Technical Appendices

Appendices Issued for Information Only

END OF SECTION

Drawing No.	Title
C00	Cover Sheet
C01	Aerial View: Area of Proposed Work
C02	Overview of Proposed Works
C03	Existing Ground Levels, Proposed Embankments and Surface Ditches and Swales
C04	Proposed Landfill Embankment and Road Embankment Contours'
C05	Landfill Embankment Sections 0-0', 1-1' and 2-2'
C06	Landfill Embankment Sections 3-3', 4-4' and 5-5'
C07	Landfill Embankment Sections 6-6', 7-7', 8-8'
C08	Details North End Landfill Embankment Plan and Sections
C09	Road 'A' ProposedCentre Line Profile
C10	Landfill Surface Cap Proposed Profile and Roadside Ditch Profile
C11	Roads 'A' and 'B' – Sections

END OF SECTION

Part 1 GENERAL

1.1 INTRODUCTION

.1 The following Section summarizes the work required during the remediation program of one area of scattered metal debris (AEC-1) one former vehicle storage area (AEC-2), and one former metal dump/community landfill (AEC-3) referred to as Main Landfill, located at Iqaluit, Nunavut (the Site). It is anticipated that all work described herein will be completed under this contract. However, the owner reserves the right to add to or remove some of the proposed work as described herein.

1.2 SITE LOCATION

.1 Iqaluit (formerly named Frobisher Bay) is located on the southern tip of Baffin Island. The Iqaluit Former Metal Dump/Community Landfill (UTM coordinates of E521904.94, N7067812.69) is located at the West 40 area on the border of Sylvia Grinnell Territorial Park and the Sylvia Grinnell River, 1.7 km southwest of the City of Iqaluit. Historically, the site has been referred to as Sylvia Grinnell Park Dump and West 40 – Dump Site #1 and Vehicle Dump and Community Landfill or simply "Site" or "Landfill".

1.3 SITE ACCESS

.1 The Site accessible from the municipal roads of the city. Access to the three (3) areas of environmental concern (AECs) requiring remedial work is provided by single track dirt/gravel service roads running from the city. There is no direct access road to the base of the slope of the Solid Waste Landfill (AEC-3). Refer to Drawing C01. The proposed works include the construction of a haul road and ramp to the base of the AEC-3 Main Landfill as shown on the Drawings C02 to C04

.1 Additional temporary roadways may also be required to gain access to the AEC-1 and AEC-2, during construction activities.

1.4 SITE DESCRIPTION

.1 The United States Air Force (USAF) used the Site from between 1955 to 1963 as a metal dump for vehicles, truck bodies, barrels and scrap metal. The majority of materials were deposited in 1963 when the US Military left Frobisher Bay. Shops, buildings, and other materials were simply bulldozed over the cliff. The cliff is a bedrock outcrop rising approximately 30 m above the tidal area where the Sylvia Grinnell River meets Frobisher Bay. The area to the north side of the slope was used by the USAF and to a lesser degree the community of Iqaluit as a landfill site for household garbage until sometime in the 1970's.

.2 Three main areas of waste are present at the Site: 1) the up-gradient partially buried debris area (AEC-1) 2) the vehicle dump located approximately to the south and parallel with the main landfill (AEC-2) and 3) the main landfill area located in the central portion of the site and spanning the top, side and toe of a bedrock escarpment that runs northwest/southeast (AEC-3).

.3 Environmental investigations have been carried out at the site, dating back to 2008. The work has focused on the presence and impacts of petroleum hydrocarbons (PHCs), inorganic elements, pesticides, polycyclic aromatic

hydrocarbons (PAHs) and polychlorinated biphenyls (PCB) contamination in soils, surface water, and sediments.

.4 The site covers an area of approximately 53,000 m^2. The site is situated on an escarpment leading to the Sylvia Grinnell River and has several shallow ravines and coulees partially filled with metal debris. The debris is scattered over a large area and consists of vehicles, equipment, barrels, and scrap metal.

.5 The Phase III ESA (Franz, 2010) identified four areas of environmental (AECs) concern at the site. Only 3 areas are the subject this proposed contract (AEC-1, AEC-2, and AEC-3).

.1 **AEC-1 Upgradient Buried Debris** The area of the Site directly up gradient from the vehicle dump contains buried metal debris identified during the Phase I/II/III ESA completed by Franz (2009, 2010). The presence of debris was confirmed during the Arcadis 2016 supplemental assessment.

.2 **AEC-2 Vehicle Dump:** The area was referred to as the vehicle dump in the Franz (2009, 2010) studies and described as containing vehicles, such as trucks, cars, trailers, boilers, tankers, and other materials. During the Arcadis 2016 supplemental assessment, the area was observed to contain fewer debris as a result of a recycling program. Much of the vehicular debris was removed in 2011 during a community wide recycling program. The contractor involved in that recycling program removed the vehicles, crushed them and shipped them south. The area is located to the east of the main landfill area. A drainage channel runs directly through the center of this debris pile discharging to the ponds, then the River.

.3 **AEC-3 Main Landfill:** The main landfill area consists of a mixture of debris spread across a steep graded bedrock slope. The top of the landfill area has been capped with granular material and the toe is left exposed with debris scattered throughout the area.

1.2 RELATED SECTIONS

.1 All sections of this contract document and drawings.

1.3 REFERENCE DOCUMENTS

.1 Phase I/II Environmental Site Assessment, Vehicle Dump and Community Landfill, Iqaluit, Nunavut (Franz Environmental Inc., March 2009).

.2 Phase III Environmental Site Assessment, Vehicle Dump and Community Landfill, Iqaluit Nunavut (Franz Environmental Inc., March 2010)

.3 Vehicle Dump and Community Landfill, Iqaluit, Nunavut – Ecological and Human Health Detailed Quantitative Risk Assessment (DQRA). (Franz Environmental Inc., March 31, 2010)

.4 Remedial Action Plan, Former Metal Dump and Community Landfill, Iqaluit, Nunavut (Arcadis Canada, 27 January, 2017)

.5 Other supporting documentation may be made available during the bidders meeting.

1.4 DEFINITIONS

.1 Work(s): Scope of work as detailed and described in this Specification and potential additive scope of works under or in conjunction with this Specification.

.2 Site: Former Vehicle Dump and Community Landfill, Iqaluit Nunavut.

.3 Owner: the owner of the Site is the Government of Canada.

.4 Departmental Representative: Directors and/or other employees designated as representatives of and exercising the roles and attributes of Canada under the contract including those personnel authorized by Public Works and Government Services Canada and/or Transport Canada.

.5 Contractor: Firm or representative retained to conduct the Works as per this Specification.

.6 Contractor's Foreman: Contractor's resident site representative, who is authorized to make decisions on behalf of Contractor and will be present at the Site for the duration of the Works.

.7 Provide: For this Specification, the word "provide" means supply and/or install at the cost of the contractor.

.8 AEC-1: Upgradient Debris

.9 AEC-2: Vehicle Dump

.10 AEC-3: Main Landfill

.11 Work Areas: Any area falling within AEC-1, AEC-2, or AEC-3 and surrounding areas and/or any area utilized by the contractor in order to complete the remedial work outlined in the specifications.

.12 Contaminated Soil: All soils indicated within the Contract Documents as exceeding the federal Soil Quality Criteria (Commercial) or as identified by Departmental Representative during the course of the Work.

.13 Waste: Any physical object deposited within any of the work areas whether inert, hazardous or non-hazardous.

.14 Landfill Materials: All non-hazardous or recyclable materials, originating from the former landfills and storage areas (AEC-1 to AEC-3) requiring transport, packaging, segregation and/or storage within the Main Landfill (AEC-3).

.15 Non-Hazardous Waste: Waste materials generated previously placed within the work area. Generally, it includes domestic waste, demolition debris and scrap metal debris. Same meaning as Landfill Waste, Debris, Garbage, Domestic Waste, Metal Debris and Construction Debris.

.16 Buried Waste: Landfill materials that are covered, partially covered or below the surface of the surrounding area and require mechanical equipment to access, uncover, extricate or excavate to be packaged or hauled. Applies to work areas AEC-1, AEC-2, and AEC-3.

.17 Exposed Waste: Landfill materials that are partially covered or landfill materials openly sitting on the ground surface. The materials may or may not require mechanical equipment to access, uncover, extricate or excavate to be packaged or hauled. Applies to AEC-1, AEC-2, and AEC-3.

.18 Hazardous Solid Wastes: Hazardous waste materials that are in a consolidated, solid, encapsulated or powder form and placed within the work area. Generally, it includes transformers, batteries, fire extinguishers, asbestos containing materials and/or pesticides. Same meaning as Hazardous Materials, Designated Substances, Toxic Materials and Toxic Wastes.

.19 Hazardous Fluid Wastes: Hazardous waste materials that are in a liquid,

gaseous, gel-like or colloidal form and placed within the work area. Generally, it includes paint, antifreezes, lubricants, fuels, glycols, ozone depleting substances and/or pesticides. Same meaning as Hazardous Materials, Hazardous Liquids, Designated Substances, Toxic Materials and Toxic Wastes.

.20 Lead Amended Paint Wastes: All painted materials within the Contract Documents as exceeding the territorial Environmental Guideline for Waste Lead and Lead Paint or as identified by Departmental Representative during the course of the Work.

.21 Asbestos-Containing Materials (ACMs): materials identified under Existing Conditions including fallen materials and settled dust.

.22 Top of Landfill: The relatively flat section of the work areas that is located at or above the Top of Slope and includes areas of landfill waste placement and/or soils. Same as Top of Escarpment and Crest of Landfill.

.23 Top of Slope: The highest elevations of the slope. Same as Slope Edge, Nose of Landfill, Crest of the Slope, and Crest of the Landfill Embankment

.24 Toe of Slope: The lowest elevations of the slope. Same as Slope Bottom or Base.

.25 Slope Face: The angled plane of the landfill and/or overburden extending from the Top of Slope to the Toe of Slope. Same as Slope Surface.

.26 Angle of Repose: Steepest angle of the slope face, whilst maintaining the integrity of the slope, surface grade and any nearby features.

.27 Slope Angle: The current, proposed or final gradient of the Slope face measured in three dimensions (3D) and reported as an angle or ratio of horizontal (run) to vertical (rise).

.28 Swale: A engineered linear depression constructed along the Top of Landfill (Upper), Toe of Slope (Lower) and Slope Face to collect and direct surface water flow away from the Landfill Nose towards the bottom of the landfill. Same as drainage ditch, trench.

.29 Solid Hazardous Waste Containers: The intermediate container necessary to contain solid Hazardous Waste Material as required by the Transportation of Dangerous Goods Act and Regulations.

.30 Marine Shipping Container: sea shipping containers with the nominal dimensions of 6.1 m x 2.4 m x 2.6 m (20 feet x 8 feet x 8.5 feet) and the container into which the intermediate containers are placed for the purpose of shipping to a disposal facility.

.31 Temporary Storage Area: The designated area approved by the Departmental Representative for the storage of packaging and/or shipping containers prior to transportation off-site.

.32 Temporary Working Area: A designated area approved by the Departmental Representative for managing waste including segregating, testing, processing, containerizing and stockpiling. Same as “sorting area”, “staging area”.

1.5 DESCRIPTION OF WORK

.1 Work of this Contract comprises a remediation program of a former landfill, a former vehicle storage area and upgradient area where buried debris has been found at Iqaluit, Nunavut; as outlined in these specifications. Description of

all work to be completed at the site as part of the remediation program includes but is not limited to:

.1 Acquire all required permits and approvals to conduct the works. The site custodian will obtain any inter-governmental agency permitting and supply to the successful bidder upon contract award (i.e., Nunavut Impact Review Board and Nunavut Water Board).

.2 Mobilization and demobilization of equipment and personnel to the Site; the nearest area with appropriate lodging facilities in the city of Iqaluit, Nunavut.

.3 Define and setup work areas (i.e. hoarding area, truck turnaround, storage, temporary facilities, etc.).

.4 Mobilize and install temporary utilities, fencing and facilities as specified in the contract documents.

.5 Secure Site as required.

.6 Identify sources of earthworks materials to be utilized and obtain approval of the sources and materials by the Departmental Representative and any other stakeholders.

.7 Complete a detailed topography survey of all work areas (AEC-1, AEC-2, and AEC-3) prior to beginning site work to establish existing conditions.

.8 Excavation, containerization, transport, and off-site disposal of hazardous waste materials and lead-amended painted material to the Departmental Representative Approved Designated Hazardous Waste Disposal or Treatment Facility in Southern Canada or United States of America.

.9 Upgrade access roads or create new access roads to facilitate construction traffic where necessary.

.10 Import, screen as required, and stockpile aggregate material from external sources.

.11 **AEC-1 Remediation – the following work to be included but not limited to:**

.1 Removing approximately 100 m^3 of exposed and/or partially buried non-hazardous metal debris from AEC-1, and hauling it to the Temporary Working Area located north of AEC-1.

.2 Processing non-hazardous metal debris excavated from within AEC-1, including cutting to sizes as indicated in the Contract Documents, and transferring it to the Main Landfill (AEC-3) for final disposal.

.3 Removing approximately 50 m^3 of exposed and/or partially buried hazardous material from AEC-1, and hauling it to the Temporary Working Area where it will be segregated and prepared for shipping to the South to an approved hazard waste disposal/treatment facility.

.4 Excavating and hauling, approximately 400 m^3 of petroleum hydrocarbon (PHC) contaminated soil from AEC-1 to the Temporary Working Area for testing and then transferring it to and disposing it at a Departmental Representative approved disposal facility (Iqaluit Landfarm or other). Excavations to be backfilled with approved granular material.

.5 Excavating and hauling approximately 200 m^3 of metal contaminated soil in AEC-1and depositing it within the Main Landfill (AEC-3) for final disposal. Excavations to be backfilled

with approved granular material.

.6 Removing all tires, batteries and liquids and shipping these to a final disposal facility.

.7 Capping selected areas of AEC-1 with coarse granular fill to prevent erosion and re-grading to redirect surface water away to existing surface water drainage features and to match existing conditions as directed by the Departmental Representative.

.12 **AEC-2 Remediation - the following work to be included but is not limited to:**

.1 Removing approximately 750 m^3 of exposed non-hazardous material from AEC-2, and hauling it to the Temporary Working Area located north of AEC-1.

.2 Processing non-hazardous metal debris excavated from within AEC-2, including cutting to sizes as indicated in Contract Documents, and transferring it to the Main Landfill (AEC-3) for burial and final disposal.

.3 Removing approximately 250 m^3 of exposed and/or partially buried hazardous material, from AEC-2, and hauling it to the Temporary Working Area where it will be segregated and prepared for shipping to the South to an approved hazardous waste disposal/treatment facility.

.4 Excavating and hauling approximately 100 m^3 of PHC contaminated soil from AEC-2 then transferring it to the Temporary Working Area for testing and then transferring it to and disposing it at a Departmental Representative approved disposal facility (Iqaluit Landfarm or other). Excavations to be backfilled with approved granular material.

.5 Excavating and, hauling approximately 100 m^3 of metal contaminated soil from AEC-2 and transferring it to the Main Landfill (AEC-3) for burial and final disposal. Excavations to be backfilled with approved granular material.

.6 Excavating, and hauling approximately 100 m^3 of PCB contaminated sediment from AEC-2 to the Temporary Working Area and then transferring it to a Departmental Representative approved disposal facility. Excavated sediments to be backfilled with approved rip-rap material underlain by geotextile as directed.

.7 Removing all tires, batteries and liquids and shipping these to a final disposal facility.

.8 Capping selected areas disturbed by the soil removal in AEC-2 with coarse granular material to prevent erosion and re-grading it to redirect surface water away to existing surface water drainage features and to match existing conditions as directed by the Departmental Representative.

.13 **AEC-3 Remediation Part I – the following work will be included in the Main Contract**:

.1 Reconstructing the Site access road and constructing a new road and ramp down to the base of the Main Landfill as shown on the contract drawings. This will include grubbing, stripping and rough grading of the ground surface, as and where required; placement and compaction of granular fill; installation of culverts with bedding

and backfill; rerouting existing surface drainage features; and constructing new roadside ditches and swales. Aggregate utilized for ramp construction will be re-used as part of landfill capping at a later point.

.2 Removing and consolidating approximately 1,650m^3 of non-hazardous surface waste scattered throughout the AEC-3, main landfill area and beyond the toe of the landfill in a Temporary Working Area in AEC-3 as directed by the Departmental Representative.

.3 Removing approximately 650 m^3 of exposed and/or partially buried hazardous material from AEC-3 and transferring it to the Hazardous Waste Material Processing Area (north of AEC 1), segregating and preparing it for shipping South to an approved hazardous disposal facility.

.4 Removing all tires, batteries and liquids and shipping these to a final disposal facility.

.5 Processing the estimated 1,500m^3 of non-hazardous wastes including cutting or crushing metal debris to sizes as indicated in contract documents for burial in Zone 1 of the proposed Main Landfill embankment.

.6 Placement and compaction of non-hazardous waste from AEC-1, AEC-2 and AEC-3 in horizontal lifts in Zone 1 of the proposed Main Landfill embankment to the lines and levels shown on the drawings.

.7 Placement of metals impacted soil from AEC 1 and AEC 2 into Zone 1 of the proposed Main Landfill embankment.

.8 Placement and compaction, to the extent possible, of Zone 1 granular fill material on top of each waste lift to infill the voids and stabilize the material and achieve an outer slope of 2H:1V (as per contract documents).

.9 Constructing drainage swales at the bottom and ditches at the top of the Main Landfill and along roads and install a culvert with bedding and backfill as indicated in contract documents. Drainage swales and ditches will be lined with non-woven geotextile material as per contract documents.

.14 **AEC-3 Remediation Part II- the following work will be included in full or in part or not at all at the discretion of the Owner.**

.1 Grubbing, topsoil stripping and rough grading of the ground surface to remove organic matter and soils where Zone 2 embankment materials are to be placed outside the foot print of Zone 1.

.2 Removal of the access ramp from approximately Road ‘A’ chainage 0+200 to 0+350 and re-using the granular materials in Zone 2 the landfill embankment

.3 Placing and compacting of Type 2 fill materials in Zone 2 of the landfill embankment in lifts as indicated in contract documents.

.4 Grading the Zone 2 slope face to a slope angle of generally no steeper than or 2H:1V as indicated in contract documents and as directed by the Departmental Representative.

.5 Placing a non-woven geotextile beneath the Zone 3 Rip Rap material anchored into the Zone 2 fill at elevation 13m.

.15 Work specified herein also includes, but is not limited to, clearance of subsurface and overhead utilities with the appropriate agencies, set up of temporary facilities, permitting, environmental protection and site restoration, submittals, and all related activities to execute the Site remediation and rehabilitation program and related site activities.

.16 All hazardous materials must be packaged in accordance with the contract documents before transporting of the hazardous material to a Departmental Representative approved hazardous waste facility.

.17 Backfill and re-grade excavations using approved aggregate from approved sources.

.18 Re-grade any damaged municipal roads as required at the end of the contract

.19 Complete site survey of all work areas including but not limited to AEC-1, AEC-2, and AEC-3 roads, swales/ditches, and culverts to establish final conditions at the end of the contract.

.20 Work specified herein also includes, but is not limited to: Contractor mobilization/demobilization, set up of temporary facilities, permitting, environmental protection and site restoration, submittals, and all related activities to execute the Works.

.21 All other work identified in these Contract Documents.

1.9 WORK RESTRICTIONS

.1 The overall sequence of work may be completed over a one year contract period including AEC-3 Remediation.

.1 Sequence of work events and scheduling will be at the discretion of the contractor subject to approval of the Owner and the Departmental Representative.

.2 The contractor shall submit as part of the bid documents detailed scheduling, planning, and resource allocation to complete the work. These documents will outline what work is scheduled to be completed in each month.

1.10 OVERALL WORK SEQUENCE

.1 The overall sequence of work to be completed at the site as part of the remediation program is presented below. The following is provided for information purposes only and the contractor may elect to re-order and re-prioritize the exact sequence of events as approved by the Departmental Representative during remedial activities.

.2 Preparation of a Site Health and Safety Plan.

.3 Preparation and submission of detailed work schedules for the contract duration providing details on project schedules and allocation of resources throughout the contract duration.

.4 The contractor may refer to the following suggested sequence of work in order to complete the Work:

.1 Site preparation:

.1 Obtain, at the cost of the contractor any relevant permits/approvals required to complete the work.

.2 Confirm with the Departmental Representative the areas of soil

and sediment remediation and limitations.

.3 Confirm with the Departmental Representative the area for use as temporary storage and staging.

.4 Confirm with the Departmental Representative the extents of the work areas

.5 Mobilize and site set-up and installation of temporary utilities, fencing and facilities.

.2 Survey of all work areas, including but not limited to AEC-1, AEC-2, and AEC- 3 , to establish existing ground levels and conditions including probing to bedrock along the proposed, alignments of ditches and swales

.3 Provide and install environmental protection as outlined in the contract documents.

.4 Consolidation of Landfill Materials: includes the mobilization of equipment, packaging, transport, stockpiling, storage and labelling of non-hazardous and hazardous material as indicated and as directed. This includes the placement of non-hazardous materials within the AEC-3 Main Landfill.

.5 Remediation: Involves mobilization, excavation and transport of equipment to collect, package and store hazardous materials, collect and stockpile surficial non-hazardous materials (AEC-1 and AEC-2) and place within AEC-3. Excavation of PHC contaminated soil in AEC-1 and AEC-2 for disposal at an approved facility, and excavation of metals impacted soil from AEC-1 and AEC-2 and placement into AEC-3 landfill, as per the specifications.

.1 Remove (from AEC-1 and AEC-2), reduce size and consolidate all non-hazardous material into the toe of AEC 3 as outlined in the contract documents.

.2 Excavate all metal impacted soil in AEC-1 and AEC-2 and consolidate into the toe of AEC-3 as outlined in the contract documents.

.3 Staging, sorting, packaging, and shipping of all hazardous materials in AEC-1, AEC-2 and AEC-3 (selected).

.4 Excavation and disposal of PHC impacted soil and sediment to a departmental approved disposal facility (Iqaluit Landfarm or other).

.5 Excavation and disposal of PCB impacted soil and sediment to a departmental approved disposal facility, as on-site capping materials or shipping waste south.

.6 Site survey of final conditions at AEC-1, AEC-2, and AEC-3.

.7 Reinstatement of site, including backfilling using granular fill, as indicated and re-vegetation of the top plateau of AEC-3 and capping at AEC-1 and AEC-2.

.8 Changes in sequence as provided by the Departmental Representative shall be at no extra cost to the Owner.

.9 Demobilization of equipment and reinstatement of the Site (i.e. removal of fencing/temporary facilities, check grading and general housekeeping, final inspection by Departmental Representative and Contractor Foreman).

.5 Maintain fire access/control throughout the contract period.

.6 The contractor is required to restrict site access to the work areas and post tri-lingual signage as per the specifications.

1.11 CONTRACTOR USE OF PREMISES

.1 Access to the project site is given to the Contractor solely and exclusively for the completion of the site remediation work and limited to the work areas and the area reserved for the Contractor and owner access.

.2 Locate staging area to the north of AEC-1 for material storage and parking as approved by Departmental Representative.

.3 Limit use of premises for:

.1 Security.

.2 Health and Safety.

.3 Work.

.4 Access.

.5 Storage.

.4 Access to areas other than the work area is strictly forbidden to the contractor unless so authorized by Departmental Representative in writing.

.5 It is strictly forbidden, except when authorized by Departmental Representative, to conduct excavation outside of the work area. Any soil/material excavated and associated work without the approval of Departmental Representative will become the responsibility of the Contractor who will be responsible for all associated costs to reinstate the impacted area.

.6 No storage/placement of materials and/or equipment is permitted on site outside the work area as approved by Departmental Representative. Co-ordinate use of premises under direction of Departmental Representative.

.7 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

.8 At completion of operations, restore the site, work area and access roads to equal or better than that which existed before new work started.

.9 Given the site's location and the potential for adverse weather conditions, the contractor shall consider fog, frost conditions and snow removal requirements, if encountered, at no extra cost to the Owner.

1.12 EXISTING SERVICES/UTILITIES

.1 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.

.2 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.

.3 Record locations of maintained, re-routed and abandoned service lines.

.4 Construct barriers in accordance with contract documents.

1.13 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy of each document as follows:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Materials/equipment tracking sheets, updated daily. (includes imported/exported materials, chargeable equipment hours)

.5 Meeting minutes.

.6 Reviewed Shop Drawings.

.7 List of Outstanding Shop Drawings.

.8 Change Orders.

.9 Copy of Approved Work Schedule.

.10 Other Modifications to the Contract.

.11 Health and Safety Plan and Other Safety Related Documents.

.12 Other Documents as Specified.

.2 Sources of all materials must be identified in writing to and approved by Departmental Representative prior to contract award and the start of work on site. All information submitted will be subject to verification by Departmental Representative.

Part 2 PRODUCTS

2.1 NOT USED

Part 3 EXECUTION

3.1 NOT USED

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 General Restrictions

.2 Work hours

1.2 RELATED SECTIONS

.1 Section 01 32 16.07 – Construction Schedule

.2 Section 01 33 00 – Submittals

.3 Section 01 35 13 – Special Procedures for Contaminated Sites

.4 Section 01 32 16 – Construction Progress Schedule

1.3 GENERAL RESTRICTIONS

.1 No work of any kind can begin until the proper authorization from the Departmental Representative and/or work permits have been obtained.

.2 Work under this contract is to be distributed into one season.

1.4 HOURS OF WORK

.1 Construction work time, normal hours:

.1 Work hours are to be determined by the contractor, agreed upon and approved by the Departmental Representative, but must not exceed 12 hours per working day.

END OF SECTION

Part 1 General

1.1 DEFINITION

.1 Preconstruction Meeting: meeting to be held prior to Contractor Mobilization via teleconference and to include the Contractor and Departmental Representatives from Public Works and Government Services Canada and Transport Canada.

.2 Progress Meeting: Meeting to be held at weekly intervals during the course of work and to include the Contractor and Departmental Representatives from Public Works and Government Services Canada and Transport Canada.

1.2 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.

.2 Prepare agenda for meetings with the Departmental Representative.

.3 Distribute written notice, via email, of each meeting three days in advance of meeting date to Departmental Representative.

.4 Provide physical space and make arrangements for meetings.

.5 Arrange and provide teleconference service for Departmental Representative, as needed.

.6 The Departmental Representative will preside at meetings.

.7 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties and keep an update copy of meeting minutes on Site.

.8 Reproduce and distribute electronic copies of minutes within three days after meetings and transmit to meeting participants and, affected parties not in attendance.

.9 Representative of Contractor, major Subcontractor(s) and suppliers attending meetings must be qualified and authorized to act on behalf of party each represents.

1.3 PRECONSTRUCTION MEETING

.1 Within 5 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

.3 Establish time and location of meeting and notify parties concerned minimum five days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Submit a preliminary project schedule prior to the preconstruction meeting, within seven contract days after contract award.

.6 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work: in accordance with contract documents.

.3 Schedule of submission of shop drawings, and samples. Submit

submittals in accordance with contract documents.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, and fences in accordance with contract documents.

.5 Site security in accordance with contract documents.

.6 Proposed procedures, approvals required, work day length, work week length and, administrative requirements.

.7 Take-over procedures, acceptance, warranties in accordance with contract documents.

.8 Monthly progress claims, administrative procedures, photographs, hold backs.

.9 Appointment of inspection and testing agencies or firms.

.10 Insurances, transcript of policies.

1.4 PROGRESS MEETINGS

.1 During course of Work and one week prior to project completion, schedule progress meetings weekly or upon request. Frequency of meetings may increase during weeks prior to Project Completion.

.2 As practical, weekly progress meetings should be regularly scheduled for the same day of the work week and time.

.3 Contractor, major Subcontractors involved in Work, a representative of PSPC and Departmental Representative are to be in attendance.

.4 Notify parties of changes to regularly scheduled meetings a minimum two days prior to meetings.

.5 Record minutes of meetings in the form of a weekly progress report and circulate to attending parties and affected parties not in attendance within three days after meeting.

.6 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Corrective measures and procedures to regain projected schedule.

.6 Revision to construction schedule.

.7 Progress schedule, during succeeding work period.

.8 Review submittal schedules: expedite as required.

.9 Health, Safety and Security Issues.

.10 Maintenance of quality standards.

.11 Review proposed changes for effect on construction schedule and on completion date.

.12 Wildlife incidents.

.13 Other business.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Activity: element of Work performed during course of the Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally, Bar Chart should be derived from commercially available computerized project management software.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Minimum of Monday to Friday, inclusive, will provide seven day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission. Weekend/holiday work is at the discretion of the Contractor.

.5 Duration: number of work periods (not including holidays or other non-working periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Master Plan: summary-level schedule that identifies major activities and key milestones.

.7 Milestone: significant event in project, usually completion of major deliverable.

.8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Ensure that all planning pertaining to the following sections take into consideration a contract period.

.3 Plan to complete Work in accordance with prescribed milestones and time frame.

.4 Allow time for progress reporting.

.5 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.3 SUBMITALS

.1 Provide submittals in accordance with Contract Documents.

.2 Submit to Departmental Representative with Quotation submission a Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.3 Submit Project Schedule to Departmental Representative within five working days of receipt of acceptance of Master Plan.

1.4 MASTER PLAN

.1 Structure schedule to allow orderly planning for the project, organizing and execution of Work as Bar Chart (GANTT).

.2 Departmental Representative will review and return revised schedules within five working days of the Award of Contract.

.3 Revise impractical schedule and resubmit within three working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.5 PROJECT SCHEDULE

.1 Develop detailed Master Project Schedule derived from the Master Plan.

.2 Develop a detailed Project Schedule including a critical path analysis, derived from the Master Plan.

.3 Ensure detailed Project Schedules include as minimum milestone and activity types as follows:

- .1 Award of Contract
- .2 Shop Drawings, Samples
- .3 Permits and Approvals
- .4 Mobilization
- .5 Site Activities (expand as required to suit Contractor’s task breakdown)
- .6 Resource allocation
- .7 Final Inspection and Interim Certificate of Completion
- .8 Closeout Submittals
- .9 Demobilization
- .10 Final Certificate of Completion

.4 Contractor must indicate and account for how adverse weather conditions (i.e. snowfall, extreme cold, freezing rain, fog, etc.) will affect project schedule including temporary shut downs.

1.6 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

.2 Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

1.7 PROJECT MEETINGS

.1 Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.

.2 Weather related delays with their mitigation measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITION

.1 Shop Drawings: drawings, diagrams, illustrations, schedules, performance charts, brochures, photographs, reports and other data which are to be provided by the Contractor to illustrate details of a portion of Work.

1.2 ADMINISTRATIVE

.1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until review is complete.

.3 Present shop drawings, product data and samples in SI Metric units.

.4 Where items or information is not produced in SI Metric units converted values are acceptable.

.5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project tasks will be returned without being examined and considered rejected.

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.

.10 Submit to Departmental Representative all manifests or records of transfer for HCM impacted soils transported to the approved Land Treatment Unit (LTU), as indicated, within three (3) days of their placement and/or stockpiling on site. Contractor progress invoices, if applicable, for materials transported to the LTU will not be approved without supporting documentation.

.11 Submit to Departmental Representative all manifests for all granular material transportation to site within three (3) days of their placement and/or stockpiling on site. Contractor progress invoices for materials imported on-site will not be approved without supporting manifest and/or weigh bills.

.12 Keep one reviewed copy of each submission on site.

.13 In the event of discrepancies between the submittal schedule listed herein Section 01 33 00, Table 01 33 00-1 and elsewhere within the contract documents, precedent will be given to the submittals and submission schedule listed in Table 01 33 00-1.

2 PHOTOGRAPHS

.1 Provide digital photos in “Joint Photographic Experts Group” (.jpeg) format for Progress Photographs and Final Photographs.

.2 Digital photographs to have a minimum of 2,592 x 1,944 pixel (5 Megapixel) resolution.

.3 Progress and Final photographs to be submitted on one compact disc (CD). Provide two (2) copies of the Photograph CD.

.4 Printed (color) copies of digital photographs:

.1 Size: 100 mm x 125 mm

.2 Two digital photographs per 215 x 280 mm page.

.3 Pages to be white, of photographic quality paper and to be three-hole punched, ready for insertion into a three-ring binder. Binder to be vinyl, hard-covered, 3 inch D ring, sized for 215 x 280 mm paper, with spine pocket.

.5 Identification: Typewritten or generated by computer, the name and number of the Project on cover of CD case. Each photograph to be labelled with the digital photo file name positioned so as to not interfere with the view of the main activity or feature presented on the photograph. Also provide a description of each photograph in photographic log format in Microsoft Excel. Photographic log to be included with each computer disk, CD and binder. Description to include:

.1 Digital photograph file name.

.2 Name and description of feature.

.3 View direction.

.4 Date of exposure.

.5 GPS location.

.6 Before and after photographs of the location.

.6 Quantity: Provide sufficient number of photographs to adequately describe the Work activities carried out. A minimum of two photographs taken from two viewpoints are to be provided for each activity.

.7 Provide two sets in two binders of digital photographs.

.8 Submit final photographs prior to final progress payment request.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

Table 01 33 00-1
Contractor Submittal Schedule

Specification Section	Description	Date
01 31 19	Preconstruction Meeting	Within five (5) days after award of contract
01 31 19	Project Meeting Minutes	Three (3) days after meeting
01 31 19	Weekly Progress Report	Weekly for duration of project
01 31 19	Preliminary Project Schedule	Seven (7) contract days after award
01 31 19	Pre-mobilization site visit report	Seven (7) days after site visit
01 32 16.07	Master Plan	With Quotation and revisions within five (5) days of Notice to Proceed
01 32 16.07	Bar (GANTT) Chart	With Master Plan
01 32 16.07	Project Schedule	Within five (5) working days of Master Plan approval
01 33 00	Progress Photographs	With weekly progress report
01 33 00	Monthly Performance Measures Report	Monthly with Invoice
01 33 00	Daily Reports for Potential Additional Work	Daily, as required
01 33 00	Weekly Construction Meeting Reports	Weekly before Construction Meetings
01 33 00	Final Photographs	Prior to final progress payment request
01 35 13.43	Site Layout	Ten (10) days after award, prior to mobilization
01 35 29.14	Health and Safety Plan	Within 10 days of Notice to Proceed
01 35 29.14	Worker certifications	Within 10 days after contract award
01 35 29.14	Inventory of Site Specific Safety Equipment	Within 10 days of Mobilization
01 35 29.14	Incident /Accident Report	Verbal report due immediately after incident followed by written report in 24 hours
01 35 29.14	Near miss report	Within 24 hours of any near miss or incident
01 35 29.14	Work site Health and Safety Weekly inspection report	With Progress Report
01 35 29.14	Copies of Reports/Directions by Federal or Territorial Health and Safety Inspectors	Verbal report due immediately after incident followed by written report in 24 hours
01 35 29.14	On-site Contingency and Emergency Response Plan	With Health and Safety Plan
01 35 29.14	Correction Action report for non-compliance Health and Safety issue	as required
01 35 29.14	Report corrective action for observed environmental non-compliance	as required
01 35 43	Environmental Protection Plan	Within 10 days of Notice to Proceed

Specification Section	Description	Date
01 35 43	Copies of Environmental Approvals (Where applicable)	Prior to commencing Work or as required
01 35 43	Inventory of Environmental Protection Supplies	With environmental protection plan
01 35 43	Analytical Material Testing (Importation of fill and/or other materials)	As required and/or requested by the Departmental Representative
01 41 00	Copies of WHIMS MSDS sheets	On delivery of materials to site
01 52 00	Erosion Sediment and Drainage Control Plan	As required when revised
01 52 00	Construction Signage	Ten (10) days after Contract Award
01 77 00	Contractor's Inspection	Five (5) days prior to inspection
01 71 00	Receipt of existing conditions survey	Seven (7) days prior to any work commencing
01 71 00	Qualifications of Surveyor(s)	Ten (10) days prior to commencement of works
01 77 00	Request for Final Inspection	As required
01 77 00	Record Notations on Drawings	After project completion and before final inspection
01 77 00	Project Record Documents	At Project Completion and before Demobilization
01 78 00	Marked-up construction drawings (Site Layout)	Within five (5) days of Notice to Proceed
02 81 01	Proposed containers for transportation and storage of hazardous waste	Prior to shipping to site.
02 81 01	Material Safety Data Sheets	Prior to material delivery and commencement of work
02 81 01	Hazardous Materials Management Plan	Prior to mobilization to the site
02 81 01	Hazardous Materials Paperwork (shipping slips, waste manifests, and disposal)	Within 5 days after contractor reception
02 81 01	Exhaustive list and quantities of hazardous materials packaged, transported and disposed of.	Prior to project closure
02 82 00	Proof of suitable arrangements for disposal of asbestos containing waste.	Prior to commencement of works
02 82 00	Proof of Contractors asbestos liability insurance	Prior to commencement of works
02 82 00	Permits for transportation and storage of asbestos containing waste and proof that was has been received and properly disposed.	Upon project completion
31 05 16	Inform Departmental Representative of proposed source of aggregates	Within 14 days prior to commencing production
31 05 16	Any proposed changes to aggregate source material	Within 14 days in advance of proposed change
31 23 33.01	Submit condition survey of existing conditions	At least seven (7) days prior to excavation work.
31 23 33.01	Submit for review by Departmental Representative proposed dewatering methods	At least seven (7) days prior to excavation work.

Specification Section	Description	Date
31 23 33.01	Submit to Departmental Representative written notice prior to excavation work, to ensure cross sections are taken	At least seven (7) days prior to excavation work.
31 23 33.01	Submit construction equipment list for major equipment to be used in this section prior to start of Work	At least seven (7) days prior to excavation work.
31 32 19.01	Submit samples of geotextile for approval	Minimum four (4) weeks prior to beginning works
31 32 19.01	Submit samples of joining methodology for approval	Minimum four (4) weeks prior to beginning works
31 32 19.01	Mill Run QA/QC data showing that the material to be shipped to the site has test values for each property specified in the Contract Documents	Minimum four (4) weeks prior to beginning works
31 32 19.01	Written warranty from the geotextile manufacturer against defects or deficiencies in the quality of the geotextile material supplied	Prior to shipping to site
33 42 13	Submit manufacturer's instructions, printed product literature and data sheets for pipes and backfill and include product characteristics, performance criteria, physical size, finish and limitations.	Minimum four (4) weeks prior to beginning works
33 42 13	Submit proposed source of bedding materials	Minimum four (4) weeks prior to beginning works
33 42 13	Submit manufacturer's test data and certification	Minimum 4 weeks prior to beginning work.
	Draft Trilingual signage	Prior to submission for production
	Inuit Benefit Plan (IBP) Achievement documentation	With certificate of completion claim

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Transportation and Dangerous Goods Act (1999)

.2 Canadian Council of Ministers of the Environment (CCME) Documentation

.3 Species at Risk Act (SARA, 2002)

.4 Canadian Environmental Protection Act (CEPA, 1999)

.5 Alberta Environmental Protection and Enhancement Act (APEA, 2000)

.6 Alberta Occupational Health and Safety Act

1.2 DEFINITIONS

.1 Silt Fence: assembled, ready to install unit consisting of geotextile attached to drivable posts.

.2 Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 3-year service life from outdoor exposure.

.3 Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.

.4 Posts: sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Geotextile and net backing should be securely fastened to each post using suitable staples.

1.3 SUBMITTALS

.1 Submittals: in accordance with contract documents.

.2 Submittals for Progress Meetings: make submittals at least 24 hours prior to scheduled progress meetings as follows:

.1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, injury reports, equipment breakdown, and material removal.

.2 Copies of transport manifests, trip tickets, and disposal receipts for waste materials removed from work area.

.3 Weekly copies of site entry and work area logbooks with information on worker and visitor access.

.4 Other information required by Departmental Representative or relevant to agenda for upcoming progress meeting.

.3 Site Layout: within ten days after date of Contract award and prior to mobilization to site, submit updated site layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor including following:

.1 Means of ingress, egress and temporary traffic control facilities.

.2 Equipment and material staging areas.

.3 Aggregate stockpile areas. Debris stockpile areas.

.4 Hazardous waste storage container areas.

.5 Exclusion Zones, Contaminant Reduction Zones, and other zones specified in Contractor's site-specific Health and Safety Plan.

.6 Grading, including contours, required to construct temporary facilities.

1.4 REGULATORY REQUIREMENTS

.1 Provide erosion and sediment control in accordance with federal and territorial regulations.

.2 Provide any applicable dust control in accordance with federal and territorial regulations.

.3 Comply with federal, territorial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.

.4 Work to meet or exceed minimum requirements established by federal, territorial, and local laws and regulations which are applicable.

.1 Contractor: responsible for complying with amendments as they become effective.

.2 Minimum requirements compliance will be monitored using confirmatory samples. Contractor must allow for the collection of confirmatory samples.

.5 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify Departmental Representative immediately.

1.5 SOIL STOCKPILING FACILITIES

.1 Provide, maintain, and operate storage/stockpiling facilities as required and in accordance with contract documents.

1.6 DUST AND PARTICULATE CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures immediately during construction and in accordance with all applicable regulations.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use local water for dust and particulate control.

1.7 WATER CONTROL

.1 Maintain any excavation areas free of water.

.2 Protect site from standing or running water. Grade site to drain. Provide erosion control measures as required to protect native soils from erosion and permafrost from degrading.

.3 Prevent surface water runoff from leaving work areas.

.4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site.

.5 Prevent precipitation from infiltrating or from directly running off stockpiled contaminated soils and waste materials. Cover stockpiled contaminated soils and waste materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by Departmental Representative.

.6 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

.7 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.

1.8 EROSION AND SEDIMENT CONTROL

.1 Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas. Prevent erosion and sedimentation.

.2 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by Departmental Representative.

.3 Provide and maintain temporary measures which may include, silt fences, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, dikes, and other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction. Place silt fences in ditches to prevent sediments from escaping from ditch terminations.

.4 Plan construction procedures to avoid damage to work or equipment encroachment onto water bodies or drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank or water body to existing condition.

.5 Installation:

.1 Construct temporary erosion control items as indicated. Actual alignment and/or location of various items as directed by Departmental Representative.

.2 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

.3 Silt fence may be removed at beginning of work day, replace at end of work day.

.4 Whenever sedimentation is caused by re-grading or other development, remove it from adjoining surfaces, drainage systems and repair damage as quickly as possible.

.5 Prior to or during construction, Departmental Representative may require installation or construction of improvements to prevent or correct temporary conditions on site. Improvements may include berms, mulching,

sediment traps, detention and retention basins, grading, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by Departmental Representative.

.6 Remove temporary erosion and sediment control devices upon completion of Work. Materials once removed become property of Contractor.

.6 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

.7 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

.8 If soil and debris from site accumulate in low areas, roadways, ditches, or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.9 PROGRESS CLEANING

.1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.

.2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.10 FINAL DECONTAMINATION

.1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.

.2 Perform decontamination as specified to satisfaction of Departmental Representative. Departmental Representative will direct Contractor to perform additional decontamination if required.

1.11 REMOVAL AND DISPOSAL

.1 Remove surplus materials and temporary facilities from site.

.2 Dispose of non-contaminated waste materials, litter, debris, and rubbish off site.

.3 Do not burn or bury rubbish and waste materials generated by construction activities on site.

.4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner on-site.

.5 Do not discharge wastes into streams or waterways.

.6 Dispose of following materials at appropriate off-site facility identified by Contractor and approved by Departmental Representative:

.1 Non-contaminated litter and rubbish.

.2 Disposable PPE worn during final cleaning.

.3 Wastewater removed from wastewater storage tank.

.4 Wastewater generated from final decontamination operations including

wastewater storage tank cleaning.

.5 Materials from decontamination pads.

.7 Dispose of materials in accordance with contract documents and as directed by Departmental Representative.

.8 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

1.12 RECORD KEEPING

.1 Maintain adequate records to support information provided to Departmental Representative regarding reports as specified contract documents.

.2 Maintain waste manifests, bills of ladings for minimum of 375 days from date of issuance or longer period required by applicable law or regulation.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Territory of Nunavut

.1 Safety Act, 2008.

.2 Canada Labour Code, Canada Occupational Safety and Health Regulations 2002.

1.2 SUBMITTALS

.1 Make submittals in accordance with Contract Documents.

.2 Submit site-specific Health and Safety Plan within ten days after date of Contract Award and prior to mobilization to site. Address following items:

.1 Safety and health risk or hazard analysis for each site tasks and operation found in work plan, including:

.1 On-Site and Off-Site Traffic Management

.2 Extreme Temperature/Weather Works

.3 Works near and around Slopes/Inclines and unstable ground

.4 Works with and near Heavy Machinery

.5 Works with Hazardous Materials

.2 Develop checklist for items to be inspected on a daily basis. Document actions taken.

.3 Personnel training requirements including:

.1 Names of personnel and alternates responsible for site safety and health, hazards present on site, and use of personal protective equipment.

.2 Work practices by which personnel can minimize risks from hazards, safe use of engineering controls and equipment on site, medical surveillance requirements, including recognition of symptoms and signs which might indicate overexposure to hazards, and elements of site-specific Health and Safety Plan.

.4 Personal protective equipment (PPE) program addressing:

.1 Donning and doffing procedures.

.2 PPE selection based upon site hazards.

.3 PPE use and limitations of equipment.

.4 Work mission duration, PPE maintenance and storage.

.5 PPE decontamination and disposal.

.6 PPE inspection procedures prior to, during, and after use.

.7 Evaluation of effectiveness of PPE program, and limitations during temperature extremes, and other appropriate medical considerations.

.8 Medical surveillance requirements for personnel assigned to work at site.

.9 Frequency and types of air monitoring, personnel monitoring, and environmental sampling techniques and instrumentation to be used, including methods of maintenance and calibration of monitoring and sampling equipment.

.10 Site control measures employed at site including site map, site work zones, use of 'buddy system', site communications including site security, alerting means for emergencies, standard operating procedures or safe work practices, and identification of nearest medical assistance.

.11 Decontamination procedures for both personnel and equipment.

.12 Emergency response requirements addressing: pre-emergency planning, personnel roles, lines of authority and communication, emergency recognition and prevention, safe distances and places of refuge, site security and control, evacuation routes and procedures, decontamination procedures not covered under decontamination section, emergency medical treatment and first aid, emergency alerting and response procedures, critique of response and follow-up, PPE and emergency equipment, site topography, layout, prevailing weather conditions, and procedures for reporting incidents to local, provincial, or federal agencies.

.13 Procedures dealing with heat and/or cold stress.

.14 Spill containment program if waste material is generated, excavated, stored, or managed on site.

.3 Ensure Contractor’s site-specific Health and Safety plan outlines the plan and procedures that will be undertaken to ensure work inside of or adjacent to an excavation is completed safely and in compliance with applicable regulations.

.4 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within three days after receipt of comments from Departmental Representative.

.5 Medical Surveillance: submit certification of medical surveillance for site personnel, within 10 days after date of Contract Award and prior to mobilization to site. Submit additional certifications as personnel are sent to site.

.6 On-site Contingency and Emergency Response Plan: submit with health and safety plan and address standard operating procedures to be implemented during emergency situations associated with:

.1 On site works

.2 Institutional controls

.7 Off-site Contingency and Emergency Response Plan: submit with health and safety plan and include:

.1 Prior to commencing Work involving handling of hazardous materials, develop off-site Contingency and Emergency Response Plan.

.2 Plan must provide immediate response to serious site occurrence such as explosion, fire, or migration of significant quantities of toxic or hazardous material from site.

.8 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within five days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within three days after receipt of comments from Departmental Representative prior to commencing Work involving handling of hazardous materials, develop off-site Contingency and Emergency Response Plan.

1.3 FILING OF NOTICE

.1 File Notice of Work with Federal and Territorial Authorities having jurisdiction.

1.4 REGULATORY REQUIREMENTS

.1 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials and other hazards (such as wildlife encounters, falls, etc.).

1.5 SITE CONDITIONS

.1 Work at site will involve contact with:

.1 Landfill Waste including metals and demolition debris.

.2 Petroleum Hydrocarbons (PHCs), Polycyclic Aromatic Hydrocarbons, and metals.

.3 Benzene, Toluene, Ethylbenzene, Xylenes (BTEX) generated from operations of equipment.

.4 Hazardous Wastes including Batteries, Antifreeze/Glycols, Paints (lead and PCB bearing), Asbestos Containing Material, Ozone-Depleting Substances and/or Pesticides.

.5 Unstable material conditions on slopes.

1.6 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan prior to commencing site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Ensure Health and Safety guidelines provide for safe and minimal risk working environment for site personnel and minimize impact of activities involving contact with hazardous materials or hazardous wastes on general public and surrounding environment.

.3 Relief from or substitution for portion or provision of minimum Health and Safety Guidelines specified or reviewed site-specific Health and Safety Plan must be submitted to Departmental Representative in writing. Departmental Representative will respond in writing, either accepting or requesting improvements.

1.7 RESPONSIBILITY

.1 Be responsible for safety of persons and property on site and for protection of persons off site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

1.8 HAZARD COMMUNICATION REQUIREMENTS

.1 Comply with Work Site Hazardous Materials Information System Regulations, RRNWT (Nu) 1990 c S-2, (Safety Act) — Nunavut

.2 Comply with Asbestos Safety Regulations, NWT Reg. (NU) 016-92, (Safety Act) — Nunavut

.3 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations, Part X - Hazardous Substances.

.4 Provide Departmental Representative with Material Safety Data Sheets (MSDS) and documentation on any "hazardous" chemical that Contractor or Contractor Representatives plan to bring onto site.

1.9 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

.2 Assign responsibility and obligation to Health and Safety Officer where required to stop or start Work when, at Health and Safety Officer's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

1.10 UNFORESEEN HAZARDS

.1 Should unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, stop work and immediately advise Departmental Representative verbally and in writing.

1.11 HEALTH AND SAFETY OFFICER

.1 Employ and assign to Work competent and authorized representative as Health and Safety Officer. Health and Safety Officer must:

.1 Have minimum 2 years' site-related working experience specific to activities associated with the similar site work.

.2 Have basic working knowledge of specified occupational safety and health regulations.

.3 Be responsible for completing Health and Safety Training Session and ensuring that personnel not successfully completing the required training are not permitted to enter site to perform Work in Exclusion Zone or Contaminant Reduction Zone.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Health and Safety Plan.

.5 Be on site during execution of Work.

1.12 PERSONNEL HEALTH, SAFETY, AND HYGIENE

.1 Medical Surveillance: Where applicable, conduct medical surveillance of personnel as required by specified regulations.

.2 Training: ensure personnel entering site are trained in accordance with specified personnel training requirements. Training session must be completed by Health and Safety Officer.

.3 Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity. For work with asbestos containing material, comply with the protective equipment requirements listed in Contract Documents. Minimum PPE required for each level of protection as follows:

Modified Level C:

.1 Head, Eye, Ear Protection: hard hat, safety glasses, ear muffs or plugs.

.2 Hand Protection: gloves.

.3 Foot Protection: safety boots.

.4 Clothing: chemical resistant, thermal and weather specific, as required.

.4 Personal Protective Equipment: Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.

.5 Develop protective equipment usage procedures and ensure that procedures are strictly followed by site personnel; include following procedures as minimum:

.1 Ensure prescription eyeglasses worn are safety glasses.

.2 Ensure footwear is steel-toed safety boots and is covered by rubber overshoes when entering or working in potentially contaminated work areas.

.3 Dispose of or decontaminate PPE worn on site at end of each workday.

.4 Decontaminate reusable PPE before reissuing.

.6 Temperature Stress: implement heat/cold stress monitoring program as applicable and include in site-specific Health and Safety Plan.

.7 Personnel Hygiene and Personnel Decontamination Procedures. Provide minimum as follows:

.1 Suitable containers for storage and disposal of used disposable PPE.

.2 Potable water and suitable sanitation facility.

.8 Emergency and First-Aid Equipment:

.1 Provide and maintain emergency and first-aid equipment in appropriate location on site as required by the regulations of the authorities having jurisdiction.

.2 As minimum, provide 1 certified first-aid technician on site at all times when work activities are in progress.

.9 Site Communications:

.1 Post emergency numbers at conspicuous locations with site satellite telephone.

.2 Ensure personnel use of "buddy" system and develop hand signal system appropriate for site activities.

.3 Safety Meetings: conduct mandatory daily safety meetings for personnel, and additionally as required by special or work-related conditions; include refresher training for existing equipment and protocols, review ongoing

safety issues and protocols, and examine new site conditions as encountered. Hold additional safety meetings on as-needed basis.

.10 Hazardous Substances:

.1 If the Work entails the use of any toxic or hazardous materials or chemicals, or otherwise creates a hazard to life, safety, or health, Work will be in accordance with the National Fire Code of Canada, Occupational Health and Safety Legislation, and WHMIS.

.2 Departmental Representative is to be advised, and a "Hot Work" permit issued by Contractor's designated representative in all cases involving welding, cutting, burning or the use of blow torches and salamanders. Special precautions are necessary to safeguard life and property from damage by fire or explosives.

.3 Wherever Work is being carried out in dangerous or hazardous areas involving the use of heat, fire watchers, equipped with sufficient fire extinguishers, will be provided. The determination of dangerous or hazardous areas along with the level of precaution necessary for Fire Watch will be at the discretion of Contractor. Notify Departmental Representative prior to that determination.

.4 Provide proper ventilation and eliminate all sources of ignition where flammable liquids, such as lacquers or urethanes are used.

.11 Wildlife Management:

.1 Develop a Wildlife Management Plan, as part of the Site Specific Health and Safety Plan, that includes bear and large mammal safety and as a minimum meets the following requirements:

.1 Firearms must be stored and used in accordance with all Authorities having jurisdiction. Terms of Use for firearms must be submitted to Departmental Representative for review.

.2 All wildlife signs, encounters and sightings must be reported to Departmental Representative immediately and as part of the weekly report.

.3 A minimum of one person for each work team must be designated as a wildlife monitor and trained in firearms and wildlife deterrent use in accordance with Authorities having jurisdiction. Qualifications and training plans for wildlife monitors must be submitted to Departmental Representative as part of the Site Specific Health and Safety Plan.

1.13 FUEL MANAGEMENT

.1 Vehicle and equipment re-fuelling:

.1 All vehicle and equipment re-fuelling must be conducted by appropriately trained personnel using the effective personal protective equipment in a manner which meets or exceeds regulatory requirements, including using drip pans.

.2 Records of fuel usage by activity must be maintained.

.2 Fuel transport:

.1 All fuel transports including mobile re-fuelling trucks and fuel transport to stationary equipment such as generators or pumps or distributed storage

areas, must occur in approved (CSA) containers with the notification and consent of site safety personnel.

.3 Provide plans for on site storage of fuel if required. All fuels required for the Work will be stored on site with appropriate secondary containment as per authorities having jurisdiction.

1.14 VEHICLE AND EQUIPMENT USAGE

.1 Use of vehicles or equipment only when trained and authorized to do so.

.2 Seatbelts must be worn at all times vehicle or equipment is in operation. Provide high visibility items such as beacons, etc.

.3 Speed limits must be set and obeyed.

.4 If access conditions are unsafe or marginally unsafe, maintain access to acceptable standards. Do not risk property damage or injury.

.5 Vehicles are to not be idled for longer than 10 minutes (warm up) unless explicitly used as a place of refuge during animal encounters or for personnel working outdoors during cold weather operations. Exceptions are to be made in consultation with Departmental Representative.

.6 Perform vehicle maintenance and lubrication of equipment in a manner that avoids spillage of fuels, oils, grease, and coolants. When re-fuelling equipment, use leak free containers and reinforced rip and puncture proof hoses and nozzles. Remain in attendance for duration of refuelling operation, and ensure that all storage container outlets are properly sealed after use.

.7 Place drip pans under stationary equipment with potential leaks.

.8 Vehicle/Equipment checks must be completed and the logbook updated at the beginning of every shift or when starting any vehicle of piece of equipment.

1.15 FLAMMABLE LIQUIDS

.1 The handling, storage and use of flammable liquids will be governed by the current National Fire Code of Canada.

.2 Flammable liquids such as gasoline, kerosene and naphtha may be kept for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing the Underwriter's Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable liquids exceeding 45 litres for Work purposes, requires the permission of the permitting authority.

.3 Do not transfer flammable liquids in the vicinity of open flames or any type of heat-producing devices.

.4 Do not use flammable liquids having a flash point below 38°C such as naphtha or gasoline as solvents or cleaning agents.

.5 Store flammable waste liquids, for disposal, in approved containers located in a safe ventilated area. Quantities are to be kept to a minimum and Departmental Representative is to be notified when disposal is required.

.6 Dispose of all flammable liquids in accordance with all applicable environmental regulations and with the contract documents.

1.16 STORAGE AND HANDLING OF FUEL

.1 Locate fuel storage areas as approved by Departmental Representative and in accordance with the Water Board Permit.

.2 Inspect fuel storage and dispensing facilities daily. Make available fire fighting and spill response equipment for immediate access at each fuel storage location.

.3 Store all barrels containing fuel and/or hazardous materials in an elevated position, either on their side with bungs facing 9 and 3 o'clock position, or on pallets, upright, and banded.

.4 All barrels to be individually identified. Label will be to industry standards and will provide all information necessary for health and safety and environmental purposes. Make available, to all personnel, Material Safety Data Sheets for all materials maintained at site or along right-of-ways.

.5 All barrels/fuel containers to be labelled with owner's name, and Contractor's name as required by the Land Use Permit.

.6 Treat all waste petroleum products, including used oil filters as hazardous materials.

.7 Conduct regular inspections of all machinery hydraulic, fuel, and cooling systems. Repair leaks immediately.

.8 Pre-assemble and maintain emergency spill equipment, including at least two (2) fuel pumps, empty 200 L barrels and absorbent material sufficient to clean up a 1000 litre spill at all fuel storage sites. Maintain spill mats or pan under mobile fuelling containers and a spill kit at the re-fuelling area.

.9 Remove all full and empty barrels, fuel storage facilities and associated materials and equipment from site at conclusion of Work.

1.17 SPILL CONTINGENCY AND EMERGENCY RESPONSE

.1 Meet specified requirements and applicable regulations.

.2 Submit to Departmental Representative, detailed Spill Contingency Plan. Identify response capabilities by detailing response times, and types and volumes of spills to which Contractor can respond. Following information is required as a minimum:

- .1 A description of pre-emergency planning.
- .2 Personnel roles, lines of authority and communication, emergency phone numbers.
- .3 Emergency alerting and response procedures.
- .4 Evacuation routes and procedures, safe distances and places of refuge.
- .5 Directions/methods of getting to nearest medical facility.
- .6 Emergency decontamination procedures.
- .7 Emergency medical treatment and First-Aid.
- .8 Emergency equipment and materials.
- .9 Emergency protective equipment.
- .10 Procedures for reporting incidents.
- .11 Spill response and containment plans for all materials that could potentially be spilled.

1.18 MEDICAL

.1 Provide and maintain first aid and medical care and facilities for all workers as required by the Statutes of the Nunavut Safety Act.

.2 Provide the appropriate numbers of first aid kit, based on the number of workers, in accordance with the Nunavut Safety Act.

.3 Establish an Emergency Response Plan acceptable to the Departmental Representative, for the removal of any injured person to medical facilities or a doctor's care in accordance with applicable legislative and regulatory requirements.

.4 Emergency and First Aid Equipment:

.1 Locate and maintain emergency and first aid equipment in appropriate location on site including first aid kit to accommodate number of site personnel; portable emergency eye wash; fire protection equipment as required by legislation.

.2 Locate two (2) self-contained blankets and towels; stretcher; and one (1) hand held emergency siren in all work areas.

1.19 ACCIDENTS AND ACCIDENT REPORTS

.1 Immediately report, verbally, followed by a written report within 24 hours, to Departmental Representative, all accidents of any sort arising out of or in connection with the performance of the Work, giving full details and statements of witnesses. If death or serious injuries or damages are caused, report the accident promptly to Departmental Representative by telephone or other means in addition to any report required under Federal and Territorial laws and regulations.

.2 If a claim is made by anyone against Contractor or Subcontractor on account of any accident, promptly report the facts in writing to Departmental Representative, giving full details of the claim.

1.20 SITE SECURITY

.1 Limit site access only to persons employed on the Project. Unauthorized persons will be permitted on site only with the APPROVAL of the Departmental Representative and Contractor.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 REFERENCE STANDARDS

.1 Comply with federal, territorial and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish including, but is not limited to:

.1 Transportation and Dangerous Goods Act. (TDG)

.2 Canadian Environmental Protection Act. (CEPA)

.3 Environmental Protection Act, RSNWT (NU) 1988, c E-7 (Supp)

.4 Water Resources Agreement Act, RSNWT (NU) 1988, c 17 (Supp)

.5 Nunavut Safety Act,

.6 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.

.1 Contractor is responsible for complying with amendments as they become effective.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with the contract documents.

.2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review and approval by Departmental Representative within 10 days of notice to proceed.

.3 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.

.4 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.5 Include in Environmental Protection Plan:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Drawings showing locations of proposed material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.6 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to minimize amount of mud transported onto public roads by vehicles or runoff.

.7 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.8 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.

.9 Hazardous waste (solid and liquid) packaging and transport plan identifying methods and locations for hazardous waste storage including clearing debris.

.10 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.11 Submit weekly progress report as the work proceeds.

.6 Prior to commencing construction activities or delivery of materials to site, provide an updated Environmental Protection Plan for review and approval by Departmental Representative.

1.4 FIRES

.1 Fires and burning of rubbish on site is not permitted.

1.5 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials generated by construction activities on site.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, drainage ditches, storm or sanitary sewers. These materials must be properly containerized and shipped off site.

.3 Provide sufficient suitable covered refuse containers throughout site to receive and control construction wastes prior to final disposal. Keep containers closed to prevent contents from blowing around site or onto surfaces in airside areas.

.4 All waste and debris is to be removed, packaged, stored and/or segregated, as indicated and as directed by the Departmental Representative. Compliance with applicable regulations is mandatory.

.5 Refuse containers shall be emptied at least once per week to control odours and to prevent attracting birds and other wildlife.

1.6 DRUMS

.1 Storage of Liquid Waste: Adequately sized drums made of appropriate materials, with closable and sealable lids, complete with labels for marking contents and date filled.

.2 Storage of Solid Hazardous Waste: Adequately sized drums made of appropriate materials, closable and sealable lids, complete with labels for marking contents and date filled.

1.7 POLLUTION CONTROL

.1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of contaminants, noxious substances and pollutants generated by construction work

.2 Fuel Management as per sections 01 35 29 1.13, 01 35 29 1.15, 01 35 29 1.16, 01 35 29 1.17 of the specifications.

.3 Be prepared to intercept, cleanup, and dispose of spills or release that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.

.4 Promptly report spills and releases potentially causing damage to the environment to:

.1 Authority having jurisdiction or interest in spill or release including Nunavut Department of Environment, local conservation authority, water supply authorities, drainage authority, road authority, and fire department.

.2 Owner of pollutant, if known.

.3 Person having control over pollutant, if known.

.4 Departmental Representative

.5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant to local authorities' emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 DUST AND PARTICULATES CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures as determined necessary by Departmental Representative during construction and in accordance with Authorities having jurisdiction.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere.

.4 Departmental Representative may stop Work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at the site.

1.9 CONTAMINATED SOIL AND WASTE MANAGEMENT

.1 All contaminated soil, landfill waste and liquid waste, if encountered, shall be separated and managed on-site to prevent contamination of uncontaminated material or migration to non-contaminated areas. Notify Departmental Representative immediately of any discoveries of contaminated soils, hazardous (liquid or solid) waste and groundwater during work not identified by the contract documents.

1.10 IMPORTATION OF FILL AND/OR OTHER MATERIALS

.1 It is the contractor's responsibility to provide documentation pertaining to:

.1 Environmental quality of the material, including analytical testing results (where required).

.2 Disclose location of origin for the material and provide historical/current details (e.g. nearby or former activities that may have an impact on material environmental quality).

.3 Submit a bulk sample of each material to the departmental representative for approval.

.4 Provide at least 5 working days lead time for approval.

.5 Conduct additional testing, at the cost of the contractor, if requested by the Departmental Representative.

.6 Remove any excess imported materials from the Site.

1.11 TEMPOPRARY 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 according to requirements of authorities having jurisdiction, sediment and erosion control plan, specific to site, that complies requirements of authorities having jurisdiction, whichever is more stringent.

.2 Remove erosion and sedimentation controls upon completion of the works as agrees by the Departmental Representative. Restore and stabilize areas disturbed during removal in accordance with the instructions provided by the Departmental Representative.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCE AND CODES

.1 Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of territorial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2 Meet or exceed requirements of:

.1 Contract documents.

.2 Specified standards, codes and referenced documents.

.3 Perform Work in accordance with the Contract Documents and meet or exceed all codes, standards and regulations applicable to the Work and issued under the authority of the Government of Canada and the Government of Nunavut. Advise the Departmental Representative of any discrepancies in the codes, standards, and regulations applicable to the Work.

1.2 REFERENCE AND CODES – FEDERAL

.1 Meet or exceed the governing codes, standards and guidelines, and regulations applicable to Work (as amended) and issued under the authority of the Government of Canada as follows:

.1 Canada Labour Code Part II-Occupational Health and Safety (R.S. 1985, c.L-2).

.2 Canada Occupational Health and Safety Regulations (SOR/86-304)

.3 Canadian Environmental Protection Act, S.C. 1999 (S.C. 1999, c.33) a.SOR/2002-318

.4 Controlled Products Regulations (SOR/88-66) a.SOR/2001-254

.5 Inter-provincial Movement of Hazardous Waste Regulations (SOR/2002-301)

.6 National Fire Code of Canada, 1995 a. 2002

.7 Ozone Depleting Substances Regulations, 1998 (SOR/99-7)

.8 Transportation of Dangerous Goods Act, 1992 (S.C. 1992, c.34) a.1999, c.31

.9 Transportation of Dangerous Goods Regulations (SOR/2001-286) a.SOR/2003-400

.10 Territorial Land Use Regulations (C.R.C., c.1524) a.98-430

.11 Arctic Waters Pollution and Prevention Act (A.A. 1985 CA-12)

.12 Nunavut Waters and Nunavut Surface Rights Tribunal Act (SOR/2002-253)

1.3 REFERENCE AND CODES – NUNAVUT

.1 Meet or exceed the governing codes, standards and guidelines, and regulations applicable to work and issued under the authority of the Government of Nunavut as follows:

.1 Environmental Protection Act (Nunavut) (R.S.N.W.T. 1988, c. E-7) a. 1998, c. 21, c. 24.

.2 Labour Standards Act (Nunavut) (R.S.N.W.T. 1988, c. L-1) amended S.Nu. 2012, c. 12, in force June 8, 2012.

.3 Public Health Act, S.N.W.T. 2007, c.17.

.4 Workplace Hazardous Materials Information System Regulations (R.R.N.W.T. 1990, c. S-2).

.5 Spill Contingency Planning and Reporting Regulations R-068-93.

.6 Fire Prevention Act, R.S.N.W.T. 1988, c. F-6.

.7 Used Oil and Waste Fuel Management Regulations, R-064-2003.

.8 Transportation of Dangerous Goods Act (S.N.W.T. 1990, c. 36).

1.4 STANDARDS AND GUIDELINES

.1 Environmental Guideline for Management of Waste Batteries, January 2011, Government of Nunavut.

.2 Environmental Guideline for Management of Waste Solvents, January 2011, Government of Nunavut.

.3 Environmental Guidelines for Site Remediation, March 2009, Government of Nunavut.

.4 Environmental Guideline for Ambient Air Quality Standards, January 2011, Government of Nunavut.

.5 Environmental Guidelines for Dust Suppression, January 2002, Government of Nunavut.

.6 Environmental Guideline for Management of Waste Asbestos, April 2011, Government of Nunavut.

.7 Environmental Guideline for General Management of Hazardous Waste, October 2010, Government of Nunavut.

.8 Environmental Guidelines for Ozone Depleting Substances, January 2002, Government of Nunavut.

.9 Environmental Guideline for Industrial Waste Discharge into Municipal Solid Waste and Sewage Treatment Facilities, April 2011, Government of Nunavut.

.10 Environmental Guidelines for Industrial Waste Discharge, January, 2002, Government on Nunavut

1.5 PERMITS AND LICENCES

.1 The following permits and licenses will be provided to the Contractor:

.1 Water Use Licence granted by the Nunavut Water Board.

.2 Obtaining any other necessary permits and licenses is the responsibility of the Contractor.

.3 Respond to all regulatory inquires in order to get permits and licences mentioned above and provide Departmental Representative with a copy of each response.

1.6 WHMIS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets acceptable to Labour Canada and Health and Welfare Canada.

.2 Deliver copies of WHMIS data sheets to Departmental Representative on delivery of materials.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 SUBMITTALS

.1 Provide submittals in accordance with contract documents.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously including, but not limited to:

- .1 Construction lighting.
- .2 Electrical power.
- .3 Communications.
- .4 Water.
- .5 Heating.

.2 Remove from site all such work after use.

1.3 DEWATERING

.1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water as directed in contract documents.

1.4 WATER SUPPLY

.1 Provide supply of potable water for construction use and dust control at no extra cost to the Client or Departmental Representative.

1.5 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and install a telephone for emergency communications while at work site. Locate phone in an area in close proximity to on-site workers.

.2 Provide and pay for temporary telephone necessary for own use and use by Departmental Representative at selected accommodations.

1.6 SANITARY FACILITIES

.1 Provide and pay for temporary portable toilets and maintain facilities in proper condition as required by the applicable regulations and requirements.

.2 Provide a source of heat in the sanitary facilities.

1.7 REMOVALS UPON COMPLETION

.1 Unless otherwise directed, arrange for disconnect of temporary services and utilities, remove power, lighting and communications equipment and cabling and make good at completion of Contract to satisfaction of the Departmental Representative. Pay all costs associated with disconnection of temporary services and utilities.

1.8 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CAN/CSA-Z321-96, Signs and Symbols for the Occupational Environment.

1.2 SUBMITTALS

.1 Provide submittals in accordance with contract documents.

.1 Provide draft of construction signage for approval 10 days after contract award.

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be staged and used by Contractor, type and quantity of equipment to be used, avenues of ingress/egress to work areas and details of fence/barrier installation, as necessary.

.2 Identify areas requiring grading or aggregate to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Restore areas occupied by temporary construction facilities to at least original condition that existed at start of construction.

1.4 HOISTING

.1 Provide, operate and maintain hoists/cranes required for moving materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists and/or cranes to be operated by qualified operator.

1.5 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.6 ACCESS

.1 Provide and maintain adequate access to project site for material, equipment and personnel. Where indicated on Contract Drawings, access site via designated haul roads and gates. Build up and maintain access roads to facilitate construction activities and return access road to equal or better condition prior to completion of the contract.

.2 Build and maintain temporary ramping for access routes, as required, and provide snow and ice removal, if required during period of work. Restore areas to original condition, unless directed otherwise by the Departmental Representative.

.3 Use existing roads for access to project site, as indicated. Maintain such roads for duration of contract and repair any damage resulting from Contractor's use of roads.

.4 Provide construction warning signs along existing roads that are used by construction traffic in compliance with local authorities having jurisdiction and subject to the Departmental Representative approval.

.5 Where required, provide detour roads, ramps, culvert crossings to ensure traffic is maintained without hindrance. Provide and maintain signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

1.7 EMERGENCY ACCESS ROUTES

.1 Maintain direct and quick access to Site by emergency vehicles at all times throughout the duration of the work (e.g. regularly maintain access road and overhead clearances).

1.8 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from project work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified by the local authorities having jurisdiction.

.3 Place and maintain signs and other devices in locations recommended by the local authorities having jurisdiction.

1.9 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

1.10 TEMPORARY UTILITIES

.1 Provide temporary utilities to the Site including power for the duration of Site works. Power maybe in the form of a portable generator.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials, as required by the Contractor.

.2 Locate materials not required to be stored in weatherproof sheds, provided by Contractor as necessary, on site in manner to cause least interference with work activities.

1.12 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

.3 Regularly clean and maintain washroom facilities. Empty out refuse and effluent at least once a week or greater if required.

1.13 CONSTRUCTION SIGNAGE

.1 Provide site signage in English, French, and Inuktitut on all marine shipping containers and at any temporary or long-term storage area. Signage must indicate type of material being stored and provide general cautions in layman's terms.

.2 No signs or advertisements, other than warning signs, are permitted on site. Company signs will be permitted with the approval of the Departmental Representative.

.3 Signs and notices for safety and instruction shall be in both official languages and Inuktitut. Graphic symbol shall conform to CAN/CSA-Z321.

.4 Maintain approved signs and notices in good condition for duration of project, and dispose of off-site on completion of project or earlier if directed by the Departmental Representative.

1.14 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Contractor's traffic on public roads selected for hauling material to and from site should interfere as little as possible with public traffic.

.3 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.4 Construct access and haul roads as necessary. Reinstate areas to original or better level and condition.

.5 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.6 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.7 Dust control: adequate to ensure safe operation at all times.

.8 Location, grade, width, and alignment of construction and hauling roads: subject to approval by Departmental Representative.

.9 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.10 Provide snow removal during period of Work.

.11 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.15 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously.

.2 Relocate marine shipping containers as required for use in the Hazardous Materials Storage Area.

1.2 HOARDING

.1 Provide fencing as necessary to maintain a safe site for personnel and wildlife.

.2 All excavations or unsafe slope left open at the end of the day will be adequately secured and locked using appropriate barriers and/or fencing/barricades.

1.3 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations, working slopes and along access ramps/roads.

.2 Provide as required by governing authorities.

1.4 ACCESS TO SITE

.1 Provide and maintain access roads, ramps and construction routes as may be required for access to Work.

.2 Build up and maintain access road to facilitate construction activities. Restore access to original or better condition prior to completion of the contract.

1.5 FIRE ROUTES

.1 Maintain access to property including overhead clearances for use by emergency response vehicles.

1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with contract documents.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 QUALIFICATIONS OF SURVEYOR

.1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Departmental Representative.

1.2 SURVEY REFERENCE POINTS

.1 Establish base horizontal and vertical control points as designated by the Departmental Representative.

.2 Protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice and approval from the Departmental Representative.

.4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.3 SURVEY REQUIREMENTS

.1 Establish stable survey control points for use in laying out work. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish four temporary survey control points at AEC 3, two at the top of the landfill and two at the bottom; two temporary survey control points at AEC 2, and two temporary survey control points at AEC 1.

.3 Prepare a topographic map of Work Sites (AEC 1, AEC 2, AEC 3), prior to mobilization or excavation Work as directed by Departmental Representative to provide a baseline survey for quantity measurements.

.4 Maintain surveys for quantity calculations.

.5 Survey elevations <u>prior to any earthworks</u> including, but not limited to:

- .1 Soil stripping in AEC-3 and along the road to the base of AEC-3.
- .2 Regrading of areas.
- .3 Excavation and removal of buried debris.
- .4 Excavation of contaminated soils in AEC 1 and AEC 2.
- .5 Importing, placing and compaction of imported backfill.

.6 Survey elevations <u>after any earthworks</u> including, but not limited to:

- .1 Soil stripping in AEC 3 and along the road to the base of AEC 3
- .2 Regrading of areas.
- .3 Excavation and removal of buried debris.
- .4 Excavation of contaminated soils in AEC 1 and AEC 2.
- .5 Importing, placing and compaction of wastes and aggregates to build the Landfill Embankment and aggregates to build the Main Access Road and Ramp

.6 Final grading.

.7 Prepare a topographic map of Work Sites (AEC 1, AEC 2, and AEC 3) at the end of the contract as directed by Departmental Representative to provide a baseline survey for quantity measurements.

1.4 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.5 SUBMITALS

.1 Submit name and address of Surveyor to Departmental Representative.

.2 Submit the topographic map to the Departmental Representative a minimum of seven (7) days prior to any work commencing on the Site.

.3 Submit raw and processed survey data collected after each surveying event conducted at the site within 5 days of the survey being carried out.

.4 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

.5 Submit certificate signed by surveyor certifying those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.6 SUBSURFACE CONDITIONS

.1 Carry out a test pit/probe survey along proposed alignment of ditches and record depth to bedrock and elevation of bedrock surface

.2 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.3 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 All close-out requirements are considered included under the contract and at no additional cost to the Departmental Representative.

.2 Acceptance of Work Procedures:

.1 Contractor's Inspection: the Contractor shall carry out an inspection of the Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request Departmental Representative Inspection

.2 Departmental Representative Inspection:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.

.2 Final Inspection will include topographic survey of final grade as well as inspection of all constructed erosion control features, as well as all areas where temporary controls were installed and all areas where work was conducted.

.3 Where Work is deemed deficient by the Departmental Representative, complete outstanding Work and request re-inspection.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with contract documents.

.2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two final copies of marked-up (in red) construction drawings indicating work completed.

.3 Furnish evidence, if requested, for type, source and quality of products provided. Such evidence as a minimum shall include weigh tickets, waste manifests, time logs, permits, etc.

1.2 AS-BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

.5 Reviewed shop drawings, product data, and samples.

.6 Field test records.

.7 Inspection certificates.

.2 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.

.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.2 Maintain record documents in clean, dry and legible condition.

.3 Do not use record documents for construction purposes.

.3 Keep record documents and samples available for inspection by Departmental Representative.

1.3 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on two sets of drawings and specifications.

.2 Provide and use felt tip marking pens, maintaining separate colours for each major system, for recording information.

.3 Record information concurrently with construction progress.

.1 Do not conceal Work until required information is recorded.

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Measured horizontal and vertical extent of work completed. Provide measurements of areas where work is completed.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Measured horizontal and vertical locations of excavated, cut, Landfill Waste.

.5 Measured horizontal and vertical locations of backfilled areas. Provide measurements of backfilled areas for each type of fill.

.6 Measured horizontal and vertical locations of any soil contamination identified.

.7 As-builts and field changes of dimension and detail. All as built dimensions shall be completed by the use of a total station survey and provided in electronic AutoCAD format.

.8 Changes made by change orders.

.9 Details not on original Contract Drawings.

.10 References to related shop drawings and modifications.

.11 All existing services and structures encountered during the course of the work but not removed.

.5 Specifications: mark each item to record actual construction, including:

.1 All work completed, particularly optional items and substitute items.

.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

.7 Provide digital photos, as requested, for site records.

.8 Maintain tickets/logs, waste manifests, and weigh bills for off-site removal/disposal of hazardous materials. Provide copies to Departmental Representative upon request and within 2 weeks of completion of Works.

1.4 FINAL SURVEY

.1 Submit final site survey in accordance with Contract Documents, certifying that the packaging, storage, segregation and locations of completed Work are in conformance, or non-conformance, with Contract Documents at the end of the contract.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 41 13 - Selective Site Demolition- Non Hazardous Materials

.2 Section 02 81 01 - Hazardous Materials

.3 Section 31 05 16 - Aggregate Materials

.4 Section 31 22 15 – Grading

1.2 REFERENCES

.1 Canadian Environmental Protection Act, 1999 (CEPA), c. 33.

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.3 Material Safety Data Sheets (MSDS).

.4 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34.

1.3 DEFINITIONS

.1 Surface Debris: visible debris on the existing ground surface only in areas as designated by the Departmental Representative, consisting of hazardous and non-hazardous material.

.2 Buried Debris: landfill materials that are covered, partially covered or below the surface of the surrounding area and require mechanical equipment to access, uncover, extricate or excavate to be packaged or hauled.

1.4 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, TDGA, the Land Use Permit, and applicable Federal, Territorial regulations.

.2 During Start-up meeting and in accordance with the contract documents, verify Project requirements, review site conditions and provide co-ordination with other Subcontractors.

.3 Arrange for site visit with the Departmental Representative to examine existing site conditions adjacent to demolition Work, prior to start of Work.

.4 Execute construction occupational health and safety in accordance with the contract documents.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Perform work in accordance with contract documents.

.2 Collect, transport and segregate into stockpiles/caches all surface and partially buried debris (non-hazardous) from AEC-1, as indicated and as directed.

.3 Collect, transport and segregate into stockpiles/caches all surface debris (non-hazardous) from AEC-2, as indicated and as directed.

.4 Store and manage non-hazardous materials in accordance with contract documents.

.5 Transport non-hazardous debris for disposal to AEC-3 in accordance with contract documents.

1.6 SITE CONDITIONS

.1 Ensure proper handling and disposal procedures are maintained throughout the Project.

.2 Review the site conditions upon arrival to the site and amend the Work Plan and schedule in consultation with Departmental Representative.

.3 All hazardous materials are to be removed before non-hazardous materials when possible.

.4 Additional Site information can be obtained from the appended reports that have been included for INFORMATION ONLY purposes.

1.7 SCOPE OF WORK

.1 Scope of activities is as follows but not limited to:

.1 Clearing access trails and constructing temporary ramps where necessary.

.2 Collecting and remove surface debris from site areas (AEC-1, AEC-2 and AEC-3) as indicated.

.3 Removing buried debris to a maximum depth of one (1) metre from site areas (AEC-1 and AEC-2) as indicated and as directed.

.4 Segregating and transporting all recovered non-hazardous debris for processing as indicated and as directed.

.5 Processing materials in preparation for landfilling the materials

.6 Transferring and stockpiling the processed materials at the base of the Main Landfill in preparation for landfilling the materials

.7 Backfilling, track-packing and re-grading all excavations resulting from exposing buried debris.

.8 Non-hazardous debris material shall be cut to sizes no more than 3 m long, 300 mm high and 500 mm wide prior to disposal in AEC-3.

1.8 PROTECTION

.1 Perform all Work safely and in accordance with the contract documents.

.2 Ensure that demolition Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Burning debris is strictly forbidden on site.

.4 Do not dispose of contaminated water or other wastes into watercourses. Ensure proper disposal procedures are maintained throughout the Project.

.5 Control disposal or runoff of water containing suspended sediments or other harmful substances by collecting and directing the water to a pre-determined pit or other measures as approved by the Departmental Representative.

1.9 MEASUREMENT AND PAYMENT

.1 Include all direct costs for work and services required to excavate, collect, move, sort and process (i.e. cut up and prepare) an estimated 100 m^3 from AEC-1 and an estimated 750 m^3 from AEC-2 of non-hazardous material to the Temporary Working Area (TWA) north of AEC-1. This item will include sorting and processing the wastes and transferring these to a stockpile at the base of the Main Landfill. This will work will be paid on the basis of a unit price per cubic metre. The volume will be measured in the containers used to transport the processed material from the TWA to the base of the Main Landfill. The work will be paid under Item 2.1 in the Unit Price Table.

.2 Include all direct costs for work and services required to move, consolidate, sort and process (i.e. cut up and prepare) and stockpile an estimated 1,550 m^3 non-hazardous material from throughout AEC-3 at the base of AEC-3 - the Main Landfill. The volume will be measured using appropriate techniques (e.g. tape measure and/or total station and/or GPS surveys) as agreed by the Departmental Representative, to survey temporary stockpiles of the processed material at the base of the Main Landfill prior to landfilling the material. The work will be paid under Item 2.2 in the Unit Price Table.

Part 2 PRODUCTS

2.1 EQUIPMENT

.1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

.2 Equipment and heavy machinery to meet all applicable emission requirements and operate in compliance with applicable Federal and Territorial regulations and standards.

Part 3 EXECUTION

3.1 PREPARATION

.1 Inspect site with the Departmental Representative and verify extent and location of non-hazardous materials designated for removal and stockpiling/caching.

.2 Provide erosion control.

.3 Locate stockpiled materials to eliminate cross contamination and double handling wherever possible.

.4 Prior to non-hazardous debris collection, remove hazardous materials defined by all authorities having jurisdiction, as per contract documents.

.5 The hazardous materials to be removed from site and disposed of in a facility licensed to receive and process such materials as outlined in the contract documents.

3.2 HANDLING, SEGREGATION AND STOCKPILING OF DEBRIS

.1 Completely remove all surface and partially buried debris from AEC-1 and AEC 2 and place in Temporary Working Area north of AEC-1, unless otherwise directed by Departmental Representative.

.2 Completely remove all surface debris from AEC-3 and place in Temporary Working Area at the base of the Main Landfill unless otherwise directed by Departmental Representative.

.3 Advise Departmental Representative of any stained soil encountered during debris removal operations. If authorized by Departmental Representative, excavate stained and contaminated area identified during debris removal operations. Testing for classification and confirmatory testing will be carried out and paid for by Departmental Representative.

.4 Transport and stockpile all non-hazardous materials from AEC-1 and AEC-2 to the Temporary Working Area north of AEC-1, for segregating and processing.

.5 Segregate all collected debris into three waste streams:

.1 Non-Hazardous Materials.

.2 Solid Hazardous Materials, per Contract Documents.

.3 Liquid Hazardous Materials, per Contract Documents.

.6 Containerize and prepare for shipping all liquid and solid hazardous materials as outlined in Contract Documents. (**Note** - payment for this work is made under a separate item)

.7 Reduce size and shape of non-hazardous materials, as practical, to facilitate ease of packaging, transport, stockpiling and consolidation in AEC-3.

.8 For placement in landfill at AEC-3 cut all material and debris as required:

.1 Large equipment/vehicles shall be cut to length and reduced in volume at the recommendation and discretion of the Departmental Representative.

.2 All remaining non-hazardous debris material shall be cut to sizes no more than 3 m long, 300 mm high and 500 mm wide.

.9 Transport all processed non-hazardous material stockpiled wastes from the Temporary Working area north of AEC-1 to a stockpile area at the base of the Main Landfill at AEC-3 as indicated in the contract documents. Stockpile all processed wastes from AEC-3 with all non-hazardous processed wastes from AEC-1 and AEC-2 of similar nature at the base of the Main Landfill prior to landfilling these materials

.10 The contractor shall carry out all construction operations within the work areas in a workmanlike manner so as to minimize damage to the sites, and shall, after such work, restore the site to the original level and condition.

3.3 RESTORATION

.1 All areas within the work area used for site storage, temporary stockpiles or remedial Work, must be returned to original conditions for use at no extra cost to the Owner or the Departmental Representative.

.2 Use procedures that are not harmful to health, are not injurious to vegetation, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 41 13 - Selective Site Demolition- Non Hazardous Materials

.2 Section 02 81 01 - Hazardous Materials

.3 Section 31 05 16 - Aggregate Materials

.4 Section 31 22 15 – Grading

1.2 SUMMARY

.1 Section includes work related to the management of petroleum hydrocarbon and/or PCB contaminated and/or metal impacted soils and/or sediments within AEC-1 and AEC-2 as indicated.

.2 Work Includes:

.1 Co-ordination, supervision and preparation for treatment of contaminated soil.

.2 Provision and installation of materials and equipment necessary to remediate site.

.3 Implementation of safety work zones, site Health and Safety Plans, and Emergency Response Plans.

.4 Assurance that soil remediation program has no lasting impact on the environment.

.5 Backfilling of excavations and site restoration will be as per Section 31 22 15 Grading, and not part of the work described herein.

.3 Payment for work will be on a unit rate basis as identified herein.

1.3 REFERENCES

.1 Applicable environmental and health and safety laws and regulations for Territory of Nunavut. In cases where divergent or conflicting codes exist, apply the most stringent code.

.2 Canadian Council of Ministers of the Environment (CCME) Documentation.

.3 Canadian Soil Quality Guidelines for the Protection of Environmental and Human Health (PEHH) by Canadian Council of Ministers of the Environment (CCME), 2007.

.4 Applicable environmental and health and safety laws and regulations for the Nunavut Territory.

.5 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA)

1.4 DEFINITIONS

.1 Hydrocarbon contaminated material (HCM): soil or sediment having concentrations of benzene, toluene, ethylbenzene and xylenes (BTEX) parameters above the CCME BTEX standards, and/or petroleum hydrocarbons

above the CCME CWS values for F1 Fractions, F2 Fraction, F3 Fraction, and F4 Fraction.

.2 Metal contaminated material: soil or sediment having concentrations of one or more metal parameters above the CCME commercial values.

.3 PCB contaminated material: soil or sediment having concentrations of one or more metal parameters above the CCME commercial values.

.4 Free Product: The presence of a layer of separated phase liquid petroleum hydrocarbon product.

.5 Clean Material: Material that has been sampled, analyzed, and determined to have petroleum hydrocarbon fraction or metal concentrations below the site Standards outlined above.

1.5 DESCRIPTION

.1 This section specifies the requirements for the excavation and disposal of contaminated material (soils and/or sediments), including the following:

.2 Hydrocarbon contaminated material.

.1 Excavation, loading, and hauling to a Temporary Working Area north of AEC-1, and disposal/treatment off-site of approximately 400 m^3 of hydrocarbon contaminated soils from AEC 1 as identified on the contract documents.

.2 Excavation, loading, and hauling to a Temporary Working Area north of AEC-1, and disposal/treatment off-site of approximately 100 m^3 of hydrocarbon contaminated soils from AEC-2 as identified on the contract documents.

.3 Cleanup standards as per Article 1.4.

.3 Metal contaminated material.

.1 Excavation, loading, hauling and disposal in AEC 3 landfill of approximately 200 m^3 of metals contaminated soils from AEC 1 as identified on the contract documents

.2 Excavation, loading, hauling and disposal in AEC-3 landfill of approximately 100 m^3 of metals contaminated soils from AEC-2 as identified on the contract drawings

.3 Cleanup standards as per Article 1.4.

.4 PCB contaminated material.

.1 Excavation, loading, and hauling to a Temporary Working Area north of AEC-1, of approximately 100 m^3 of hydrocarbon contaminated sediments from AEC-2 as identified on the contract documents.

.2 Packaging/containerizing, transferring to and disposal of all PCB contaminated materials at an appropriately facility in southern Canada.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

1.7 QUALITY ASSURANCE

.1 Be thoroughly familiar with and knowledgeable about existing site conditions scope of work and requirements of the Specification.

.2 Only Contractor's personnel capable of demonstrating a history of satisfactory experience in the area of excavation and remedial works and who can satisfy Federal and Territorial requirements will be permitted to carry out the work of this Section.

.3 Follow at all times, guidelines such as those established in Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: NIOSH Publication No. 85-115, or Hazardous Waste Worker Training Manual: Canadian LIUNA - Contractors Training Council, 1992.

.4 All activities involving the handling of hazardous materials, including Hazardous Contaminated Soils, are to be directly supervised by the Contractor’s personnel who have successfully completed a 40 hour training course for Hazardous Waste Activities in compliance with OSHA 29 CER 1910.120 or other approved equivalent training courses such as the Canadian Hazardous Waste Workers Program.

.5 Contractor’s personnel trained as described in this Section are to instruct and direct all workers with respect to the waste management procedures and labour and safety practices to be followed in carrying out the work.

.6 Provide workers and the Departmental Representative’s staff, when required, with protection appropriate to the potential type and level of contaminant exposure. Establish specific safety protocols prior to commencing clean up activities.

.7 Provide suitable safety clothing and equipment as required during the course of the work.

.8 Trained and certified personnel are required to complete all Transportation of Dangerous Goods Act (TDGA) documentation and recording requirements.

.9 Field Samples:

.1 Departmental Representative will be responsible for the collection and testing of soil remediation verification samples.

.2 Support Departmental Representative in the collection of verification samples.

.3 The Departmental Representative will advise the contractor in writing of the results of verification testing in advance of site restoration work.

.4 The Departmental Representative will be responsible for the cost of all remediation verification samples required.

1.8 DELIVERY, STORAGE, AND HANDLING

1.9 SITE CONDITIONS

.1 Review the Phase III ESA prepared by Franz, dated 2010 that the extent of known Contaminated materials on-site (for information purposes only).

.2 Review the Revised Remedial Action Plan prepared by Arcadis, dated 2017 with regards to the known contaminated areas and locations on-site (for information purposes only).

.3 No known underground services are present on-site. Prevent damage to above grade utility services.

.4 Suspend operations whenever climatic conditions are unsatisfactory for excavating or regrading to conform with this Specification.

.5 After occurrence of heavy rains, do not operate equipment in designated areas until the material has dried sufficiently to prevent excessive rutting.

.6 The Contractor is advised that the ground in low-lying areas may often be saturated. Dewater saturated ground and ponded areas as required, complying with the by-laws of Iqaluit and Territorial Guidelines. Discharge to tributaries of the Sylvia Grinnell River will not be permitted.

.7 Prior to the commencement of the work, remove snow, ice and standing water from areas to be excavated.

.8 During excavation of contaminated soil, maintain a stable excavation and dewater as required or as directed by the Departmental Representative.

1.10 SEQUENCING

.1 Not used.

1.11 MAINTENANCE

.1 Not used.

1.12 PROTECTION

.1 Prevent damage to existing structures not part of this work. Immediately repair or replace any damage to the above, at no cost to the Departmental Representative or Owner.

.2 Environmental protection measures are to be in accordance with the requirements specified in Section 01 35 43 - Environmental Procedures.

.3 Prevent damage to existing services, i.e. hydro lines.

.4 The release of all water resulting from the dewatering of ponded contaminated soil areas and the decontamination of excavation equipment is to be free from sediment and conform to applicable Territorial Discharge Criteria, as agreed upon by the Departmental Representative. Discharge to tributaries of the Sylvia Grinnell River will not be permitted.

1.13 PERSONNEL PROTECTION

.1 Some areas designated for cleanup under this contract involve soils which contain hydrocarbons, which are considered hazardous to human health.

.2 When working with hydrocarbons, and other contaminants, workers are to wear protective clothing and equipment acceptable to Labour Canada or Territorial Labour Department as suitable for exposure in the work area. Follow National Institute for Occupational Safety and Health (NIOSH) guidelines in providing protection for on-site personnel including contract employees and subcontractor, the Departmental Representative and other authorized site personnel. Provide details of protective clothing and equipment required for each work area in the Site Specific Health and Safety Plan as required by Section 01 35 32 - Site Specific Health and Safety Plan.

.3 Supply sufficient quantities of designated protection equipment to fit all site personnel including the Departmental Representative and authorized visitors. Educate workers and visitors as to risks, and train in safe work practices.

1.14 MEASUREMENT AND PAYMENT

.1 The excavation and transport of Hydrocarbon Contaminated Material to an approved disposal/treatment facility in the vicinity of Iqaluit will be measured for payment by cubic metres measured in the containers used to transfer the material off site to the disposal/treatment facility and then confirmed by the facility receiving the contaminated soil. See Item 2.3 in the Unit Price Table.

.2 The excavation and transport of Metal Contaminated Soil to the AEC-3 Main Landfill for disposal will be measured for payment by the cubic metre as measured in the containers transferring the material between AEC-1, AEC-2 to the AEC-3 See Item 2.4 in the Unit Price Table.

.3 The excavation and transport of PCB Contaminated Sediment to the AEC-3 Main Landfill for disposal will be measured for payment by the cubic metre as measured in the containers transferring the material between AEC-2 to the Temporary working area north of AEC-1. See Item 2.5 in the Unit Price Table.

.4 The packaging in appropriate containers, transport and disposal of PCB Contaminated Sediment at an appropriate licensed disposal location in southern Canada will be measured for payment by the cubic metre as measured in the containers transferring the material from the Temporary Working Area to southern Canada. See Item 2.6 in the Unit Price Table.

.5 The following activities are considered incidental to the work identified by payment Items 2.3 to 2.6 and will not be measured separately:

.1 Equipment decontamination including preparation and operation of the equipment decontamination area.

.2 Dewatering of ponded contaminated soil areas, as required.

.3 Dewatering of groundwater from contaminated soil areas, as required

.4 Supply, installation and operation of materials and equipment for a water management and collection system as required

.5 Record Keeping.

.6 Provision of all necessary safety equipment and clothing.

.7 Excavation and backcasting of clean soil overlying areas of contaminated material at the direction of the departmental representative

.8 Installation of environmental controls, such as silt fences etc.

.9 Excavation of contaminated soils from within permafrost-affected zones.

.10 Excavation, transport, and disposal of unknown non-hazardous debris to the AEC-3 Main Landfill.

.6 No extra payment will be made for soil removal from beyond the specified limits of excavation, unless such removal has been specifically directed by the Departmental Representative. The volume of contaminated soil excavation beyond the specified limits that have been approved by the Departmental Representative will be determined by the measured volume in the container.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Not used.

2.2 EQUIPMENT

.1 Not used.

Part 3 EXECUTION

3.1 EXCAVATION OF CONTAMINATED MATERIAL

.1 Lay out excavation area of contaminated soil to the limits as indicated. The layout is to be field verified by the Departmental Representative prior to excavation. Survey and record on record set of drawings the original ground topography

.2 Excavate area of contaminated soil to the limits as indicated

.3 Suppress dust generated during excavation operations with a water spray. Prevent surface water from entering the excavated area.

.4 Dewater ponded contaminated maternal area, as required. Maintain contaminated material excavation free of standing water during soil removal confirmatory sampling and backfilling activities. Manage and treat waste water and comply with the regulatory requirements as indicated in Section 01 35 43 - Environmental Procedures.

.5 When excavating in the vicinity of a drainage course or a body of water, erect silt fences, floating silt curtains and/or containment berms to prevent the release of sediment and deleterious materials into the water.

.6 Clean the excavating equipment including the bucket, tracks etc. of soil clumps and particles prior to demobilizing. Collect and dispose of the removed material in accordance with the contaminated soil designation Take special precautions to mitigate the tracking of contaminated soil over the site area.

.7 Do not operate equipment in contaminated soil areas that have been excavated until the Departmental Representative has confirmed, based on the results of confirmatory testing, that no further excavation of contaminated soil in the area is required.

.8 Once directed by the Departmental Representative, supply granular material to backfill excavation areas to original ground, as specified in Section 31 22 15 - Grading. Survey the ground surface after placement and compaction of the granular fill.

3.2 EROSION, SEDIMENT AND DRAINAGE CONTROLS

.1 Prior to commencement of the work, install temporary erosion, sediment and drainage controls to prevent siltation and disruption of water bodies in accordance with this Section and Section 01 35 43 - Environmental Procedures.

.2 Erosion, sediment and drainage controls are to be maintained during all stages of work.

.3 At the completion of contaminated soil/sediment excavation, remove the erosion sediment and drainage controls, as directed by the Departmental Representative. Dispose of all non-granular erosion, sediment and drainage control materials off-site.

3.3 EQUIPMENT DECONTAMINATION

.1 Decontaminate equipment which comes into direct contact with the contaminated soils by steam cleaning or other means acceptable to the Departmental Representative in a secure area capable of containing the waste generated by the washing operation

.2 Collect and dispose of any contaminated soil that leaks, spills or otherwise leaves the piece of equipment during transport from the area of work to the decontamination area.

.3 Filter liquid waste resulting from the decontamination operation through an oil-absorbent material. Package and dispose of any oil-absorbent material in accordance with TDGA and dispose off-site at a licensed disposal facility.

.4 Treat any waste soil resulting from the decontamination procedure as hydrocarbon contaminated material, and handle accordingly.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 41 13 - Selective Site Demolition - Non-Hazardous Materials

.2 Section 02 61 00 – Soil Remediation

.3 Section 02 82 00.01 - Asbestos Abatement – Minimum Protection

.4 Section 31 05 16 – Aggregate Materials

1.2 SUMMARY

.1 This section specifies the requirements for the collection, containerization, transport and disposal of hazardous waste from AEC-1 and AEC-2.

.2 This section specifies the requirements for the collection, containerization, transport and disposal of visible and accessible hazardous waste from the top, sides and toe of AEC-3. Buried hazardous waste or hazardous waste on the slope of the landfill are to remain in place as part of this contract.

.3 Work Includes: the collection and packaging of hazardous materials from AEC-1, AEC-2 and AEC-3 for transport and disposal to approved hazardous waste disposal/treatment facility, as outlined in the Contract Documents.

1.3 REFERENCES

.1 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.2 Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34.

.3 Transportation of Dangerous Goods Act (TDG Act) 1999, (c. 34).

.4 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400).

.5 Environmental Protection Act, RSNWT (Nu) 1988, c E-7 (Supp)

.6 Water Resources Agreement Act, RSNWT (Nu) 1988, c 17 (Supp)

.7 Nunavut Safety Act RSNWT (Nu) 1988 cS-1

1.4 DEFINITIONS

.1 Hazardous Material: product, substance, or organism that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.2 Hazardous Waste Material: hazardous material no longer used for its original purpose and that is intended for recycling, treatment or disposal. The following items are designated as hazardous:

.1 Asbestos (unbagged).

.2 Batteries.

.3 Solvents.

.4 Antifreeze/Glycols.

.5 Pesticides.

.6 Ozone Depleting Substances.

.7 Transformer oils containing polychlorinated biphenyls (PCB) in excess of 2 ppm.

.8 Hazardous Lead-Amended Painted Material containing leachable lead concentrations in excess of 5 mg/L.

.9 Soils containing Petroleum Hydrocarbons (PHCs) and metals in concentrations above the applicable guidelines.

.10 Miscellaneous Hazardous Materials defined as those materials not classified as above but suspected to fall under the definition of Hazardous Wastes and Materials as specified in this section.

.3 Processing: The sampling, testing, packaging and containerization of suspected Hazardous Waste Materials.

.4 Hazardous Waste Containers: The intermediate container necessary to contain Hazardous Waste Material (solids and liquids) as required by the TDGA.

.5 Marine Shipping Container: The container into which the intermediate containers are placed for the purpose of shipping to a disposal facility.

.6 Temporary Processing Area: The designated area approved by the Departmental Representative for testing, packaging and containerization of waste material. Requirements for the Temporary Processing Area are outlined in this Section.

.7 Temporary Storage Area: The designated area approved by the Departmental Representative for the storage of packaging and/or shipping containers prior to transportation off-site. Requirements for the Temporary Storage Area are outlined in this Section.

.8 Contractor's Designated Hazardous Waste Disposal/Treatment Facility: The Licensed Hazardous Waste Disposal/Treatment Facility designated by Contractor and pre-approved by the Departmental Representative for the disposal of hazardous wastes specified under the provisions of this contract. Contractor must be able to provide documentation from the Designated Hazardous Waste Disposal/Treatment Facility indicating full responsibility for all hazardous waste received from the project site in Iqaluit.

.9 Leachable-Lead Painted Material: Material that is coated with lead-based paint that has been analyzed and determined to contain leachable lead concentrations in excess of 5 mg/L (as specified in TDGA regulations for TCLP test – leachable lead).

.10 Exposed Debris: visible debris on ground surface consisting of hazardous and non-hazardous material in areas as indicated.

.11 Buried Debris: partially visible debris buried to within 1.0 metres (1000 mm) of the ground surface, consisting of hazardous and non-hazardous material in areas as indicated.

.12 Unknown Hazardous Material: Material designated as hazardous in accordance with the definition of Hazardous Waste Material in this section, and which has not been identified for collection and disposal in the contract documents.

1.5 SUBMITTALS

.1 All submittals must be in accordance with the contract documents.

.2 Exhaustive list and quantities of all Hazardous Materials packaged, transported and disposed of at a Departmental Representative approved disposal/treatment facility. List the Hazardous Materials by the following Categories:

- .1 Batteries
- .2 Antifreeze/Glycols
- .3 Fuel/Oils
- .4 Paints
- .5 Ozone Depleting Substances/ CFCs
- .6 Fire Extinguishers
- .7 Pesticides
- .8 Transformers
- .9 Solvents

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, TDGA, the Land Use Permit, and all applicable Federal and Territorial regulations.

.2 During Start-up meeting and in accordance with the Project requirements, review site conditions and provide co-ordination with other Subcontractors.

.3 Arrange for site visit with the Departmental Representative to examine existing site conditions in AEC-1, AEC-2 and AEC-3 work areas, prior to start of Work.

.4 Execute construction occupational health and safety in accordance with the contract documents.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Perform Work in a safe workmanlike manner and in accordance with the contract documents.

.2 Store, handle and manage hazardous materials in accordance with the Land Use Permit, applicable Federal and Territorial laws, regulations, codes and guidelines.

.3 Co-ordinate collection, handling, packaging, and transport of hazardous materials with the Departmental Representative and abide by requirements for labelling under WHMIS and TDG Act and Regulations.

.4 Place materials defined as hazardous in designated containers/packaging, segregated by types, for storage in provided marine shipping containers (already on site) until they can be mobilized, transported and shipped by the Contractor to a Departmental Representative approved landfill or treatment facility.

.5 Handle, transport and store hazardous materials in accordance with CEPA, TDGA, Regional, Territorial and Federal regulations.

1.8 TRANSPORTATION

.1 Transport hazardous materials and wastes in accordance with Federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable Territorial regulations.

.2 If hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with the Departmental Representative.

.2 Ensure compliance with applicable Federal, Territorial and Municipal laws and regulations for generators of hazardous waste.

.3 Use only licensed carriers authorized by authorities having jurisdiction to accept subject material.

.4 Prepare and submit a list of licensed carriers and waste treatment and disposal facilities intended to be used, to Departmental Representative for approval.

.5 Before shipping material obtain written notice from intended hazardous waste treatment or disposal facility it will accept material and it is licensed to accept this material.

.3 Prior to transporting packaged Hazardous Materials, allow for inspection by Departmental Representative. Fix erroneously packaged materials immediately.

.4 Label containers with durable, legible, visible safety marks as prescribed by Federal, Territorial and Provincial regulations.

.5 Ensure that only certified trained personnel handle, offer for transport, or transport dangerous goods.

.6 Provide daily logs of the storage of Hazardous Materials, by type, work area of origin and quantities.

.7 Provide a final log of all Hazardous Materials to be shipped for disposal at the approved landfill.

.8 Provide photocopy of shipping documents and waste manifests to Departmental Representative.

.9 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide photocopy of completed manifest to Departmental Representative.

.10 Report any discharge, emission, or escape of hazardous materials immediately to the Departmental Representative and appropriate provincial authority. Take reasonable measures to control release.

.11 Report spills and accidents immediately to Departmental Representative. Submit a written spill report to Departmental Representative within 24 hours of incident.

1.9 SITE CONDITIONS

.1 Ensure that hazardous material removal Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.2 Do not dispose of wastes into watercourses.

.3 Ensure proper disposal procedures are maintained throughout the Project.

.4 Review the site conditions upon arrival to the site and amend the work plan and schedule accordingly. Submit pending amendments to the Departmental Representative for approval before enacting the modified work plan.

.5 Collect and package hazardous materials from site at the start of the Work and securely store in Contractor supplied shipping containers mobilized and placed in designated Temporary Storage Area by the Contractor.

1.10 SCOPE OF WORK

.1 Scope of activities is as follows but not limited to:

.1 Collect and package batteries.

.2 Collect tires

.3 Collect and package paints.

.4 Collect and package lead amended painted material.

.5 Collect and package electrical equipment containing PCBs.

.6 Inspect barrels in AEC-1, AEC-2, and AEC-3 for the presence of liquid waste. Drain, collect and containerize for off-site disposal any oil, fuel and lubricants encountered.

.7 Inspect any other vehicle tanks or vessels in AEC-1, AEC-2, and AEC-3 for the presence of liquid waste. Drain, collect and containerize for off-site disposal any oil, fuel and lubricants encountered.

.8 Inspect any transformers encountered to verify the presence of transformer oil. Drain, collect and containerize for off-site disposal any transformer oil if present. Once emptied, the transformers may be disposed of in the AEC-3 Main Landfill.

.9 Collect asbestos-containing material and encapsulate per contract documents.

.10 Collect and package miscellaneous hazardous debris identified by the Contractor or Departmental Representative, segregate by type.

.11 On site transport and loading of the packaged hazardous materials to the contractor supplied marine shipping containers mobilized by the contractor.

.12 Off-site transport and loading of supplied shipping containers to the contractor arranged barge for disposal at an approved waste disposal/treatment facility.

1.11 ESTIMATED QUANTITIES

.1 Estimated quantities of hazardous materials identified in the Iqaluit Landfill work areas are as follows:

.1 AEC-1 – Approximately 50 m^3

.2 AEC-2 – Approximately 250 m^3

.3 AEC-3 – Approximately 495 m3

.2 Unknown hazardous waste materials: any unknown hazardous waste materials which might be exposed during the excavation and removal of debris in various areas on site as described herein.

1.12 MEASUREMENT AND PAYMENT

.1 Include all costs for work and services required to move the hazardous material from AEC-1, AEC-2 and AEC-3 to the Temporary Working Area north of AEC-1 where the materials will be managed appropriately. Include costs for work and services required for draining and collecting the fluid hazardous liquid material

from tanks, drums, and transformers and processing (i.e. cutting up and crushing of lead amended paint materials, etc). This item will be paid on a unit price basis for the cubic metres measured in the containers that will be subsequently used to ship the materials to appropriate licensed disposal facilities in southern Canada. See Item 2.7 in the Unit Price Table.

.2 Include all costs for work and services required for packaging in appropriate containers, transferring by sea and land and disposal of the lead amended paint materials, and any other hazardous bulky wastes at appropriate disposal facilities in southern Canada. This item will paid on a unit price basis for the cubic metres as measured in the containers that are used to ship the materials. See Item 2.8 in the Unit Price Table. The volume will be confirmed by an official receipt issued by the receiving disposal facilities.

.3 Include all costs for work and services required for packaging in appropriate containers, transferring and disposal of other various hazardous wastes materials and difficult wastes including liquids, batteries, tires, electrical equipment containing PCBs, and other unknown hazardous wastes (excluding lead amended paint material and asbestos containing wastes) at appropriately licensed disposal facilities. This item will paid on a unit price basis for the cubic metres as measured in the containers that are used to transfer the materials or by the number items disposed. See Items 2.9.1 to 2.9.4 in the Unit Price Table. The volumes and/or number of items disposed will be confirmed by an official receipt issued by the receiving disposal facilities.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Only bring on site quantity of hazardous materials required to perform Work.

.2 Maintain MSDSs in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

2.2 EQUIPMENT

.1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.

.2 Equipment and heavy machinery to meet all applicable emission requirements and operate in compliance with applicable Federal and Territorial regulations and standards.

2.3 HAZARDOUS MATERIALS CONTAINERS

.1 Hazardous Waste Packaging Containers:

.1 Containers are to satisfy the requirements of the TDG Act and Regulations including the requirements for Intermediate Bulk Containers for marine transport of hazardous materials.

.2 Containers are to include all necessary liners to satisfy the TDGA requirements for marine transport.

.3 Ensure that packaging containers selected to be used for shipping (intermediate and marine shipping containers) are acceptable to transporting companies prior to importing them to the site.

.4 Submit details of the containers to the Departmental Representative for review prior to commencement of the Work.

.2 Polyethylene sheeting:

.1 6 mil (0.15 mm) minimum thickness.

.3 Intermediate Containers for storage of Hazardous Waste Materials:

.1 New drums with sealed lids. Select appropriate size and construction (steel, plastic, etc.) based on quantities and type of Hazardous Material.

.4 Contain asbestos in accordance with Contract Documents.

.5 Provide access for the Departmental Representative to inspect all Hazardous Material Packaging as directed by the Departmental Representative.

.6 For transport by cargo vehicle or vessel, package liquids in sealed drums and place drums inside a secondary containment (such as overpacks, or approved equivalent) on pallets and secure them to the pallets to prevent shifting during transportation.

.7 All areas used for site storage, stockpiles or remedial Work, must be returned to original conditions.

Part 3 EXECUTION

3.1 GENERAL REQUIREMENTS

.1 Conduct all work in accordance with all applicable Federal, Territorial, Provincial, and international legislation as applicable.

.2 Inspect site with the Departmental Representative and verify extent and location of hazardous materials designated for removal and disposal.

.3 Establish a Hazardous Material Processing Area (in the designated area north of AEC-1 as outlined in the Contract Documents) for the placement of potentially hazardous waste materials for inspection, testing, classification and packaging, as well as for the consolidation and packaging of barrel liquids and sediments, and for the cleaning of barrels.

.4 Establish a Temporary Storage Area, (in the designated area north of AEC-1 as outlined in the Contract Documents) subject to approval by Departmental Representative, to provide a secure area for Hazardous Waste Material prior to shipment for disposal as described in this Section.

3.2 PROTECTION

.1 Perform work in a safe and environmentally acceptable manner. Comply with requirements of contract documents.

.2 Avoid releasing any hazardous materials into the environment during handling of hazardous waste materials.

.3 Ensure that hazardous materials work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.4 Control disposal or runoff of water containing suspended sediments or other harmful substances by collecting and directing the water to a pre-determined pit or other measures as approved by the Departmental Representative.

.5 In the event of a spill, invoke the Spill Contingency Plan and/or Emergency Response Plan and take appropriate action.

.6 Provide a full range of cleanup and protective equipment at the site to contain and cleanup spills, and protect personnel, as required. The cleanup equipment is to include booms (sorbent and containment), sorbents for cleanup, fire extinguishers for A-B-C fires, overpacks for contaminated soils, pumps, hand shovels, picks and containment barriers such as plastic sheeting. Personnel protective equipment is to include clothing, protective suits, respirators, etc. to comply with potential emergency conditions and in accordance with NIOSH guidelines.

.7 Site personnel handling hazardous waste material are required to wear protective clothing and equipment suitable for exposure in the work area as per Contract Documents.

.8 Establish a Hazardous Material Processing Area (in the designated area north of AEC-1 as outlined in the Contract Documents) for the placement of potentially hazardous waste materials for inspection, testing, classification and packaging, as well as for the consolidation and packaging of barrel liquids and sediments, and for the cleaning of barrels.

.9 Handle materials containing asbestos in accordance with contract documents.

3.3 HAZARDOUS WASTE MATERIAL PROCESSING AND STORAGE AREAS

.1 Establish a Hazardous Waste Material Processing Area in (in the designated area north of AEC-1 as outlined in the Contract Documents) for the purpose of:

.1 Sorting, packaging, sampling, and processing hazardous waste materials; and

.2 Consolidating compatible hazardous liquids and solids in intermediate containers for off-site disposal at the approved landfill.

.2 Establish the Hazardous Waste Material Processing Area north of AEC-1 to:

.1 Be of sufficient size and capacity to accommodate the volume of material to be processed at any one time;

.2 Provide for the sampling, testing, and packaging of hazardous waste materials and wash water;

.3 Minimize the handling of hazardous waste materials;

.4 Isolate hazardous materials and wash water from other Work operations;

.5 Provide access for consolidation, packaging, cleaning of barrels, and transporting containers to the means of transportation;

.6 Be leak-proof and to contain all runoff water, spills, and leaks so as not to contaminate the environment.

.3 Immediately clean up any spills, leaks, or other releases of liquid or sediment from this area in accordance with the contract documents.

.4 Submit details of the Hazardous Waste Material Processing Area to the Departmental Representative for review and approval prior to commencing remediation activities.

.5 Submit details of the containers proposed to be used for handling and storage of hazardous waste materials to the Departmental Representative for review prior to purchasing and mobilizing them to the site. Include all required approvals, as well as a description of the type and volume of containers.

.6 Establish a Hazardous Waste Material Storage Area (in the designated area north of AEC-1) for storage of supplied marine shipping containers in for the purpose of:

.1 Safely storing the Packaged Hazardous Goods to be protected from weather, humans, wildlife and vehicles.

.2 All packaged Hazardous Wastes must be adequately labelled and sealed prior to storing within the marine shipping containers.

.3 No stacking of marine shipping containers will be allowed.

.7 Submit to the Departmental Representative a detailed inventory of the Temporary Storage Area for storage of intermediate containers of hazardous materials that are bind held/stored prior to loading into the marine containers, indicating location and contents of each intermediate container.

3.4 REMOVAL AND SORTING OF HAZARDOUS WASTE MATERIALS

.1 Collect from site all hazardous materials.

.2 Collect all visible miscellaneous debris at the site, transport and dispose of off-site unless otherwise directed by the Departmental Representative.

.3 Reduce size and shape of materials to facilitate ease of packaging, loading, transport and disposal off site.

.4 Advise the Departmental Representative of any stained soils encountered during debris removal operations. Testing for classification will be carried out and paid for by the Departmental Representative.

.5 Continually monitor the remediation operation to identify potentially hazardous material.

.6 Immediately suspend the operation if suspected hazardous material or debris is identified and allow visual confirmation of the nature of the material or debris to be established.

.7 Store suspicious material in a secured area or secured containers, if the nature of the material or debris can’t be confirmed. Advise the Departmental Representative about the findings. Material needs to be held and isolated until the nature of the material is confirmed by the Departmental Representative. Testing for classification will be carried out and paid for by the Departmental Representative.

.8 Take the appropriate action in the event of a spill or other emergency situation.

.9 Have available a full range of cleanup and protective equipment at the site of debris removal to contain and cleanup spills, and protect personnel as required.

.10 Site personnel in the vicinity of the debris removal operations or handling hazardous material are required to wear environmental protection equipment in accordance with NIOSH guidelines.

.11 At the end of each day's work, leave work areas in safe and stable condition.

3.5 CONTAINERIZATION OF LEACHABLE LEAD PAINTED MATERIALS

.1 Collect leachable lead painted materials and place in marine shipping containers in a manner to minimize voids within the container ensuring that no movement of the material will occur during normal conditions of transport.

.2 Distribute the weight of the material evenly across the floor of the container. Do not concentrate heavy loads on small areas of the floor.

.3 Position materials within the container so that the center of gravity is below the half-height of the container.

.4 Position materials within the container such that lateral bracing for the load is not provided by the sidewalls of the container. Provide and use wood bracing material or strapping to ensure the material does not move during transport. Anchor the strapping material to the fastening loops built into the frame of the container. Anchor the bracing material to the structural frame of the container.

.5 Lock marine shipping containers within the Hazardous Waste Material Storage Area in a manner that prevents access to the contents by unauthorized personnel.

.6 Decontaminate all equipment that comes into direct contact with leachable lead based paint during dismantling operations. Place all rags or cloths used during the equipment decontamination in polyethylene bags. Place bags in the Hazardous Waste Materials specified in this Section.

3.6 PACKAGING, LABELLING AND INVENTORY

.1 Provide a numbering system and maintain an inventory of all intermediate and marine shipping containers with Hazardous Waste Materials to be transported and disposed off-site.

.2 Package and label each “hazardous material” in accordance with the Class and Packaging Group as per TDGA.

.3 Submit to Departmental Representative a copy of the inventory of the contents of each marine shipping container prior to transport.

3.7 RESTORATION

.1 Restore temporary processing and storage areas and other areas damaged during Work to match condition of adjacent, undisturbed areas.

.2 Use procedures that are not harmful to health, are not injurious to vegetation, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

Part 1 GENERAL

1.1 RELATED SECTIONS

.1 Section 02 41 13 - Selective Site Demolition- Non Hazardous Materials

.2 Section 02 61 00 – Soil Remediation

.3 Section 02 81 01 - Hazardous Materials

.4 Section 31 05 16 – Aggregate Materials

1.2 REFERENCES

.1 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999 (CEPA).

.2 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.

.3 Asbestos-Containing Materials (ACMs): materials identified under Existing Conditions including fallen materials and settled dust.

.4 Asbestos Work Area: area where Work takes place which will, or may, disturb ACMs.

.5 Authorized Visitors: Departmental Representative, Departmental Representative's Authorized Personnel or designated representatives, and representatives of regulatory agencies.

.6 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.

.7 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for Work.

1.4 SUBMITTALS

.1 Submittals in accordance with contract documents.

.2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.

.3 Submit Provincial, Territorial and/or local requirements for Notice of Project Form.

.4 Submit proof of Contractor's Asbestos Liability Insurance.

.5 Submit to Departmental Representative necessary permits for transportation and storage of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial, Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.

.2 Execute construction occupational health and safety in accordance with the contract documents.

.1 .Safety Requirements: worker protection.

.1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Non-powered reusable or replaceable filter-type respirator equipped with HEPA filter cartridges, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to authorities having jurisdictions.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres, consisting of full-body covering including head covering with snug-fitting cuffs at wrists, ankles, and neck.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, dispose of protective clothing as contaminated waste as specified.

.4 Ensure workers wash hands and face when leaving Asbestos Work Area.

.5 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.6 WASTE MANAGEMENT AND STORAGE

.1 Place materials defined as hazardous in designated containers.

.2 Handling and storage of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.3 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.4 Provide daily logs of ACM handling and storage.

1.7 EXISTING CONDITIONS

.1 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.8 MEASUREMENT AND PAYMENT

.1 Collecting, packaging, transporting to and storing Asbestos Wastes in a designated area within the off site Temporary Working Area north of AEC-1 and subsequently transporting the packages/containers via sea and road to an appropriately licensed facility in southern Canada will paid on the basis of a unit price per cubic metre as measured in the packages/continuers that are used to transport the materials to southern Canada. The volume will be confirmed by an official receipt issued by the disposal facility. See Item 2.10 in the Unit Price Table.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.

.2 Waste Containers: contain waste in two separate containers.

- .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
- .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
- .3 Labelling requirements: affix preprinted cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.

Part 3 EXECUTION

3.1 PROCEDURES

.1 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

- .1 Remove visible dust from surfaces in the Work area where dust is likely to be disturbed during course of Work.
- .2 Use HEPA vacuum, or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
- .3 Do not use compressed air to clean up or remove dust from any surface.

.2 Prevent spread of dust from Asbestos Work Area using measures appropriate to Work to be done.

.3 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed unless wetting creates hazard or causes damage.

- .1 Use garden reservoir type low - velocity fine - mist sprayer.
- .2 Perform Work to reduce dust creation to lowest levels practicable.

.3 Work will be subject to visual inspection.

.4 Clean-Up:

.1 Frequently during Work and immediately after completion of Work, clean up dust and asbestos-containing waste using HEPA vacuum or by damp mopping.

.2 Place asbestos-containing waste in sealed dust-tight waste bags. Treat disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.

.3 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.

.4 Seal waste bags and place for temporary storage in marine shipping containers. Transport off-site to a pre-approved hazardous waste landfill and dispose of in accordance with requirements of Provincial, Territorial and Federal regulations.

.5 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C127-12, Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.

.2 ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ftü (600 kN-m/mü)).

.3 ASTM D4253-00(2006), Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.2 DEFINITIONS

.1 Corrected maximum dry density is defined as:

.1 D = (D1xD2) / ((F1 x D2) + (F2 x D1)).

.2 Where: D = corrected maximum dry density kg/mü.

.1 F1 = fraction (decimal) of total field sample passing 19 mm sieve.

.2 F2 = fraction (decimal) of total field sample retained on 19 mm sieve (equal to 1.00 - F1).

.3 D1 = maximum dry density, kg/mü of material passing 19 mm sieve determined in accordance with Method A of ASTM D698.

.4 D2 = bulk density, kg/mü, of material retained on 19 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127.

.3 For free draining aggregates, determine D1 (maximum dry density) to ASTM D4253 dry method when directed by Departmental Representative.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIRMENTS

.1 Section 31 22 15 - Grading

.2 Section 31 23 33.01 - Excavating, Trenching and Backfilling

.3 Section 31 24 13 – Road and Landfill Embankments

.4 Section 31 37 00 – Rip Rap

1.2 DESCRIPTION

.1 This section specifies the requirements of aggregates to be incorporated into the work as granular fill to regrade AEC-1 and AEC-2; line ditches, swales and streams; and to build an access road/ramp to the top and base of the Main Landfill (AEC-3) and to stabilize and cover the Main Landfill (AEC-3).

.2 The granular materials from sources may need to be blended, and/or screened to satisfy gradation specifications as indicated in this Section.

.3 Moisture conditioning of material from sources may be required.

.4 It is anticipated that there will be a need to process aggregate and place it in working stockpiles, in advance of the work.

1.3 SOURCE APPROVAL

.1 Source(s) of materials to be incorporated into work requires approval by Departmental Representative.

.2 Obtain all necessary approvals from the City of Iqaluit prior to beginning work.

.3 Inform Departmental Representative of proposed source of aggregates and provide access for sampling at least 14 days prior to commencing production. Departmental Representative will conduct confirmatory testing of materials, if required, to determine if any contamination is present.

.4 If, in the opinion of Departmental Representative, materials from the proposed source do not meet, or cannot reasonably be processed to meet specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.5 Should a change of material source be proposed during work, advise Departmental Representative 14 days in advance of proposed change to allow sampling and testing.

.6 Acceptance of a material 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.

1.4 PRODUCTION SAMPLING

.1 Aggregate will be subject to frequent sampling by Departmental Representative during production either at the stockpile or at the place of work. The aggregate is to meet the required specifications regardless of the place of sampling.

.2 Provide Departmental Representative with ready access to source and processed material for purpose of sampling and testing.

.3 Samples are to be obtained according to industry acceptable practices.

1.5 MEASUREMENT AND PAYMENT

.1 Payment for supply of all specified aggregate materials will be made at the unit price per cubic metre based on surveys of each fill zone before and after completion in the cases of Types 2 to 4 materials placed as shown on the drawings and based on truck box measurements for Type 1 materials placed in Fill Zone 1 and on the upper surface (plateau) of the landfill embankment. The unit price shall include all labour, equipment and materials necessary for processing and delivery of aggregate materials to the site to complete the work as specified and shown on the contract drawings.

.2 Include costs for work and services required to supply and deliver to site Type 1 Aggregate materials – fine gravel/sand. See Item 3.1 in the Unit Price Table.

.3 Include costs for work and services required to supply and deliver to site Type 2 Aggregate materials – coarse granular. See Item 3.2 in the Unit Price Table.

.4 Include costs for work and services required to supply and deliver to site Type 3 Aggregate materials – Rip Rap. See Item 3.3 in the Unit Price Table.

.5 Include costs for work and services required to supply and deliver to site Type 4 Aggregate materials – fine granular. See Item 3.4 in the Unit Price Table.

.6 Contractor is responsible for any overages in volume of material not required to do the work.

.7 Payment for placement, compaction and levelling in all fill zones to the lines and levels shown on the drawings will be paid under a separate pay items indicated in sections to follow and in the Unit Price Table.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material or other deleterious substances.

.2 Flat and elongated particles are those whose greatest dimension exceeds five times their least dimension.

.3 Aggregates satisfying requirements of applicable sections are to be prepared and supplied to the site.

.4 **Fine Aggregate: Type 1 Granular Fill**

.1 Type 1 Granular Fill is select material obtained from sources approved by Departmental Representative, generally consisting of a mixture screened sand and fine gravel in an unfrozen state and free from particles larger than 10 mm, waste or other deleterious material.

~~.2~~ Gradation to be within the following limits when tested to ASTM C136 and ASTM C117~~:~~

Sieve Designation	% Pass by Weight
10	100
5	80 to 100
2	40 to 80
1	0 to 68
0.08	0 to 10

.5 **Coarse Aggregate: Type 2 Granular Fill**

.1 Type 2 Granular Fill is select material obtained from sources approved by Departmental Representative, generally consisting of a mixture of cobble, coarse and fine gravel and sand sized particles in an unfrozen state and free from rocks larger than 300 mm, waste or other deleterious material.

.2 Type 2 Granular Fill is used to build an access road/ramp to the top and base of the existing landfill and used to re-grade the ground surface in AEC-1 and AEC-2.

.3 Type 2 Granular Fill will be used as requested by the Departmental Representative in Zone 2 of the Landfill Embankment.

.4 Gradation to be within the following limits when tested to ASTM C136 and ASTM C117÷

Sieve Designation	% Pass by Weight
200	100
150	90 to 100
80	60 to 80
40	30 to 55
20	25 to 40
10	15 to 25
5	12 to 20
2.5	10 to 15
1.25	8 to 12
0.08	0 to 4

.6 **Rip Rap: Type 3 Granular Fill**

.1 Type 3 Granular Fill is select material obtained from sources approved by Departmental Representative, generally consisting of screened stone or gravel in an unfrozen state and free from rocks larger than 210 mm, waste or other deleterious material

.2 Type 3 Granular Fill – Rip Rap will used to sheet the sloping outer surface of the Landfill Embankment (Zone 3) if requested by the Departmental Representative and as required to line ditches and swales.

.3 Gradation to be within the following limits when tested to ASTM C136 and ASTM C117÷

Sieve Designation	% Pass by Weight
250	100
200	95 to 100
150	70 to 90
125	50 to 70
60	0 to 30
40	0

.7 **Road Base: Type 4 Granular Fill**

.1 Type 4 Granular Fill is select material obtained from sources approved by Departmental Representative, generally consisting of fine gravel and sand

in an unfrozen state and free from rocks larger than 40 mm, waste or other deleterious material

.2 Type 4 Fine Granular Fill –Road Base is used to form the upper surface layer of the main Access Road/Ramp and will be used to cover the upper plateau of the Landfill Embankment (Zone 4) as indicated on cross sections presented on Contract Drawings, if requested by the Departmental Representative.

.3 Gradation to be within the following limits when tested to ASTM C136 and ASTM C117÷

Sieve Designation	% Pass by Weight
40	100
25	85 to 100
20	75 to 100
10	50 to 74
5	35 to 60
2	20 to 44
1	10 to 34
0.355	5 to 22
0.08	2 to 10

.8 Materials classified as unsuitable will include:

.1 Non-uniform material of widely varying moisture density characteristics.

.2 Aggregates with moisture content exceeding optimum moisture by 5% or more.

.3 Aggregates containing organic material, snow, ice or other deleterious material.

.4 Frozen material.

Part 3 EXECUTION

3.1 PROCESSING

.1 Process aggregates uniformly using methods that prevent contamination, segregation and degradation.

.2 Blend aggregates if required to obtain the gradation requirements specified. Use methods and equipment that are approved by the Departmental Representative.

.3 Blending to decrease percentage of flat and elongated particles is permitted.

.4 Moisture condition aggregate as required to achieve the specified density and/or degree of saturation.

.5 Dry aggregate as required to provide ease of handling during freezing temperatures or to place and compact according to this Specification.

3.2 HANDLING

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

3.3 STOCKPILING

.1 Stockpile aggregates on site in locations indicated or designated by Departmental Representative.

.2 Stockpiling sites are to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.3 Except where stockpiled on acceptably stabilized areas do not incorporate bottom 300 mm of pile into work.

.4 Separate aggregate stockpiles of different types far enough apart to prevent intermixing.

.5 Reject intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Departmental Representative within 48 hours of rejection.

.6 Stockpile materials in uniform layers of one (1) metre maximum thickness.

.7 Complete each layer over the entire stockpile area before beginning next layer.

.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.9 Coning of piles or spilling materials over edges of pile will not be permitted.

.10 During snowy conditions, prevent ice and snow from becoming mixed into stockpile.

3.4 STOCKPILE CLEANUP

.1 Leave stockpile site in a tidy, well drained condition, free of standing surface water to satisfaction of Departmental Representative.

.2 Leave any unused aggregates in neat compact stockpiles or as directed by Departmental Representative.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This Section specifies requirements for clearing and grubbing, if required and as and where directed by the Departmental Representative.

1.2 MEASUREMENT PROCEDURES

.1 Measure the following items in square metres.
  .1 Clearing and Grubbing.

1.3 REFERENCES

.1 Not used.

1.4 DEFINITIONS

.1 Close-cut clearing consists of cutting off brush, scrub, roots, stumps and embedded logs, removing at, or close to, existing grade and disposing of fallen timber and surface debris.

.2 Grubbing consists of excavation and disposal of vegetation and roots to not less than a depth of 150 mm below existing ground surface.

1.5 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00.

1.6 QUALITY ASSURANCE

.1 Do construction occupational health and safety in accordance with Section 01 35 29.

1.7 STORAGE AND PROTECTION

.1 Prevent damage to fencing, natural features, bench marks, utility lines and water courses which are to remain.
  .1 Repair any damaged items to approval of Departmental Representative.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for disposal in the Main Landfill (AEC-3)

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Soil Material for Fill:

.1 Excavated soil material: free of debris, roots, wood, scrap material, vegetable matter, refuse, soft unsound particles, deleterious, or objectionable materials.

.2 Remove and store soil material for reuse or dispose in the Main Landfill.

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, specific to site.

.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 PREPARATION

.1 Inspect site and verify with Departmental Representative, items designated to remain.

.2 Locate and protect utility lines. Preserve in operating condition active utilities traversing site.

.3 Notify utility authorities before starting clearing and grubbing.

.4 Keep roads free of dirt and debris.

3.3 CLEARING

.1 Clearing includes trimming and satisfactory disposal of vegetation designated for removal, including brush, and rubbish occurring within cleared areas.

3.4 GRUBBING

.1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.

.2 Grub out stumps and roots to not less than 200 mm below ground surface.

.3 Fill depressions made by grubbing with suitable material as directed by

Departmental Representative and to make new surface conform with existing adjacent surface of ground.

3.5 REMOVAL AND DISPOSAL

.1 Remove cleared and grubbed materials to disposal area designated by Departmental Representative.

.2 Dispose of cleared and grubbed materials by burying.

.4 Bury to approval of Departmental Representative by:
- .1 Consolidating.
- .2 Covering with minimum 500 mm of mineral soil.
- .3 Finishing surface.

3.6 FINISHED SURFACE

.1 Leave ground surface in condition suitable for immediate grading operations and stripping of topsoil to approval of Departmental Representative.

3.7 CLEANING

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

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Not used.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

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 according to sediment and erosion control plan, specific to site.

.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 STRIPPING OF TOPSOIL

.1 Ensure that procedures are conducted in accordance with applicable Territorial requirements.

.2 Remove topsoil before any construction procedures commence to avoid compaction of topsoil.

.3 Remove vegetation from targeted areas by non-chemical means and dispose of stripped vegetation in the Main Landfill.

.4 Remove brush from targeted area by non-chemical means and dispose in the Main Landfill.

.5 Strip topsoil to depths as directed by Departmental Representative.

.6 Pile topsoil by mechanical hoe in berms in locations as directed by Departmental Representative. Stockpile height not to exceed 2.5 - 3 m.

3.3 PREPARATION OF GRADE

.1 Not used.

3.4 PLACING OF TOPSOIL

.1 Place topsoil only after Departmental Representative has accepted subgrade.

.2 During dry conditions spread topsoil by mechanical hoe in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water.

.3 Establish traffic patterns for equipment that will prevent driving on topsoil after it has been spread to avoid compaction.

.4 Cultivate the soil following spreading procedures.

3.5 SUB-SOILING

.1 Not used.

3.6 CLEANING

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

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 05 16 - Aggregates

.2 Section 31 23 33.01 - Excavating, Trenching and Backfilling

.3 Section 31 24 13 – Road and Landfill Embankments

.4 Section 31 37 00 – Rip Rap

1.2 DESCRIPTION

.1 This Section specifies requirements for:

.1 Relocation of prepared non-hazardous material from stockpiles, located at the base of AEC-3, for disposal and burial in Zone 1 of the Main Landfill (AEC-3).

.2 Placement and compaction of prepared non-hazardous materials mainly metal contaminated soils and sediments, and cut up metal debris and Type 1 granular fill materials in Fill Zone 1 of the Landfill Embankment

.3 The provision, maintenance, removal and restoration of ground surfaces and temporary access routes into working areas from the primary site access road.

.4 Re-shaping and re-grading of the AEC-1 as indicated.

.5 Re-shaping and re-grading of the AEC-2 as indicated.

.2 This Section does not include upgrading and constructing the main access road and ramp to the base of AEC-3 – the Main Landfill as shown on the contract drawings.

.3 There will be no extra payment for the provision, maintenance, removal and restoration of temporary access routes into working areas from the primary site access road. The cost of this work and any other site or ground surface maintenance work in any of the areas AEC-1, AEC-2 and AEC-3 should be included in the Lump Sum - Balance of Projects.

1.3 DEFINITIONS

.1 Re-shaping: The leveling and grading of designated areas to blend in with the natural terrain and provide positive drainage. Re-shaping does not require the supply and placement of additional materials.

.2 Re-grading: The leveling and grading of designated areas and which includes the supply and placement of additional aggregate (fill) to blend in with the natural terrain and provide positive drainage.

.3 Compaction: Given the nature of the material available a performance based specification has been provided for the compaction of the fill used as part of the remediation program. The performance based specifications are as indicated.

.4 Source Material: Material obtained from approved sources and required for grading work.

.5 Specific classifications of granular materials are described in the contract documents.

1.4 SITE CONDITIONS

.1 Ensure that all work under this section meet the terms and references of applicable operations-use permits for the respective work areas within the site.

.2 Suspend operations whenever climatic conditions are unsatisfactory for grading to conform to this Specification.

.3 Only operate equipment in work areas where materials are sufficiently dry to prevent excessive rutting.

.4 Areas to be graded are to be free from debris and excessive snow, ice or standing water.

.5 Where possible, existing access routes are to be used during remediation activities and may require repair and upgrading during the course of the work.

1.5 PROTECTION

.1 Environmental protection measures are to be in accordance with Contract Documents. Follow the approved Erosion, Sediment and Drainage Control Plan submitted in accordance with Contract Documents.

1.6 SAMPLES

.1 Inform Departmental Representative of proposed sources of fill materials and provide access for sampling. Give a minimum of three weeks (21 days) notice to allow for laboratory analysis of initial samples.

1.7 MEASUREMENT AND PAYMENT

.1 The cost of site preparation and maintenance grading of the areas (AEC-1 to AEC-3) as required for the grading work at the respective work areas will be included in the Balance of Project Costs-Lump Sum. Diversion and draining to keep areas free of standing water comprises part of the site preparation and maintenance general grading work. Any clearing, grubbing and stripping including loose cobbles and boulders to facilitate work will be included in this item of work.

.2 The cost of upgrading and maintenance of site routes to access work areas (except the upgrading of the main access road to the base of AEC-3 as shown on the contract drawings) will be included in the Balance of Project Costs Lump Sum. Use existing site accesses to the extent possible and minimize the construction of new routes. Any clearing, grubbing and stripping including loose cobbles and boulders to facilitate work comprises part of the upgrading and maintenance work.

.3 Include all direct costs for work and services required for construction of the temporary working areas, storage areas etc. to be paid under Item 3.5, in the Unit Price Table. Any clearing, grubbing and stripping including loose

cobbles and boulders to facilitate work will be included in the price for this item.

.4 Re-shaping and re-grading of the existing AEC-1 area, as indicated, will be paid on a square metre basis where Type 2 granular has been placed, compacted and levelled as agreed by the Departmental Representative. See Item 3.6, in the Unit Price Table.

.1 The supply of aggregate and payment for it will be as per Section 31 05 16 – Aggregate

.2 Supply and placement and erosion control measures as per conditions outlined in contract documents shall be included

.5 Re-shaping and re-grading of the existing AEC-2, as indicated, will be paid as on a square metre basis where Type 2 granular has been placed, compacted and levelled as agreed by the Departmental Representative as indicated under Item 3.7, in the Unit Price Table.

.1 The supply of aggregate and payment for it will be as per Section 31 05 16 – Aggregate

.2 Supply and placement of erosion control measures as per conditions outlined in Contract Documents shall be included

.6 Payment for loading non-hazardous solid wastes including metal debris and metal contaminated soils and sediments and Type 1 aggregate from temporary stockpiles at the base of AEC-3 transferring the materials, placing and compacting the materials in Zone 1 will be paid on a cubic metre basis. The in place volume will determined based on topographic surveys of the original ground surface at the base of the Main Landfill and following completion of Zone 1 and using the end area method of computing volumes and/or digital terrain models of the two surveyed ground surfaces. See Item 3.8 in the Unit Price Table.

.1 Delivery of all recovered and prepared non-hazardous wastes to the base of AEC-3 is paid under other items in the Unit Price Table as indicated in the contract documents. Provision of Type 1 fill is paid under a separate item in the Unit Price Table and as indicated in the contract documents.

.7 Re-shaping and re-grading of AEC-2 drainage channel will be paid on a cubic metre basis where Type 3 granular has been placed and levelled as agreed by the Departmental Representative as indicated under Item 3.25 in the Unit Price Table. Specified geotextile placed between native and/or fill materials and the rip rap will be paid under Item 3.22.

.1 The supply of aggregate and payment for it will be as per Section 31 05 16 – Aggregate

.2 Supply and placement of erosion control measure as per conditions outlined in the Contract Documents shall be included.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Material used for the re-grading of the AEC-1 and AEC-2 areas, and other work areas, requires the approval of Departmental Representative.

.2 Non Hazardous wastes to be landfilled and aggregate materials to be used are to be prepared as per the specifications outlined in contract documents.

Part 3 EXECUTION

3.1 GENERAL SITE GRADING AND MAINTENANCE

.1 Grade and maintain work areas as required in preparation of the work at the respective landfill locations.

.2 Maintain natural drainage patterns and keep areas free of standing water.

3.2 UPGRADING AND MAINTENANCE OF ACCESS ROUTES

.1 Upgrade and maintain access routes to facilitate work using existing access routes to the extent possible.

.2 Ensure drainage of access routes and adjacent lands to provide surface drainage. Where necessary, cut swales to channel surface drainage in such a manner as to minimize surface erosion.

3.3 WORK NEAR WATER BODIES

.1 Erosion and Sediment Control measures, as outlined in Contract Documents, are to be implemented as required to ensure that sediment or erosion produced do not enter the adjacent water bodies.

3.4 TEMPORARY STAGING AND STORAGE AREAS

.1 Develop Temporary Working Areas etc. for sorting, processing and management of materials in designated areas, one in an off site area located north of AEC-1 and one may be located within AEC-3.

.2 Prepare the Temporary Working Areas to comply with the following:

.1 Provide easy access to the off-site transport equipment. For the purposes of this contract a 30 m by 30 m area is to be assumed; however, may be larger in size upon approval of the Departmental Representative.

.2 Allow the equipment and packaging containers to be level and distribute the weight of the containers evenly to the supporting surface.

.3 The area is to be free of standing water.

.4 Surface water run-on to the area must be minimized. The area must not be subject to flooding, excessive snow drifting, and/or seasonal saturation.

.5 Sufficiently compact the area so as to prevent the containers from settling into the ground. Supply, place and compact additional coarse aggregate as required.

.6 Locate at least 30 m from any body of water.

.7 In an area routinely accessed or essential to Contractor's workforce or site personnel.

.8 More than 30 metres away from flammable materials.

.9 Set timbers or another form of base to ensure that containers used to package non-hazardous and hazardous materials going off-site do not freeze to the ground prior to demobilization from site.

.10 Within the Temporary Working Areas, segregate the various types of materials as described in contract documents.

.11 Provide signage for Temporary Working Areas in accordance with contract documents.

.12 Erect a barricade to demarcate the limits of the Temporary Working Areas.

3.5 PLACING NON HAZARDOUS DEBRIS IN THE LANDFILL

.1 Place non-hazardous cut up/crushed debris flat and contaminated soils and sediments relocated from AEC-1 to AEC-3 along the toe of the landfill in uniform, horizontal lifts in the area delineated as Zone 1 in the plan and cross sections contract drawings. The thickness of each waste lift is to be such that all voids within the waste can be filled with fine aggregate material. The maximum thickness of each waste lift is not to exceed 500 mm.

.2 Compact waste during placement by making passes with a bulldozer and then if possible with a smooth drum compactor (5,000 kg) or approved alternative during placing and spreading of the waste material. The equipment must be capable of crushing demolition debris.

.3 Place Type 1 granular fill to infill any voids in the waste layer a maximum loose thickness of 300 mm over each layer of non-hazardous material. Compact the lift of materials comprising solid wastes and Type 1 fill with a bull dozer (Caterpillar D8 or heavier) and, if possible with a smooth drum compactor (5,000 kg) or approved alternative.

.4 Compact each layer to completely infill voids within the waste layer prior to proceeding with placement of the next overlying waste layer and prior to placement of the final cover of 500 mm of Type 1 fill on the upper surface of Zone 1 to elevation 13.0 metres

.5 Grade the slope face area as indicated in the contract documents.

3.6 RE-SHAPING AND RE-GRADING OF AEC-1 AREA

.1 Place a minimum of 300 mm of Type 2 aggregate as indicated.

.2 Place aggregate in loose lifts not to exceed 300 mm.

.3 Compact the granular fill a by making a minimum of six passes per lift using a small dozer (10,000 kg).

.4 Grade the granular fill at the end of each work day to promote drainage.

.5 Grade the granular fill to blend in with the natural terrain and provide positive drainage.

3.7 RE-SHAPING AND RE-GRADING OF AEC-2 AREA

.1 Place a minimum of 300 mm of Type 2 aggregate as indicated.

.2 Place the granular fill in loose lifts not to exceed 300 mm.

.3 Compact the granular fill by making six passes per lift using a small dozer (10,000 kg).

.4 Grade the area to promote drainage.

.5 Grade the granular fill to blend in with the natural terrain and provide positive drainage.

3.8 SITE RESTORATION OF WORKED AREAS IN AEC-1 TO AEC-3

.1 Re-shape and re-grade worked areas and depressions created by the removal of debris, and contaminated soil.

.2 Ensure drainage of restored areas to maintain natural drainage patterns and keep areas free of standing water.

3.9 MAINTENANCE

.1 Maintain finished surfaces in a condition in accordance with this Section until demobilization.

3.10 SITE SURVEYS

.1 All work areas are to be surveyed prior to the commencement of work with a hardcopy and electronic copy (in AutoCAD format) of the survey provided to the Departmental Representative.

.2 All work areas are to be surveyed upon completion of the remediation work with a hardcopy and electronic copy of the survey provided to the Departmental Representative.

.3 The electronic survey files are to be provided in an AutoCAD 2014 compatible format.

.4 Temporary bench marks are to be established and maintained for the duration of the project.

3.11 TESTING

.1 Frequency of testing will be determined by Departmental Representative.

3.12 FINISHING AND TOLERANCES

.1 All areas to be covered with granular material are to be uniform without projections or depressions exceeding 100 mm in three (3) metres.

.2 Granular fill surfaces to be within 100 mm of design elevations but not uniformly high or low.

.3 Finished surface are to be graded to promote positive drainage and minimize standing water.

END OF SECTION

PART 1 – GENERAL

1.1 DESCRIPTION

.1 This Section specifies requirements for excavating and trenching for swales at the base of the rehabilitated Main Landfill (AEC-3) and ditches and culverts along the site access roads and backfilling culverts.

1.2 MEASUREMENT AND PAYMENT

.1 Excavated materials will be measured in cubic metres in their original location based on appropriate ground surveys as agreed with the Departmental Representative.

- .1 Common excavation quantities measured will be actual volume removed within following limits:
  - .1 Width for trench excavation as indicated.
  - .2 Depth from ground elevation immediately prior to excavation, to elevation and side slopes as directed by Departmental Representative.
- .2 Rock quantities measured will be actual volume removed within following limits:
  - .1 Width for trench excavation as indicated.
  - .2 Depth from rock surface elevations immediately prior to excavation, to elevation as indicated.
  - .3 Where design elevation is less than 300 mm below original rock surface, depth will be considered to be 300 mm below original rock surface.
  - .4 Volume of individual boulders and rock fragments will be determined by measuring three maximum mutually perpendicular dimensions.

.2 Shoring, bracing, cofferdams, underpinning and de-watering of excavation will not be measured separately for payment.

.3 Backfilling to authorized excavation limits will be measured in cubic metres compacted in place for each type of material specified.

.4 Payment of excavations of common ground and rock including any minimal topsoil made to form swales and ditches along the access road and on the edges of the rehabilitated Main Landfill including along the eastern side of the existing upper landfill surface adjacent to the proposed Ditch D-2 as shown on the contract drawings, will be made on a cubic metre basis. See Items 3.9 and 3.10 in the Unit Price Table.

.5 Payment of placement geotextile and rip rap to line ditches and swales as directed by the Departmental Representative will be made on the basis of cubic metres and square metres placed, respectively. See Items 3.22 and 3.25 in the Unit Price Table. The supply of materials will be made under separate items in the Unit Price Table.

.6 Payment for installation of culverts will be made under a separate item in the Unit Price Table.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
- .1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
- .2 ASTM C136/C136M-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .3 ASTM D422-63(2007) e2, Standard Test Method for Particle-Size Analysis of Soils.
- .4 ASTM D698-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ü) (600 kN-m/m ü).
- .5 ASTM D1557-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ü) (2,700 kN-m/m ü).
- .6 ASTM D4318-10e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.
- .2 CAN/CSA-G401-14, Corrugated Steel Pipe Products.

.3 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
- .1 OPSS 1004 November 2012, Ontario Provincial Standard Specification, Material Specification for Aggregates - Miscellaneous.
- .2 OPSS 1010 April 2013, Ontario Provincial Standard Specification, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.4 U.S. Environmental Protection Agency (EPA)/ Office of Water
- .1 EPA 833-R-06-004, May 2007, Developing Your Stormwater Pollution Prevention Plan - A Guide for Construction Sites.

1.4 DEFINITIONS

.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^3 and which cannot be removed by means of heavy duty mechanical excavating equipment with 0.95 to 1.15 m^3 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 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.

.3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.6 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 D4318, and gradation within limits specified when tested to ASTM D422.

.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.

.7 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 SUBMITTALS

.1 Make submittals in accordance with Section 01 33 00.

.2 Quality Control:

.1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article of this Section.

.2 Submit for review by Departmental Representative proposed dewatering methods as described in PART 3 of this Section.

.3 Submit to Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.4 Submit to Departmental Representative written notice when bottom of excavation is reached.

.5 Submit to Departmental Representative testing and inspection results and report as described in PART 3 of this Section.

.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 existing utilities as found in field and clearance record from utility authority.

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00.

.2 Inform Departmental Representative at least 3 weeks prior to beginning Work, of proposed source of fil materials and provide

access for sampling.

.3 Take samples with the Departmental Representative

.4 Submit samples of type of fill specified including representative samples of excavated material.

.5 Ship samples prepaid to Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.6 QUALITY ASSURANCE

.1 Submit design and supporting data at least 2 weeks prior to beginning Work.

.2 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in the Territory of Nunavut.

.3 Keep design and supporting data on site.

.4 Do not use soil material until written report of soil test results are reviewed by Departmental Representative.

.5 Health and Safety Requirements:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.14.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for burial in Zone 1 of the Main Landfill Embankment.

.2 Divert excess aggregate materials for reuse on the site 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. None are expected.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Prior to beginning excavation Work, notify Departmental Representative and applicable authorities having jurisdiction establish location and state of use of buried utilities and structures. Departmental Representative and authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.4 Maintain and protect from damage, all utilities.

.5 Record location of maintained, re-routed and abandoned underground lines.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Types 1 to 4 granular fill: properties to Section 31 05 16 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 C136/C136M and ASTM C117. Sieve sizes as per Section 31 05 16
.2 Granular material: to Ontario Provincial Standard Specification 1010 for:
  .1 Granular A, maximum size 19.0 mm.
  .2 Granular B, Type II, maximum size 150 mm.
  .3 Granular M, maximum size 19.0 mm.
.3 Sand: clean, washed, minimum 100% passing 4.75 mm sieve, maximum 5% passing 0.075 mm sieve to OPSS 1004.05.04, November 2012.
.4 Drainage material: 19 mm crushed stone or 19 to 63 mm clean gravel to OPSS 1004.05.07, November 2012.
.5 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/m ü 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.
.6 Geotextiles: to Section 31 32 19.01.
.7 Culvert: to CAN/CSA-G401, 2 mm, corrugated steel, round, galvanized with Z610 zinc coating designation to ASTM A653/A653M.
.8 Couplers: bolt and lug type, compatible with and of same material as culvert.

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 according to sediment and erosion control drawings, sediment and erosion control plan, specific to site.
.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, from surfaces to be excavated within limits indicated.

3.3 PREPARATION/ PROTECTION

.1 Protect existing features in accordance with Section 01 56 00 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.
.5 Protect buried services that are required to remain undisturbed.

3.4 STRIPPING OF TOPSOIL

.1 Begin any topsoil stripping of areas as directed by Departmental Representative after area has been cleared of brush, weeds and grasses and removed from site.
.2 Strip topsoil to depths as directed by Departmental Representative.
  .1 Do not mix topsoil with subsoil.
.3 Stockpile in locations as directed by Departmental Representative.
  .1 Stockpile height not to exceed 2 m and should be protected from erosion.
.4 Dispose of unused topsoil as directed by Departmental Representative.

3.5 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.

3.6 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29.
.2 Obtain permit from authority having jurisdiction for temporary diversion of water course.
.3 Construct temporary Works to depths, heights and locations as approved by Departmental Representative.

3.7 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.
.2 Provide for Departmental Representative's review details of proposed dewatering prevention methods.
.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 to approved runoff areas in a 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.

3.8 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 directed by Departmental Representative.

.3 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.

.4 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.

.5 Restrict vehicle operations directly adjacent to open trenches.

.6 Dispose of surplus and unsuitable excavated material in approved location on site.

.7 Do not obstruct flow of surface drainage or natural watercourses.

.8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.9 Notify Departmental Representative when bottom of excavation is reached.

.10 Obtain Departmental Representative approval of completed excavation.

.11 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.

.12 Correct unauthorized over-excavation as follows:

.1 Fill under bearing surfaces and footings with Type 4 fill compacted to not less than 100% of corrected Standard Proctor maximum dry density in accordance with Section 31 05 10.

.2 Fill under other areas with Type 4 fill compacted to not less than 95% of corrected Standard Proctor maximum dry density in accordance with Section 31 05 10.

.13 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.

.14 Install geotextiles in accordance with Section 31 32 19.01.

3.9 FILL TYPES AND COMPACTION

.1 Type 3 material Rip Rap will be used to line ditches and swales

.2 Types 2 and 4 material will be used to bed and backfill culverts

3.10 BEDDING AND SURROUND OF CULVERTS

.1 Place and compact granular material Type 4 for bedding and surround of culverts 33 42 13.

.2 Place bedding and surround material in unfrozen condition.

3.11 BACKFILLING

.1 Place and compact granular material Type 4 for backfilling and covering of culverts 33 42 13.

.2 Place backfill material in unfrozen condition

3.12 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 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This Section specifies requirements for roadway excavation and embankment construction for small projects.

1.2 MEASUREMENT AND PAYMENT

.1 Stripping under embankments if required: will be measured in cubic metres calculated from cross sections taken by Departmental Representative in areas of excavation. Any grubbing will be included in this rate.
- .1 Departmental Representative will take initial cross sections before and after clearing, grubbing and stripping is completed.
- .2 Payment based in a unit rate See Item 3.11 and 3.12 in the Unit Price Table.

.2 Common Excavation, if required: measure in cubic metres calculated from cross sections taken by Departmental Representative in areas of excavation.
- .1 Departmental Representative will take initial cross sections after clearing, grubbing and stripping completed if required and immediately prior to excavation of material or filling to be incorporated into work.
- .2 Payment based in a unit rate See Items 3.13 and 3.14 in the Unit Price Table.

.3 Rock Excavation, if required:
- .1 Calculate volume excavated from solid rock masses in cubic metres from cross sections of original rock surface and design grade line for excavation.
- .2 Departmental Representative will take initial cross sections after clearing, grubbing and stripping completed and immediately prior to excavation of material to be incorporated into work.
- .3 Measure rock excavated beyond design grade as Common Excavation when placed in embankment within established lines and grades.
- .4 Measure excavated boulders and rock fragments measured individually. Determine volume of excavated boulders and rock fragments by measuring three maximum mutually perpendicular dimensions.
- .5 Payment based on unit rate provided See Items 3.15 and 3.16 in the Unit Price Table.

.4 Supply of Granular Fill Materials Type 2 and 4 will be measured in cubic metres based on surveys taken by the Departmental Representative before and after the fill is placed in the fill zones indicated on the drawings and cross-sections and/or digital terrain models. See Items 3.2 and 3.4 in the Unit Price Table.

.5 Embankment Fill and Road Base Materials hauled from site stockpiles, placed in lifts, compacted and trimmed will be measured cubic metres

based on surveys taken by the Departmental Representative before and after the fill is placed in the fill zones indicated on the drawings and cross-sections and/or digital terrain models. See Items 3.17 to 3.20 in the Unit Price Table.

.6 No separate payment for:
- .1 Excavating unnecessarily beyond lines established by Departmental Representative, with exception of unavoidable slide material. Do not measure slide material, when such slides are attributable to negligence.
- .2 Ripping and/or drilling and blasting of material.
- .3 Scarifying or benching existing slopes or existing road surfaces.
- .4 Removing and disposing of roots, stumps and other materials excavated during waste operation.
- .5 Burying or reusing existing culverts from old road.
- .6 Removing unsuitable material from embankment attributable to negligence.
- .7 Shattering rock to 300 mm below subgrade elevation.
- .8 Scaling and removing loose rock from rock face.
- .9 Watering, drying and compacting.
- .10 Finishing.

1.3 REFERENCES

.1 Definitions:
- .1 Rock Excavation: excavation of:
  - .1 Material from solid masses of igneous, sedimentary or metamorphic rock which, prior to removal, was integral with parent mass. Material that cannot be ripped with reasonable effort with a Caterpillar D9 crawler bulldozer or equivalent to be considered integral with parent mass.
  - .2 Boulder or rock fragments measuring in volume 1 cubic metre or more.
- .2 Common Excavation: excavation of materials that are not Rock Excavation or Stripping.
- .3 Free Haul: distance that excavated material is hauled without compensation. Free haul distance to be 0.7 km or less.
- .4 Stripping: excavation of organic material covering original ground.
- .5 Over Haul: authorized hauling in excess of free haul distance that excavated material is moved.
- .6 Embankment: material derived from usable excavation and placed above original ground or stripped surface up to top of road and landfill surfaces.
- .7 Waste Material: material unsuitable for embankment, embankment foundation or material surplus to requirements.
- .8 Borrow Material: material obtained from areas outside right-of-way and required for construction of embankments or for other portions of work.
- .9 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.

.2 Reference Standards:
- .1 ASTM International (ASTM)

.1 ASTM D698-12e1, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/mü).

.2 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO T99-10, Standard Method of test for Moisture-Density Relations of Soils Using a 2.5 kg (5.5lb) Rammer and 305 mm (12 in) Drop.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Adhere to Territorial and National Environmental requirements at all times

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Embankment materials require approval by Departmental Representative.

.2 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.

.3 Material: Obtain from sources such as quarry, or borrow pit as approved by Departmental Representative.

.1 Embankment materials to consist of acceptable earth material and processed rock material free from objectionable quantities of organic matter, frozen soil, stumps, trees, moss, and other unsuitable materials.

.2 The gradation of Embankments and Road Surface Materials will be in accordance with Section 31 05 16.

.3 A portion of granular materials used to construct the access road ramp to the base of AEC-3 will be recovered and reused in Zone 2 of the Landfill Embankment.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that condition of substrate is acceptable for roadway and landfill embankment Work:

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed

from Departmental Representative.

3.2 COMPACTION EQUIPMENT

.1 Compaction equipment: vibratory rollers or vibrating plate compactors capable of obtaining required density in materials on project.
  .1 Demonstrate compaction equipment effectiveness on specified material and lift thickness by documented performance of test-strip before start of Work.
  .2 Replace or supplement equipment that does not achieve specified densities.
.2 Operate compaction equipment continuously in each embankment when placing material.

3.3 WATER DISTRIBUTORS

.1 Apply water with equipment capable of uniform distribution.

3.4 STRIPPING OF TOPSOIL

.1 Place top soil and finish grading as directed by Departmental Representative.
.2 Commence topsoil stripping of areas as directed by Departmental Representative after brush, weeds and grasses have been removed from these areas.
.3 Strip topsoil to depths as directed by Departmental Representative. Do not mix topsoil with subsoil.
.4 Stockpile in locations as directed by Departmental Representative.
  .1 Stockpile height: not to exceed 2 m.
.5 Dispose of unused topsoil as directed by Departmental Representative.
.6 Remove clearing and grubbing debris from stripping.
.7 Spread organic stripping, on completion of excavation and embankment construction, on slopes and trim or remove from site if quantity exceeds ability to grade on site.

3.5 EXCAVATING

.1 General:
  .1 Notify Departmental Representative when waste materials are encountered and remove to depth and extent directed.
  .2 Sub-excavate 500 mm below subgrade where waste is found unless otherwise directed by Departmental Representative.
    .1 Compact top 150 mm below sub-excavate to minimum 95% maximum dry density, to ASTM D698.
    .2 Replace with approved embankment material and compact to specified embankment density.
.2 Drainage:
  .1 Maintain profiles, crowns and cross slopes to provide good surface drainage.
  .2 Provide ditches as work progresses to provide drainage.
  .3 Construct interceptor ditches as indicated or as directed before excavating or placing embankment in adjacent area.

3.6 EMBANKMENTS

.1 Scarify or bench existing slopes in side hill or sloping sections to ensure proper bond between new materials and existing surfaces.
  .1 Method used to be pre-approved in writing by Departmental Representative.
.2 Break up or scarify existing road surface prior to placing embankment material.
.3 Do not place material which is frozen nor place material on frozen surfaces except in areas authorized by Departmental Representative.
.4 Maintain crowned surface during construction to ensure ready run-off of surface water.
.5 Drain low areas before placing materials.
.6 Place and compact Type 2 material to full width in layers not exceeding 400 mm loose thickness. Departmental Representative may authorize thicker lifts if specified compaction can be achieved. Preferentially place coarser material in the outer 1m of the fill zone in embankments.
.7 Place and compact Type 4 material to full width in layers not exceeding 150mm loose lift.
.8 Deductions from excavation will be made for overbuild of embankments.

3.7 COMPACTION

.1 Break material down to sizes suitable for compaction and mix for uniform moisture to full depth of layer.
.2 Deposit, spread, and level Type 2 embankment material in layers 400 mm maximum thickness before compaction.
  .1 Compact each layer of embankment until compaction equipment achieves no further significant consolidation.
  .2 Ensure required compaction for each layer before placing any material for next layer.
.3 Use specialized compaction equipment supplemented by routing, hauling, and leveling equipment over each layer of fill.
.4 Obtain written approval from Departmental Representative before using specialized compaction equipment such as tamping rollers, vibratory rollers, or other alternate compaction equipment that produces the required results
  .1 For tamping rollers, use equipment that exerts 1000 kPa minimum of pressure on tamping surface of each tamping foot in transverse row.
.5 Compact each layer to minimum 95% maximum dry density: ASTM D698 except top 250 mm of material (Type 4 granular fill).
  .1 Compact top 250 mm to 98% maximum dry density.
.6 Add water or dry as required to bring moisture content of materials to level required to achieve specified compaction.

3.8 FINISHING

.1 Shape entire roadbed to within 50 mm of design elevations.
.2 Finish slopes, true to lines, grades and drawings where applicable. Scale slope by removing loose fragments, for cut slopes in bedrock steeper than

1:1.

.3 Remove rocks over 100 mm in dimension from sloped surface and bottoms of ditches.

.4 Hand finish slopes that cannot be finished satisfactorily by machine.

.5 Run tractor tracks over slopes exceeding 3 m in height to leave tracks parallel to crest line of the embankment.

3.9 CLEANING

.1 Progress Cleaning:

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

.3 Waste Management: separate waste materials for burial.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.10 PROTECTION

.1 Maintain finished surfaces in condition conforming to this section until acceptance by Departmental Representative.

.2 Provide silt fences and erosion protection as required to mitigate and prevent impacts to adjacent properties.

END OF SECTION

Part 1 GENERAL

1.1 DESCRIPTION

.1 This section specifies the requirements for the installation of non-woven geotextiles to be installed at the AEC-3 Main Landfill site and along excavated swales/ditches as per contract documents.

1.2 MEASUREMENT AND PAYMENT

.1 The geotextile will be supplied by the owner.

.2 Placement of non-woven geotextile, as indicated, will be paid on a unit rate per square metre basis as measured from appropriate and agreed ground surveys and measurements. See Items 3.21 to 3.23 for placement in the Unit Price Table.

.1 The unit rate for placement of the geotextile will be per square metre measured by the aerial coverage and will need to account for the required overlaps.

.2 The anchor trench will be included in the measurement.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit to Departmental Representative in accordance with Section 01 33 00

.2 Submittals

.1 Submit Methods of Joining 4 weeks prior to beginning the Work.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Store and handle materials in accordance with Section 01 61 00 and with manufacturer's written instructions.

.2 Handling Requirements:

.1 Store materials off ground in a clean dry location and in accordance with manufacturer's recommendations.

.2 Store and protect geotextiles from direct sunlight and UV rays.

.3 Replace defective or damaged materials with new.

Part 2 PRODUCTS

2.1 MATERIALS

.1 Non-Woven Geotextile will be supplied by the owner.

.1 The geotextile is to be a non-woven fabric consisting only of continuous chain polymeric filaments or yarns of polyester, formed into a stable network by needle punching.

.2 The fabric is to be inert to commonly encountered chemicals, hydrocarbons, mildew and rot resistant, resistant to ultraviolet light exposure, insect and rodent resistant.

.3 The minimum average roll value (weakest principal direction) for strength properties of any individual roll tested from the manufacturing lot or lots of a particular shipment is to be in excess of the minimum average roll value, weakest principal direction, stipulated below.

.2 Securing pins and washers: to CSA G40.20/G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m^2, Coating Grade 85 to ASTM A123/A123M

Part 3 EXECUTION

3.1 QUALITY ASSURANCE

.1 All materials, procedures, operations, and methods are to be in strict conformance with the Drawings and Specifications and are to be subjected to strict quality assurance monitoring as detailed herein. The installed systems are to conform to the Drawings and Specifications, except as otherwise authorized in writing by Departmental Representative.

3.2 UNDERLYING SURFACE PREPARATION

.1 Ensure that the surface underlying the geotextile is clean and is free from angular rocks, debris and protrusions.

3.3 DEPLOYMENT

.1 Do not begin installation of geotextile until the base has been approved by Departmental Representative.

.2 Deploy the geotextile by unrolling onto the prepared surface in orientation, manner and locations indicated.

.3 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.4 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile, perpendicular to the slope direction.

.5 Overlap adjacent geotextile panels in accordance with manufacturer's recommendations (minimum 300 mm).

.6 Employ sufficient temporary anchorage to hold geotextile in place during backfilling.

.7 Protect installed geotextile material from displacement and damage until, during and after placement of additional material layers.

.8 Repair rips or tears with a patch to cover a minimum of 1 metre on each side of the rip or tear.

3.4 ANCHORAGE

.1 Anchor the geotextile in accordance with the supplier’s standard procedures and details. Temporary anchorage can be provided by sandbags. Compact backfill in such a manner as to not damage the geotextile.

3.5 PROTECTION

.1 Do not permit passage of any vehicle directly on geotextile at any time.

END OF SECTION

Part 1 GENERAL

1.1 DESCRIPTION

.1 This section describes the requirements for the placement of Rip Rap – Type 3 granular material on geotextile which will overlie other granular fill materials in the Landfill Embankment or overlie parent soil in excavated swales or ditches.

1.2 RELATED SECTIONS

.1 Section 31 05 16 – Aggregate Materials

.2 Section 31 32 19.01 - Geotextiles

1.3 MEASUREMENT AND PAYMENT PROCEDURES

.1 Measure rip-rap in cubic metres of material placed.

.2 Payment for supply will be based on unit rate per cubic metre placed. See Item 3.3 in the Unit Price Table.

.3 Payment for placement of Rip Rap in ditches and swales will be made on a unit rate for cubic metres placed. See Item 3.24 and 3.25 in the Unit Price Table. Appropriate survey techniques will be agreed with the Departmental Representative to determine the volume of rip rap placed.

.4 Payment for placement of Rip Rap on the Landfill Embankment outer surface will be made on a unit rate for cubic metres placed. See Item 3.26 in the Unit Price Table. Appropriate survey techniques will be agreed with the Departmental Representative to determine the volume of rip rap placed.

1.4 REFERENCES

.1 OPSS 1004 - November 2013

Part 2 PRODUCTS

2.1 STONE

.1 Stone Hard, with relative density (formally specific gravity) not less than 2.65, durable quarry stone, free from seams, cracks or other structural defects, to meet the size distribution specified in Section 31 05 16

2.2 GEOTEXTILE FILTER

.1 Geotextile: in accordance with Section 31 32 19.01

Part 3 EXECUTION

3.1 PLACING

.1 Where rip-rap is to be placed on slopes, excavate trench at toe of slope to dimensions as indicated.

.2 Fine grade area to be rip-rapped to uniform, even surface. Fill depressions with suitable material and compact to provide firm bed.

.3 Place geotextile on prepared surface in accordance with Section 31 32 19.01 and as indicated. Avoid puncturing geotextile. Vehicular traffic over geotextile not permitted.

.4 Place rip-rap to thickness and details as indicated.

.5 Place stones in manner approved by Departmental Representative to secure surface and create a stable mass. Place larger stones at bottom of slopes.

.6 Hand placing may be required in certain ditches and swales:

.1 Use larger stones for lower courses and as headers for subsequent courses.

.2 Stagger vertical joints and fill voids with rock spalls or cobbles.

.3 Finish surface evenly, free of large openings and neat in appearance.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

.1 This section specifies the supply and installation of corrugated steel pipe culverts.

1.2 MEASUREMENT AND PAYMENT

.1 Measure supply and installation of pipe culvert including excavation and backfill in metres in place for each size, type and class of pipe. Payment will be made on the basis of unit rate per metres of culvert diameter supplied and installed. See Item 3.27 in Unit Price Table.

.2 Cost of supply and installation will include any necessary dewatering prior to placing of bedding and construction maintenance and removal of any temporary bypass roads.

1.3 REFERENCES

.1 ASTM International

.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 D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ftü (600 kN-m/mü)).

.2 CSA International

.1 CAN/CSA-G401-07, Corrugated Steel Pipe Products.

.3

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for [pipes and backfill] and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Inform Departmental Representative at least 4 weeks before beginning Work, of proposed source of bedding materials and provide access for sampling.

.4 Certification: to be marked on pipe.

.5 Test and Evaluation Reports:

.1 Submit manufacturer's test data and certification at least 4 weeks

prior to beginning Work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
.3 Storage and Handling Requirements:
  .1 Store materials in accordance with manufacturer's recommendations.
  .2 Store and protect pipes from damage.
  .3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 CORRUGATED STEEL PIPE

.1 Corrugated steel pipe: to CAN/CSA-G401 600 mm diameter.
.2 Water-tight cut-off collars: as indicated.
.3 Prefabricated wing walls: as indicated.

2.4 GRANULAR BEDDING [AND BACKFILL]

.1 Granular bedding and backfill material Type 4 granular fill and following requirements:
  .1 Crushed pit run or screened stone, gravel or sand.
  .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for pipe culvert installation in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Departmental Representative.
  .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Departmental Representative].

3.2 PREPARATION

.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, specific to site.

.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.

3.3 TRENCHING

.1 Do trenching Work in accordance with Section 31 23 33.01.

.2 Obtain Departmental Representative's approval of trench line and depth prior to placing bedding material or pipe.

3.4 BEDDING

.1 Dewater excavation, as necessary, to allow placement of culvert bedding in dry condition.

.2 Place 200 mm minimum thickness of approved granular material on bottom of excavation and compact to 95% minimum corrected maximum dry density to ASTM D698.

.3 Shape bedding to fit lower segment of pipe exterior so that width of at least [50%] of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Departmental Representative, free from sags or high points.

.4 Place bedding in unfrozen condition.

3.5 LAYING CORRUGATED STEEL PIPE CULVERTS

.1 Begin pipe placing at downstream end.

.2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.

.3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.

.4 Do not allow water to flow through pipes during construction except as permitted by Departmental Representative.

3.6 JOINTS: CORRUGATED STEEL CULVERTS

.1 Corrugated steel pipe:

.1 Match corrugations or indentations of coupler with pipe sections before tightening.

.2 Tap couplers firmly as they are being tightened, to take up slack and ensure snug fit.

.3 Insert and tighten bolts.

.4 Repair spots where damage has occurred to spelter coating by applying

3.7 BACKFILLING

.1 Backfill around and over culverts as indicated or as directed by Departmental Representative.

.2 Place granular backfill material, approved in writing by Departmental Representative, in 150 mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically.

.3 Compact each layer to 95% corrected maximum dry density to ASTM D698 taking special care to obtain required density under haunches.

.4 Protect installed culvert with minimum 600 mm cover of compacted fill before heavy equipment is permitted to cross.

.5 During construction, width of fill, at its top, to be at least twice diameter or span of pipe and with slopes not steeper than 1:2.

.6 Place backfill in unfrozen condition.

3.8 CLEANING

.1 Progress Cleaning:

.1 Leave Work Area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.

END OF SECTION