 Federal and Provincial Erosion and Sediment Control Guidelines
- .4 Ammunition and Explosives Instruction #06 - Removal of Hard Targets
- .5 B-GL-381-003/TS-000 Range Clearance and Unexploded Explosive Ordnance (UXO) Activities Manual
- .6 A-LM-007-014/AG-001 Canadian Forces Supply Manual
- .7 Specification Section 02 61 21 - MEC Construction Support & Avoidance
- .8 Specification Section 02 61 24 - MEC Handling
- .9 Halifax Regional Municipality Bylaw L-200 and S-600
- .10 Halifax Regional Municipality Bylaw C-40
- .11 Halifax Regional Municipality Administrative Order #27

17.2 Definitions

- .1 Screening is defined as the separation of fill material into the following categories: boulders greater than 30cm in size, coarse material ranging from 50 to 300 mm and fines less than 50 mm.
- .2 The Engineer is defined as the contracted Engineer responsible for the planning of the pad ready construction.

Part 18 Products

18.1 Materials

- .1 Geotextile Fabric (woven or non-woven) plastic fabric.

Part 19 Execution

19.1 Preparation

- .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, requirements of authorities having jurisdiction, sediment and erosion control drawings, sediment and erosion control plan, specific to site, that complies with CWSR Erosion and Sediment Control For Construction Sites or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Installation activities requiring penetration of the ground surface require UXO avoidance services in accordance with Specification Section 02 61 21 - MEC Construction Support & Avoidance.

19.2 Excavation

- .1 Identify required lines, levels, contours, and datum.
- .2 Protect trees and shrubs that are to remain as a portion of final landscaping.
- .3 Protect adjacent structures, foundations, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.
- .4 Excavation activities require UXO Construction Support Services in accordance with Specification Section 02 61 21 - MEC Construction Support & Avoidance.
- .5 Clear or locate an area sufficient to stockpile screened material. This area must be determined to be free from anomalies using the same instrument that will be used to inspect the screened soil during the Quality Control process.
- .6 Remove surface and partially buried rocks from Area 2 depicted in Reference .1 as directed by the engineer and to a sufficient degree to allow for a Geophysical Survey.

- .7 Excavate Area 1 to original grade (undisturbed natural soil) or bedrock as determined by the Engineer. Area 1 is depicted in D02, Site Plan for Consultant Services, Support for UXO Clearance, Burnside Industrial Park, Dartmouth Nova Scotia, DCC Project No. NS137459, Contract No. 54345.
- .8 Protect bottom of excavations from excessive traffic.
- .9 Stockpile excavated material prior to screening. Once the excavated material has been screened and subject to a minimum of a 10% quality control inspection; it can be removed from the site or kept on site for future construction purposes on that site; this will be determined by the Engineer.
- .10 3.2.6 - 3.2.9 may be conducted in a concurrent or sequential manner as long as the integrity and quality of the tasks has not been compromised.

19.3 Screening & Separation

- .1 All fill material in Area 1 must be screened. Total volume expected is approximately 18,000 m³. Refer to D02, Site Plan for Consultant Services, Support for UXO Clearance, Burnside Industrial Park, Dartmouth Nova Scotia, DCC Project No. NS137459, Contract No. 54345 for details.
- .2 Screened, metallic, coarse material must be handled in accordance with Specification Section 02 61 24 - MEC Handling
- .3 Remove all metallic and other debris materials from fill in accordance with the above references. Non-Munitions Scrap (NMS) will be disposed of at an off-site location in accordance with the above references.
- .4 Screened material may be stockpiled on site in area designated. However screened material may also be disposed of at a location which meets the requirements set-out in Halifax Regional Municipality Bylaw L-200 and S-600 at minimum.

19.4 Quality Control

- .1 Implementation of a quality control process is required for excavation and screenings tasks. At minimum 10% of the total screened volume will be inspected using the same detection method used to initially located targets in the soil.
- .2 Owner appointed third party may be engaged to conduct additional quality control checks.

END

PART 1 - GENERAL

PART 1 - GENERAL

- | | | |
|---------------------|----|---|
| 1.1 Related Work | .1 | Section 31 23 10 - Type 1 and Type 2 Fill |
| 1.2 Source Approval | .1 | Inform Department Representative of proposed source of aggregates and provide access for sampling at least 4 weeks prior to commencing production. |
| | .2 | If, in opinion of Department Representative, aggregate from the proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that aggregate from source in question can be processed to meet specified requirements. |
| | .3 | Should a change of aggregate source be proposed during work, advise Department Representative 4 weeks in advance of proposed change to allow sampling and testing. |
| | .4 | Acceptance of an aggregate at source does not preclude future rejection if it is subsequently found to lack uniformity, or if it fails to conform to requirements specified, or if its field performance is found to be unsatisfactory. |
| 1.3 Sampling | .1 | Submit samples in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Allow continual sampling by Department Representative during production. |
| | .3 | Provide Department Representative with access to source and processed material for sampling. |
| | .4 | Install sampling facilities at discharge end of production conveyor, to allow Department Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by Department Representative to permit full cross section sampling. |
| | .5 | Pay cost of sampling and testing of aggregates which fail to meet specified requirements. |

- 1.4 Measurement for Payment .1 No measurement for payment will be made under this section.

PART 2 - PRODUCTS

- 2.1 Materials .1 Aggregate quality: sound, hard, durable aggregate free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, or other substances that would act in a deleterious manner for the use intended.
- .2 Flat and elongated particles of coarse aggregate: to ASTM D4791.
- .1 Greatest dimension to exceed three times least dimension.
- .3 Fine aggregate satisfying requirements of applicable section to be one, or a blend of following:
- .1 Natural sand
- .2 Manufactured sand
- .3 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
- .4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
- .1 Crushed rock
- .2 Gravel and crushed gravel composed of naturally formed particles of stone.
- .3 Light weight aggregate, including slag and expanded shale.

PART 3 - EXECUTION

- 3.1 Development of Aggregate Source .1 Prior to excavating materials for aggregate production, clear and grub area to be worked, and strip unsuitable surface materials. Dispose of cleared, grubbed and unsuitable materials as directed by Department Representative.
- .2 Where clearing is required, leave a screen of trees

between cleared area and roadways as per the Guidelines.

- .3 Clear, grub and strip area ahead of quarrying or excavating operation sufficient to prevent contamination of aggregate by deleterious materials.
- .4 When excavation is completed dress sides of excavation to nominal 1.5:1 slope, and provide drains or ditches as required to prevent surface standing water.
- .5 Trim off and dress slopes of waste material piles and leave site in neat condition.

3.2 Stripping of Topsoil

- .1 Commence topsoil stripping of areas as indicated by the Guidelines and as directed by the Department Representative.
- .2 Avoid mixing topsoil with subsoil.
- .3 Stockpile in locations as indicated by the Guidelines. Stockpile height not to exceed 2 metres.

3.3 Processing

- .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
- .2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Department Representative.
- .3 Wash aggregates, if required to meet specifications. Use only equipment approved by Department Representative
- .4 When operating in stratified deposits use excavation equipment and methods that will produce uniform, homogeneous aggregate.

3.4 Handling

- .1 Handle and transport aggregates to avoid segregation, contamination and degradation.

3.5 Stockpiling

- .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Department

- Representative. Do not stockpile on completed pavement surfaces.
- .2 Stockpile aggregates in sufficient quantities to meet project schedules.
 - .3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.
 - .4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into work.
 - .5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.
 - .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Department Representative within 48 hours of rejection.
 - .7 Stockpile materials in uniform layers of thickness as follows:
 - .1 Maximum 1.5 metres for coarse aggregate and base coarse aggregate.
 - .8 .1 Maximum 1.5 metres for other aggregate.
 - .2 Maximum 1.5 metres for fine aggregate and sub-base aggregate.
 - .9 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.
 - .10 Do not cone piles or spill material over edges of piles.
 - .11 Do not use conveying stackers.
 - .12 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

- 3.6 Aggregate Stockpile Cleanup
- .1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.
 - .2 Leave any unused aggregates in neat compact stockpiles as directed by Department Representative.
- 3.7 Source Abandonment
- .1 For temporary or permanent abandonment of aggregate source, rehabilitate source to condition meeting requirements of the Guidelines.

END

PART 1 - GENERAL

- | | | |
|--------------------------------------|----|--|
| 1.1 Description of Work | .1 | Complete clearing and grubbing required, and summarized but not restricted, to:

.1 Removal of growth and vegetation within limits of embankment fills, parking lot expansion, site development etc. except for those areas designated to be protected.

.2 Removal of vegetation, stumps, roots and debris from the site. |
| 1.2 Definitions | .1 | Clearing consists of cutting off trees and brush vegetative growth to not more than a specified height above ground and disposing of felled trees and surface debris. |
| | .2 | Underbrush clearing consists of removals from treed area of undergrowth, deadwood and disposing of all fallen timbers and surface debris. |
| | .3 | Grubbing consists of excavation and disposal of stumps, roots, boulders and rock fragments to not less than a specified depth below original ground surface. |
| 1.3 Related Work Specified Elsewhere | .1 | Section 01 35 43 - Environmental Protection |
| | .2 | Section 31 23 10 - Excavating and Backfilling |
| 1.4 Protection | .1 | Subsurface investigation report is available from Department Representative. |
| | .2 | Prevent damage to fencing, landscaping, natural features, bench marks, existing buildings, existing pavement, utility lines, site appurtenances, water courses, which are to remain. Make good damage. |

PART 2 - PRODUCTS

- | | | |
|--------------------|----|-----------------|
| 2.1 Not Applicable | .1 | Not Applicable. |
|--------------------|----|-----------------|

PART 3 - EXECUTION

- 3.1 Preparation and Protection .1 Before commencing Work, ensure in examination of the site that the following are known in particular:
- .1 Methods and means available for material handling, disposal, storage and transportation.
 - .2 Conformation and configuration of ground surfaces.
 - .3 Character, quality and quantity of growth on site.
- .2 Review work to be performed in all its details at the site. Do not proceed without approval of Department Representative.
- .3 Protect existing areas of the site which are to remain uncleared or undisturbed by encircling with Surveyors tape.
- .4 Immediately repair damage to structures, buried and above-ground services, bench marks, and survey monuments should it occur as a result of Work of this Section.
- 3.2 Clearing .1 Clear trees, shrubs, uprooted stumps and surface debris not designated to remain. Obtain approval from Department Representative of limits of Work before beginning clearing.
- .2 Cut off trees, brush, and scrub as indicated or as directed at a height of not more than 300 mm above ground.
- 3.3 Grubbing .1 Grub out stumps and roots to not less than 450 mm below original ground surface.
- .2 Grub out visible rock fragments and boulders, greater than 150 mm in greatest dimension.
- 3.4 Removal and Disposal .1 Remove from the site daily all materials and debris resulting from Work this Section except as noted.
- .2 Do not burn or bury any debris on site.

.3 Usable timber becomes property of Contractor.

3.5 Finished Surface .1 Leave ground surface in a condition suitable for
immediate grading operations and stripping of
topsoil.

END

PART 1 - GENERAL

- 1.1 Work Included
- .1 This section specifies requirements for furnishing all materials, labour, tools and equipment and performing all operations necessary to complete excavation of all types of material encountered, placing of processed excavated material and/or imported structural fill as backfill, disposal of unsuitable and surplus material and furnishing backfill material as specified below, all as shown on the drawings and as specified.
 - .2 The work generally includes, but is not limited to the following items:
 - .1 Excavation and backfilling as shown on the drawings.
 - .2 Control of water by dewatering.
 - .3 Clearance for unexploded ordnances (uxo) as described herein.
 - .4 Removal and disposal of surplus and/or unsuitable materials off site.
 - .5 Removal of organics and topsoil within the fill area.
 - .6 Sheeting, shoring and bracing to support trench walls, sides of excavation, existing structures or utilities.
 - .7 Placement of Type 1 and/or Type 2 fill.
 - .3 The volume of material to be excavated has been estimated at 17,500 m³ (in place volume). The contractor should confirm these volumes. It is estimated that once processed, with removal of inevitable and deleterious materials and processing to meet the requirement of NSTIR Type 2 material that the fill volume will be in the order of 10,500 m³ (compacted in place).

1.2 Related Sections

- .1 Section 02 61 20 - Geophysical Survey
- .2 Section 02 61 21 - MEC Construction Support and Avoidance.
- .3 Section 02 61 22 - MEC Surface Clearance
- .4 Section 02 61 23 - MEC Sub-Surface Clearance
- .5 Section 02 61 24 - MEC Handling (10, Disposal, Screening, Storage, Transportation)
- .6 Section 31 00 01 - Site Earthwork

1.3 References

- .1 ASTM C117-90. Test Method for Material Finer Than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136-84a. Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D698-91. Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m³).

1.4 Definitions

- .1 Excavation: excavation of materials of whatever nature including dense tills, hardpan, frozen materials, boulders, bedrock, debris and all other materials encountered on the site.
- .2 Selected Backfill: excavated on-site material suitable for grading work.

1.5 Protection of Existing Features

- .1 Existing buried utilities and structures:
 - .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed. Carry out test digs as required to locate services, etc.

1.6 Shoring and

- .1 Comply with Section 01 35 28 Health and Safety

- Bracing
- Bracing Requirements and applicable local regulations.
- .2 Provide shoring and bracing as required to prevent movement, failure or settlement, to safeguard and maintain integrity of structures, utilities, earth, benchmarks, services and adjacent grades.
- .3 Engage services of qualified Professional Engineer registered in the Province of Nova Scotia to inspect and approve shoring equipment required for work.
- 1.7 Samples
- .1 When requested submit samples in accordance with Section 01 33 00 - Submissions / Shop Drawings.
- .2 At least 4 weeks prior to commencing work, inform Department Representative of proposed source of bedding, backfill or cover materials and provide access for sampling.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Type 1 Fill
- Imported material shall meet the requirements of NSTIR Type 2 crushed rock (Division 3 Granular Materials, Standard Specifications Manual).
- .2 Type 2 Fill
- Material manufactured from on-site fill material. Material to be crushed and screened using the site rock fill once the miscellaneous and deleterious materials are removed and the material has undergone UXO clearance. Materials to be removed prior to processing for Type 2 Fill include; metals, organics, uxo's, and all other materials smaller than 0.3 metres in diameter.
- Material to meet requirements of NSTIR Type 2 Crushed Rock Manufactured.

PART 3 - EXECUTION

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

- .2 Ensure clearing and grubbing on side slopes is complete prior to excavation for embankment widening.

3.2 Stockpiling

- .1 Stockpile fill materials in areas designated by Department Representative. Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.

3.3 Shoring and Bracing

- .1 Construct temporary works to depths, heights and Bracing locations as indicated or directed by the Professional Engineer responsible for the design of the shoring or bracing.
- .2 During backfill operation:
 - .1 Unless otherwise indicated or as directed by Department Representative, remove sheeting and shoring from excavations.
 - .2 Do not remove bracing until backfilling has reached that specified by the Professional Engineer responsible for the design of the shoring or bracing.
 - .3 Pull sheeting in increments that will ensure compacted backfill is maintained at an elevation at least 500 mm above toe of sheeting.
- .3 When sheeting is required to remain in place, cut off tops at elevations as directed by Department Representative.
- .4 Upon completion of substructure construction:
 - .1 Remove shoring and bracing.
 - .2 Remove excess materials from site and restore conditions indicated or as directed by Department Representative.

3.4 Dewatering

- .1 Conduct dewatering operations in accordance with Section 01 35 44 - Environmental Protection.
- .2 Keep excavations free of water while work is in progress.

- .3 Protect open excavations against flooding and damage due to surface run off.
- .4 Dispose of water in a manner not detrimental to public and private property, or any portion of work completed or under construction.

3.5 Excavation

- .1 Carry out excavations and removals. Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove rubble and other obstructions encountered during excavation.
- .3 For trench excavation, unless otherwise authorized by Department Representative in writing, do not excavate more than 30 metres of trench in advance of installation operations and do not leave open more than 10 metres at end of days operation.
- .4 Dispose of surplus and unsuitable excavated material in approved location off site in accordance with Nova Scotia Department of Environment regulations.
- .5 Do not obstruct flow of surface drainage.
- .6 Earth bottoms of excavations to be solid undisturbed soil, level, free from loose, soft or organic matter.
- .7 Notify Department Representative when soil at bottom of excavation appears unsuitable and proceed as directed by Department Representative.
- .8 Obtain Department Representatives approval of completed excavation.
- .9 Remove unsuitable material from trench bottom to extent and depth as directed by Department Representative.
- .10 Where required due to unauthorized over excavation, correct as follows:
 - .1 Fill under bearing surfaces and footings with approved structure fill compacted to 100% Standard

Proctor Dry Density.

.2 Fill under other areas compacted to a minimum of 95% Maximum Dry Density.

- .11 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.
- .12 Obtain excavation permit prior to starting any on-site excavations.

3.6 Fill Types and
Compaction

- .1 Use fill of types as indicated or specified below. Compaction densities are percentages of maximum densities obtained from ASTM D698.
- .2 For pipes, cables, ducts, fittings and appurtenances, install bedding as follows: Provide min. 150 mm bedding layer of bedding sand under pipes, cables, ducts, fittings and appurtenances. Compact to 95% of Maximum Dry Density. Side fill to top of utility or service manually with beddings and in uniform lifts not exceeding 150 mm. Hand tamp only.
- .3 Backfill: Compact to 95% of Maximum Dry Density.
- .4 Notify Department Representative four hours prior to backfilling of trenches.

3.7 Backfilling

- .1 Do not proceed with backfilling operations until Department Representative has inspected and approved installation.
- .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 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.

.5 Place layers simultaneously on both sides of installed work to equalize loading. Difference not to exceed 225 mm.

.6 Where earth pressures are liable to develop permit concrete to cure for minimum 28 days to withstand earth and compaction pressures. Do not install earth or backfill until concrete has cured completely.

.7 Place protective material layer under, around and over minor installations until 600 mm of cover is provided. Dumping material directly on installations will not be permitted.

.8 Place backfill materials of earth fill around structure in uniform layers not exceeding 200 mm compacted thickness up to finish grade. Compact each layer replacing succeeded layer.

.9 Where new services cross under existing services, compact bedding for existing service pipe to 150 mm below bottom of pipe and provide a cast-in-place cradle for length of unsupported pipe.

3.8 Inspection and Testing

.1 The Contractor shall submit gradation curves for proposed materials to demonstrate compliance with specifications. Pay all costs for gradation curves.

.2 Testing of materials and compaction will be carried out by testing laboratory designated by Department Representative. Frequency of tests will be determined by Department Representative.

.3 Department Representative will pay costs for initial inspection and testing. Refer to Section 01 45 00 - Testing Laboratory Services.

.4 Where tests or inspections by designated testing laboratory reveal work not in accordance with contract requirements, Contractor shall pay costs for additional tests or inspections as Department Representative may require to verify acceptability of corrected work.

- 3.9 Restoration
- .1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects noted by Department Representative.
 - .2 Clean and reinstate areas affected by work as directed by Department Representative.

END
