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Saved by: Hassler, Brad

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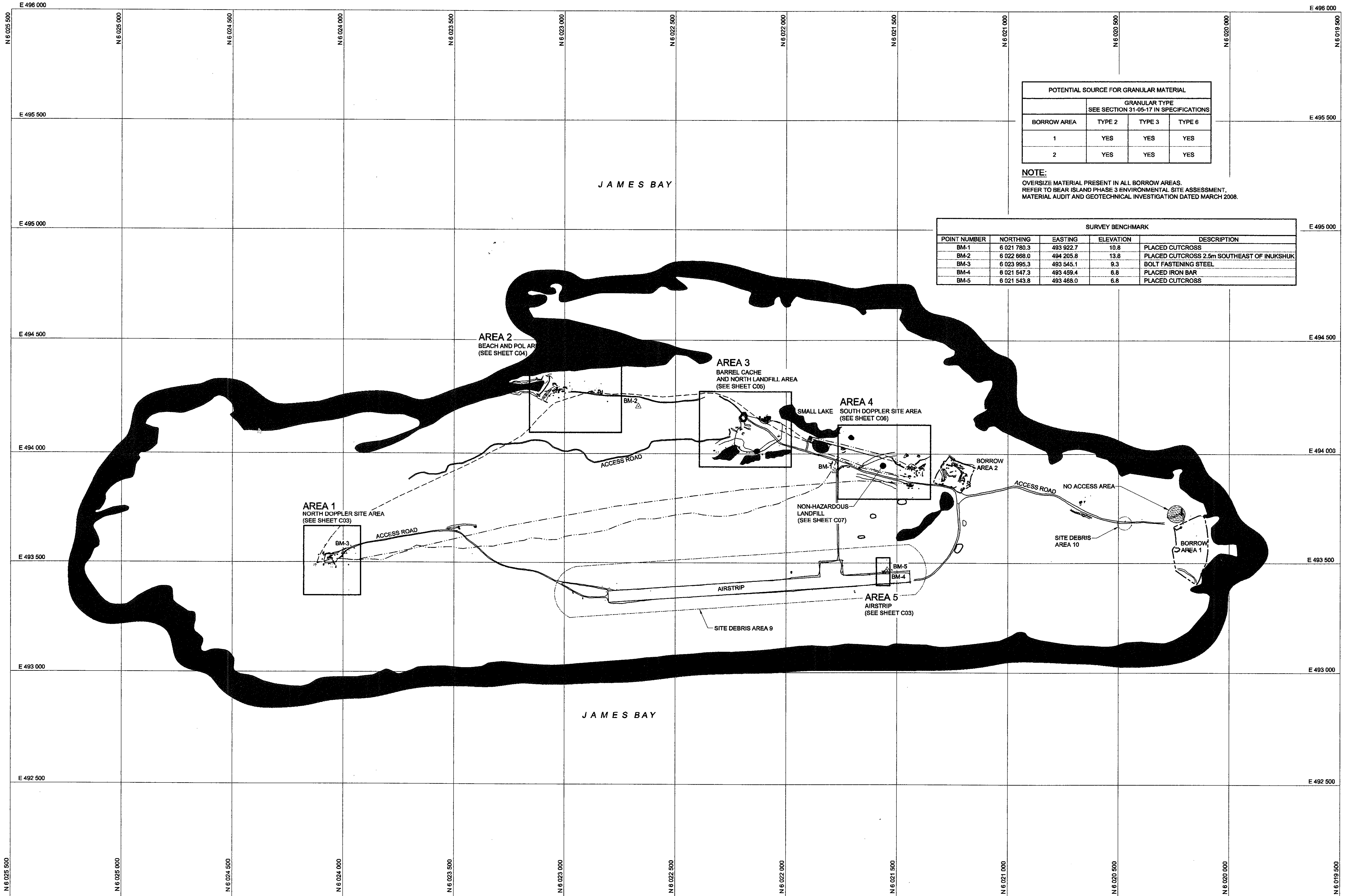


POTENTIAL SOURCE FOR GRANULAR MATERIAL			
	GRANULAR TYPE SEE SECTION 31-05-17 IN SPECIFICATIONS		
BORROW AREA	TYPE 2	TYPE 3	TYPE 6
1	YES	YES	YES
2	YES	YES	YES

NOTE:

OVERSIZE MATERIAL PRESENT IN ALL BORROW AREAS.
REFER TO BEAR ISLAND PHASE 3 ENVIRONMENTAL SITE ASSESSMENT, MATERIAL AUDIT AND GEOTECHNICAL INVESTIGATION DATED MARCH 2008.

SURVEY BENCHMARK				
POINT NUMBER	NORTHING	EASTING	ELEVATION	DESCRIPTION
BM-1	6 021 780.3	493 922.7	10.8	PLACED CUTCROSS
BM-2	6 022 668.0	494 205.8	13.8	PLACED CUTCROSS 2.5m SOUTHEAST OF INUKSHUK
BM-3	6 023 995.3	493 545.1	9.3	BOLT FASTENING STEEL
BM-4	6 021 547.3	493 459.4	6.8	PLACED IRON BAR
BM-5	6 021 543.8	493 468.0	6.8	PLACED CUTCROSS

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region

Client

Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Canadä

NUNAVUT REGIONAL OFFICE
IQALUIT, NUNAVUT

Client

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. SITE PLANS AND TOPOGRAPHIC INFORMATION ARE BASED ON AIR PHOTOS AND SURVEY PROVIDED BY EARTH TECH AND INAC. CURRENT CONDITIONS MAY NOT BE EXACTLY AS SHOWN.
3. ALL COORDINATES ARE SITE COORDINATES AND ALL ELEVATIONS ARE BASED ON SITE DATUM.
4. ACCESS ROADS REQUIRE REPAIRS OR UPGRADE PRIOR TO USE.
5. REFER TO TABLE 024123-1 IN APPENDIX B OF SPECIFICATIONS FOR DESCRIPTION OF DEBRIS AREA.
6. ALL NON-HAZARDOUS DEBRIS TO BE PLACED IN NON-HAZARDOUS WASTE LANDFILL.

LEGEND:

- BODY OF WATER
- APPROXIMATE EXTENT OF BORROW AREAS
- SURVEY BENCHMARK
- NO ACCESS AREA
- POL LINES
- ELECTRICAL CABLE
- SITE DEBRIS AREAS

B. FEDORAK
PERMIT TO PRACTICE
PERMIT NUMBER: P639
NWT/NU Association of Professional Engineers and Geoscientists

AECOM

REVISIONS	DESCRIPTION	DATE
0	ISSUED FOR CONSTRUCTION	10/06/08

A detail number / number du detail
B source drawing no. / de dessin no.
C detail on drawing no. / detail sur dessin no.

project title / titre du projet

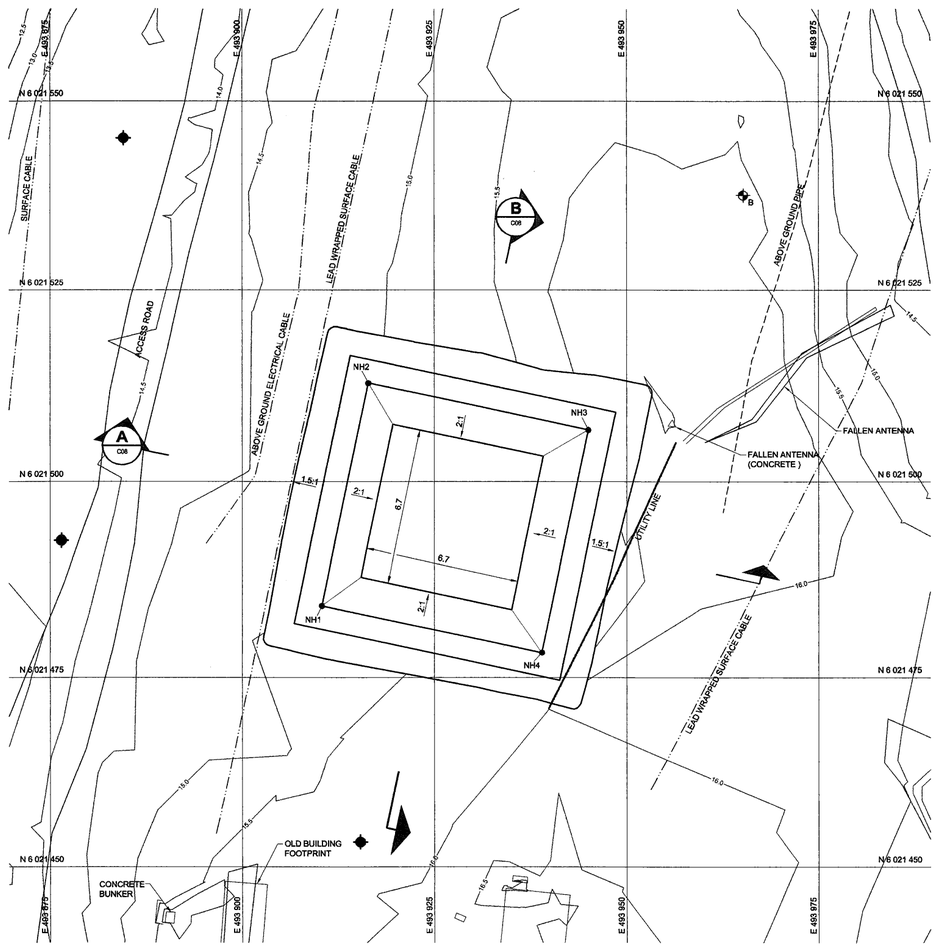
BEAR ISLAND REMEDIATION PROJECT

drawing title / titre du dessin

OVERALL SITE PLAN

designed by / concu par: T. ESHPETER
drawn by / dessine par: B. CHAO
approved by / approuve par: B. FEDORAK
PWGSC Project Manager / Administrateur de Projets TPSGC: M. McELWAINE
scale / echelle: 1:7500
project no. / projet no.: 421391
date / date: JUNE, 2010
sheet / feuille: C02 OF 09

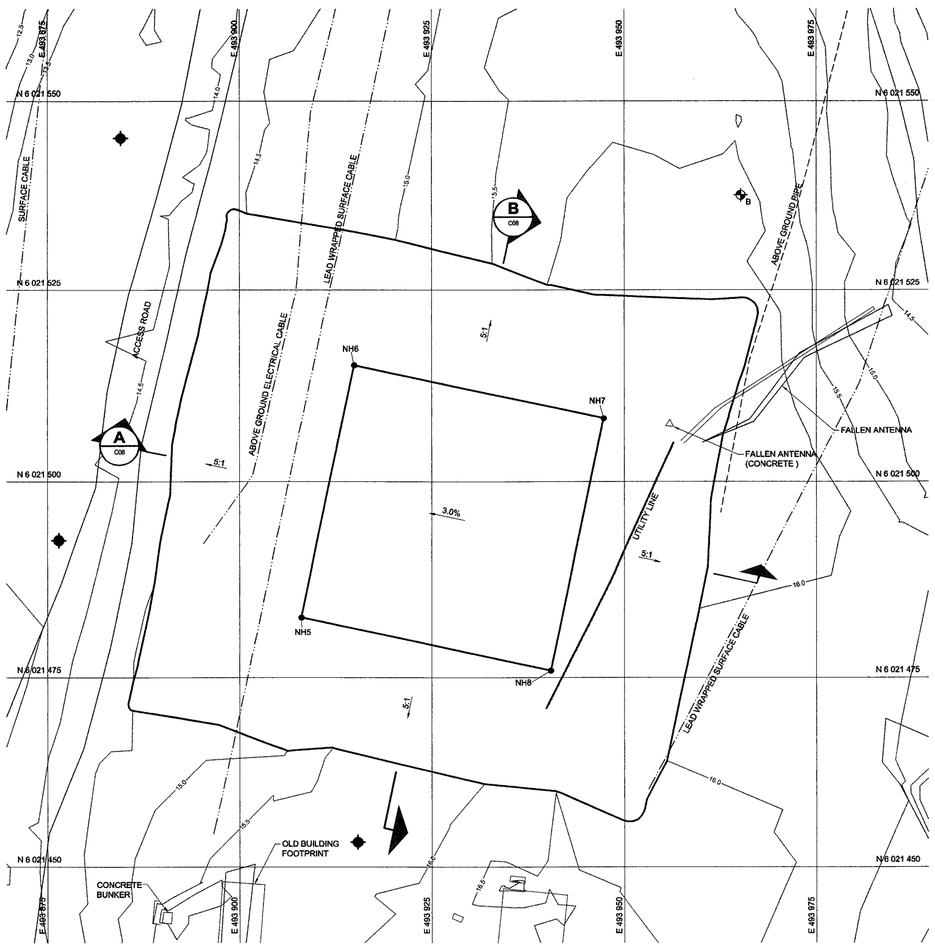
421391-C02



BERM PLAN

0 3 6 9 m SCALE 1:300

COORDINATE POINTS NON-HAZARDOUS WASTE LANDFILL BERM			
No.	NORTHING	EASTING	ELEVATION
NH1	6 021 484.28	493 910.33	17.28
NH2	6 021 512.84	493 916.39	17.28
NH3	6 021 506.77	493 945.01	18.15
NH4	6 021 478.21	493 938.95	18.15



FINAL COVER PLAN

0 3 6 9 m SCALE 1:300

COORDINATE POINTS NON-HAZARDOUS WASTE LANDFILL SURFACE			
No.	NORTHING	EASTING	ELEVATION
NH5	6 021 482.78	493 908.02	18.42
NH6	6 021 515.16	493 914.89	18.42
NH7	6 021 508.27	493 947.33	19.44
NH8	6 021 475.89	493 940.45	19.44

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REAL PROPERTY SERVICES
Western Region

Client: Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Canada

NUNAVUT REGIONAL OFFICE
IQALUIT, NUNAVUT

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3. CONTOURS SHOWN REPRESENT EXISTING GROUND AT INTERVAL OF 0.5m.
4. ALL COORDINATES ARE SITE COORDINATES AND ALL ELEVATIONS ARE BASED ON SITE DATUM.
5. FOR MONITORING WELL INSTALLATION DETAILS SEE SHEET C09. ALL LOCATIONS TO BE FIELD APPROVED BY THE DEPARTMENTAL REPRESENTATIVE.

LEGEND:

- NH1 — COORDINATE POINT
- EBA-TP11 — TEST PIT LOCATION
- POL LINES
- ELECTRICAL CABLE
- PROPOSED MONITORING WELL LOCATION
- B — PROPOSED BACKGROUND MONITORING WELL LOCATION

B.J. FEDORAK — PROFESSIONAL ENGINEER — NWT/NU — 2010-06-08

PERMIT TO PRACTICE
Signature: [signature]
Date: 2010-06-08
PERMIT NUMBER: P639
NWT/NU Association of Professional Engineers and Geoscientists

AECOM

REVISIONS	DESCRIPTION	DATE
0	ISSUED FOR CONSTRUCTION	10/06/08

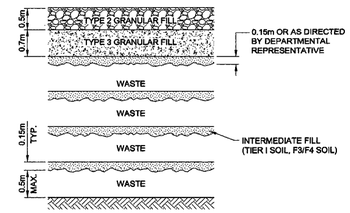
A detail number / number du detail
B source drawing no. / de dessin no.
C detail on drawing no. / detail sur dessin no.

project title / titre du projet
BEAR ISLAND REMEDIATION PROJECT

drawing title / titre du dessin
NON-HAZARDOUS WASTE LANDFILL PLAN

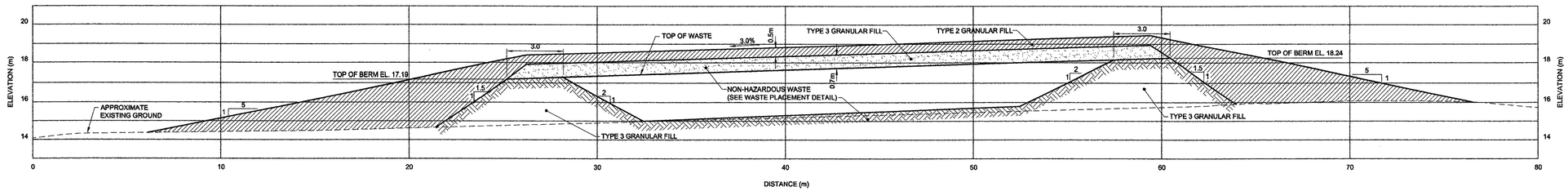
designed by / conçu par	T. EISHPETER
drawn by / dessiné par	B. CHAO
approved by / approuvé par	B. FEDORAK
PWGSC Project Manager / Administrateur de Projets TPSGC	M. McELWAINE
scale / échelle	1:300
project no. / projet no.	421391
date	JUNE, 2010
sheet / feuille	C07 OF 09

ADD ADDITIONAL WASTE LAYERS, AS REQUIRED, TO ACHIEVE THE NON-HAZARDOUS WASTE LANDFILL DESIGN ELEVATIONS.



WASTE PLACEMENT DETAIL

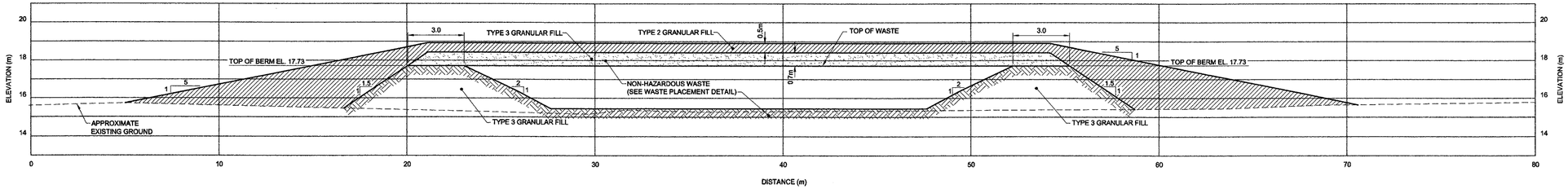
SCALE: N.T.S.



SECTION A

C07

SCALE 1:100



SECTION B

C07

SCALE 1:100

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

REAL PROPERTY SERVICES
Western Region

Client: Indian and Northern Affairs Canada / Affaires indiennes et du Nord Canada

Canada

NUNAVUT REGIONAL OFFICE
IQALUIT, NUNAVUT

GENERAL NOTES:

1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL COORDINATES ARE SITE COORDINATES AND ALL ELEVATIONS ARE BASED ON SITE DATUM.

B. FEDORAK — LICENSED — NWT/NU — 2010-04-08

PERMIT TO PRACTICE
Signature
Date 2010-06-08
PERMIT NUMBER: P659
NWT/NU Association of Professional Engineers and Geoscientists

AECOM

REVISIONS	DESCRIPTION	DATE
0	ISSUES FOR CONSTRUCTION	10/06/08

A detail number / number du detail
B source drawing no. / de dessin no.
C detail on drawing no. / detail sur dessin no.

project title / titre du projet
BEAR ISLAND REMEDIATION PROJECT

drawing title / titre du dessin
NON-HAZARDOUS WASTE LANDFILL SECTIONS

designed by / conçu par	D. GILBERTSON
drawn by / dessiné par	B.CHAO
approved by / approuvé par	B. FEDORAK
PWGSC Project Manager / Administrateur de Projets TPSGC	M. McELWAINE
scale / echelle	AS SHOWN
project no. / projet no.	421391
date / date	JUNE, 2010
sheet / feuille	C08
	OF 09

421391-C08

PART 1 GENERAL

1.1 Definitions

.1 PCB-Amended Painted (PAP) Material: Material that is coated with PCB-amended paint, and has been analyzed and the materials, including the paint, determined to contain PCB concentrations in excess of 50 ppm.

.2 Contractor's Designated Hazardous Waste Disposal Facilities: The Licensed Hazardous Waste Disposal Facilities, designated by Contractor and pre-approved by Departmental Representative, for the disposal of all hazardous waste specified under the provisions of this contract. Contractor must be able to provide documentation from the Designated Hazardous Waste Disposal Facilities indicating full responsibility for all hazardous waste accepted from Bear Island.

.3 Untreated Wooden Debris: Wooden debris that is not painted or treated in any way and is suitable for on-site incineration.

.4 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).

1.2 Reference Standards

.1 National Building Code of Canada, 2005.

.2 CSA-S350-M1980, Code of Practice of Safety in Demolition of Structures.

.3 SOR/92-507, Storage of PCB Material Regulations.

.4 Occupational Safety and Health Guidance Manual for Hazardous Waste Site Activities: NIOSH Publication No. 85-115

.5 Hazardous Waste Worker Training Manual: Canadian LIUNA Contractors Training Council, 1992

.6 Conduct all work in accordance with all appropriate Federal and Territorial legislation, and international conventions including:

.1 Transportation of Dangerous Goods
.2 Guidelines for the packing of cargo, other than bulk cargo into or onto cargo transport units (CTU's) applicable to transport operations by all surface and water modes of transport.

1.3 Work Description

.1 Demolition, removal, and disposal of all structures, utilities, and related ancillary facilities as indicated on the Structural Drawings and/or as indicated in the Demolition Tables in Appendix A including the following:

.1 Supply and transport to the site of containers, bracing, dunnage, and polyethylene sheets required for the containerization of PCB-amended Painted (PAP) materials.

.2 Demolition and disposal into the on-site Non-Hazardous Waste Landfill of all non-hazardous waste building components, building contents, storage tanks and utility lines, excluding Untreated Wooden Debris, identified for demolition.

.3 On-site incineration of all Untreated Wooden Debris

.4 Removal, segregation and containerization of all hazardous building facility components, including items coated with PCB-amended paint (PAP) that contain PCB concentration levels in excess of 50 ppm.

.5 Removal and disposal of asbestos material in accordance with Specification Sections 02 82 00.01.

.6 Removal and Containerization of hazardous waste material in accordance with Section 02 61 33 - Hazardous Waste Material.

.7 Application of appropriate labelling and placards for the containers. Labels illustrated in Figures 02 41 16 -1 and 02 41 16 -2 at the end of this Section will be supplied by Departmental Representative.

.8 Establishment of a Temporary Storage Area for waste to be shipped off-site, and on-site transportation of containerized hazardous materials to this area.

.9 Off-site transport of all hazardous building components and contents, including PCB-Amended Painted (PAP) Material, to the Contractor's Designated Hazardous Waste Disposal Facilities.

.10 Restoration and grading of all areas affected by demolition work in accordance with Section 31 22 15 - Grading.

.11 Preparation of an inventory list of hazardous containers and their contents.

.12 Provision of a photographic record of the internal contents of all completed hazardous containers prior to closure.

1.4 Existing Conditions

.1 The information presented on the Drawings and in the Specifications that describe the structures and utilities to be demolished is based upon site conditions described in the *Remedial Action Plan, Bear Island Mid-Canada Line Radar Station*, Earth Tech, March 2008.

.2 Take over structures and utilities to be demolished based on their condition on the date that Contractor mobilizes to the site.

.3 The information presented in the Appendices, including photographs and inventory tables, provide brief descriptions for structures and facilities to be demolished. These tables and drawings indicate only the major construction details and building systems, and are not to be construed as exact for final demolition requirements. Be responsible for all work described in this Section, which includes the complete demolition, removal and disposal or containerization of all facilities and structures designated for demolition.

.4 The information presented in the Appendices indicates types and quantities of hazardous waste materials that have been previously identified, and must be removed and disposed of in accordance with these Specifications. Should other potentially hazardous waste material, other than that already identified, be encountered in the course of demolition work, stop work immediately, and notify Departmental Representative. Do not proceed until written instructions have been received from Departmental Representative.

.5 Contractor is advised that site buildings to be demolished have been in a cold-soaked condition, and as a result, paint flaking/chipping and mould may be extensive. Paint flakes/chips are to be removed as described in this Section.

.6 A listing of the components of each facility that are to be containerized is presented in Appendix A. Not all painted surfaces of facilities and structures to be demolished have been sampled and tested for PCBs. If painted materials are identified that are not included in the tables in the Appendix, assume that these materials are to be containerized unless otherwise directed by Departmental Representative.

1.5 Qualifications

.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 hazardous waste management and who can satisfy Federal and Territorial requirements will be permitted to carry out the work of this Section. Contractor's Superintendent responsible for the work of this Section is to have appropriate level of experience in the area of hazardous waste management.

.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 are to be directly supervised by Contractor's personnel who have successfully completed a 40 hour training course for Hazardous Waste Activities in compliance with OSHA 29 CFR 1910.120 or other approved equivalent training courses such as the Canadian Hazardous Waste Workers Program.

.5 Contractor's personnel trained as described above 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 with protection appropriate to the potential type and level of 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.

1.6 Demolition Drawings

.1 Where required by authorities having jurisdiction, submit for approval drawings, diagrams or details showing sequence of disassembly work.

.2 Do not commence demolition work, including asbestos abatement and paint removal, until Contractor has demonstrated to Departmental Representative that all required permits to be acquired by Contractor for the work have been obtained.

1.7 Protection

.1 Prevent movement, settlement or damage of adjacent structures, services, roadways, and parking areas to remain. Provide bracing and shoring required. Make good damage and be liable for injury caused by demolition.

.2 Take precautions to support structures and, if safety of building being demolished or adjacent structures or services appear to be endangered, cease operations and notify Departmental Representative.

.3 All personnel engaged in demolition activities to wear and use protective clothing and equipment. Protect the environment from fugitive waste materials resulting from demolition activities.

.4 Prevent damage and minimize stripping of natural terrain, features and vegetation. Make good all damage.

.5 Provide safe passage of persons around area of demolition.

.6 Do not proceed with demolition work when weather conditions constitute a hazard to the workers and site. Prevailing weather conditions and weather forecast are to be considered.

.7 Cover and wet down dry materials, ash and rubbish to prevent blowing dust and debris. Provide dust control for existing and temporary roads.

1.8 Fires

.1 Comply with all regulatory requirements and obtain Burn Permit, if required.

.2 Burning of any painted materials is strictly prohibited.

.3 Where fires or burning are permitted, prevent staining or smoke damage to structures, materials or vegetation which are to be preserved. Restore, clean and return to new condition stained or damaged work.

.4 Provide supervision, attendance and fire protection measures in accordance with Section 01 35 32 - Site Specific Health and Safety Plan.

1.9 Measurement for Payment

.1 Include all direct costs for the following work items in the lump sum prices for Demolition, Items 02 41 16-1 to 02 41 16-8 for each facility to be demolished as indicated in the Basis of Payment Schedule:

.1 Removal, segregation, packaging and disposal of asbestos materials.
.2 Demolition, removal, segregation and disposal of non-hazardous demolition debris.
.3 Demolition, removal, segregation and placement of PCB-Amended Painted (PAP) materials into intermediate containers and subsequent consolidation of intermediate containers and larger demolition materials into barge containers, including the installation of bracing, locks, dunnage and drip trays within the containers, as required. Supply and placement of locks and application of appropriate labelling and placards on the containers.

.4 Incineration of Untreated Wooden Debris.
.5 The placement in layers and compaction of double bagged asbestos and non-hazardous demolition debris, into the on-site Non-Hazardous Waste landfill.
.6 Demolition, removal, segregation and containerization, of Leachable Lead Painted Materials, including provisions for containment of paint chips.
.7 Removal and containerization of fluorescent lamp ballasts.
.8 The demolition, removal and containerization, as required, including supply of containers, of sewage and sewage sludge from sewage tanks and sewage lines to be demolished, including line supports, marker posts and barrels.
.9 Supply and placement of on-site borrow material, as required by Departmental Representative, to backfill areas excavated to facilitate demolition requirements.
.10 General site grading of areas disturbed by demolition operations, including culvert removal.
.11 On-site transportation of hazardous waste materials to the on-site Temporary Storage Area.
.11 The above work items will not be measured for payment.
.12 The lump sum price Items 02 41 16-1 to 02 41 16-8 are itemized as follows:

.1 Item 02 41 16-1, Demolition: Electrical Hut at Beach Area including contents
.2 Item 02 41 16-2, Demolition: Shed at Airstrip Area
.3 Item 02 41 16-3, Demolition: Doppler Building Foundations at north and south locations
.4 Item 02 41 16-4, Demolition: Garage Concrete Pillars
.5 Item 02 41 16-5, Demolition: Fallen Antennae, north and south locations
.6 Item 02 41 16-6, Demolition: Boat at Beach Area
.7 Item 02 41 16-7, Demolition: POL Lines and Electrical Cables
.8 Item 02 41 16-8, Demolition: Concrete Antenna Foundations

.2 All indirect costs associated with the work described in this Section including supervision, overhead, profit, etc. are to be included in Item BOPC-1, Balance of Project Costs.

.3 The off-site transport and disposal of all containerized hazardous waste to Contractor's Designated Hazardous Waste Disposal Facilities is to be provided as indicated in Section 02 61 33 - Hazardous Waste Material.

.4 Handling and containerization of transformers will not be considered for payment under Section 02 41 16 - Structure Demolition, but will be negotiated with Departmental Representative using the Labour and Materials rates provided in the Potential Additional Work section of the Basis of Payment Schedule.

.5 Except as indicated above, work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this work as a separate line item in the cost breakdown specified in Section 01 32 18 - Construction Progress Schedules - Bar (GANTT) Chart.

PART 2 PRODUCTS

2.1 Materials

.1 Hazardous Waste Material Containers: In accordance with all requirements of the TDG Acts and Regulations. Submit details of the Hazardous Waste Material Containers to Departmental Representative for review prior to commencement of the work in accordance with Section 01 61 00 - Common Product Requirements.

.2 A listing of the components of each facility that are to be containerized is presented in Appendix A. Not all painted surfaces of facilities and structures to be demolished have been sampled and tested for PCBs. If painted materials are identified that are not included in the tables in the Appendix, assume that these materials are to be containerized unless otherwise directed by Departmental Representative.

.3 Polyethylene sheeting:

.1 6 mil (0.15 millimetres) minimum thickness for containing PAP material paint particles.

.4 Intermediate Containers for the storage of PAP materials (>50 ppm PCBs) and Containers for the storage of Metals/PCB Contaminated Soils:

.1 New wooden TDG-approved Containers, with dimensions of 1.2 metres (4 feet) by 1.2 metres (4 feet) by 1.83 metres (6 feet).
.2 Provide approval from Transport Canada for the use of containers for the transportation of PCB-Amended Painted Materials.

.5 ISO Barge Containers for the Storage of PAP materials (>50 ppm PCBs) and the consolidation of Intermediate Containers.

.1 Containers are to be of steel plate construction, with sufficient support to withstand the vertical and lateral pressures exerted by the materials placed in them. The containers are to be leakproof, of sufficient durability to prevent the PCB materials from being affected by the weather and suitable for transport by sea barge, ship, semi-trainer roadway vehicles, and rail, and for international shipment requirements.
.2 Containers are to be in new condition, with dimensions of 8 feet by 8 feet by 20 feet (2.44 metres by 2.44 metres x 6.10 metres).
.3 Containers is to include sufficient lashing fittings, attached to the frame members or panels, in order to secure cargo.
.4 Containers are to have drip trays composed of metal or polyethylene with plywood protection as described previously in this section.
.5 Prior to shipment to site, provide documentation indicating the steel barge containers were inspected and certified by Transport Canada.
.6 Containers are to be designed to support full gross weight for bottom lift by forklift or equivalent.
.7 Containers are to be end-loading type. Seal opening to prevent the escape of paint chips, flakes, and/or dust upon opening of the container.
.8 Submit details of the containers to Departmental Representative for review, including all required approvals, as well as a description of the type, volume and number of containers, prior to commencement of the work.
.9 The barge containers are to maintain a current Transport Canada inspection certification.

.10 Securely affix to the entrance of the barge container, a black and white weatherproof label measuring 150 millimetres by 150 millimetres in the form illustrated in Figure 1 (specific to the type of material containerized) at the end of this specification section and translated into the local dialect.

.11 Securely affix to a visible side of the barge container, a black and white weatherproof label measuring 76 millimetres by 76 millimetres bearing the unique Environment Canada Registration number. Do not obstruct the view of the barge container number or Environment Canada Registration number. Environment Canada PCB labels to be provided by Departmental Representative. The label is to be in the form illustrated in Figure 2 (specific to the type of material containerized) at the end of this specification section.

.12 These containers remain the property of Contractor.

.6 Provide drip tray material for all on-site ISO barge containers consisting of 60 mil high-density polyethylene (HDPE) or 6 mil (0.15 millimetres) polyethylene with minimum 12.5 millimetres thick plywood for protection.

.7 Provide dunnage, locks, and bracing material for securing PAP material placed in steel containers.

PART 3 EXECUTION

3.1 Work

.1 Before commencing demolition, remove all hazardous materials and asbestos-containing products. Hazardous material and asbestos removal work must be completed and accepted in writing by Departmental Representative prior to the start of general demolition.

.2 Before commencing demolition of fuel storage tanks, remove and dispose of remaining contents and tank sludge, and clean tanks, in accordance with Section 02 61 33 - Hazardous Waste Material.

.3 Pump out existing water tanks and sewage tanks prior to demolition. Clean water tanks, sewage tanks and lines in accordance with Section 02 61 33 - Hazardous Waste Material.

.4 Remove and dispose of demolition debris as specified in this Section and in Section 31 22 15 - Grading.

3.2 Environmental Protection

.1 Perform work in an environmentally acceptable manner. Comply with requirements of Section 01 35 43 - Environmental Procedures, and all other applicable standards and licenses.

3.3 Safety and Personnel Protection

.1 Unless otherwise specified, carry out demolition work in accordance with Section 01 11 00 - Summary of Work and Section 01 35 32 - Site Specific Health and Plan.

.2 Some areas designated for demolition under this contract involve materials which contain PCBs and leachable lead-based paints, as well as other contaminants which are considered hazardous to human health. PCBs at concentrations in excess of 50 ppm are considered to be hazardous substances. Storage, handling, and disposal of PCBs are regulated under the Canadian Environmental Protection Act and the Federal Transportation of Dangerous Goods Act. Comply with all applicable regulations.

.3 During the removal of PCB-amended painted materials, follow the Personnel Protection Requirements specified for the removal of asbestos materials as indicated in Section 02 82 00.02 - Asbestos Abatement Intermediate Precautions.

.4 When working with PCB-containing materials, leachable lead-based paints, asbestos, 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, subcontractors, Departmental Representative, Departmental Representative's staff, and other authorized personnel.

.5 Fluorescent lamp ballasts are to be handled, and general safety precautions followed, as stated below:

.1 Some ballasts in the buildings to be demolished may contain PCB-filled capacitors.
.2 Appropriate health and safety precautions should be taken as per Contractor’s SSHSP while handling ballasts.
.3 Refer to Environment Canada Publication, “Identification of Fluorescent Lamp Ballasts Containing PCBs”.

.6 Transformers are to be handled, and general safety precautions followed, as stated below:

.1 Some transformers in the buildings to be demolished may contain PCBs or PCB residues.
.2 Appropriate health and safety precautions should be taken as per Contractor’s SSHSP while handling.

3.4 Preparation

.1 Inspect site and verify with Departmental Representative items designated for demolition.

.2 Confirm that electrical equipment containing PCBs has been removed.

3.5 Removal of PCB-Amended Painted Materials and Leachable-Lead Painted Materials

.1 Contractor is to minimize the amount of PAP and Leachable-Lead Painted material containerized from the structures to be demolished by disassembling the structures and containerizing only PCB-Amended Painted (PAP) materials and Leachable-Lead material.

.2 Prior to dismantling structures and facilities, remove all loose paint and place in a polyethylene bag. The use of heat to remove loose paint is not permitted. Place bags of loose paint materials in the Hazardous Waste Material Containers specified in this Section 02 61 33 - Hazardous Waste Material.

.3 During facility dismantling operations, contain paint particles and dust by the use of polyethylene sheets or other measures to seal facilities. Use drop sheets, as required, to collect paint particles that become removed from surfaces during dismantling operations. Establish a control area around these activities to provide protection to personnel from airborne paint particles. Construct control area to prevent the escape of paint chips.

.4 The use of heat (e.g. cutting torches) to cut or dismantle facilities containing paint materials is not permitted unless the paint has been removed from the areas to be cut such that excessive heating of the remaining paint does not occur. Contractor to submit to Departmental Representative evidence that torching activities will not release toxins to the atmosphere.

.5 Make note of PAP asbestos locations and containerize PAP Asbestos separately from general PAP material.

3.6 Containerization of PCB-Amended Painted (PAP) Materials

.1 Perform work required for the containerization of PCB-Amended Painted (PAP) Materials in accordance with Section 02 61 33 - Hazardous Waste Material.

3.7 Demolition

.1 Collect all paint chips and loose paint from structures prior to demolition. Containerize all paint in accordance with Section 02 61 33 - Hazardous Waste Material.

.2 Where cutting is required, collect all cuttings and sawdust associated with demolition of structures in accordance with Section 02 61 33 - Hazardous Waste Material. Conduct cutting operations such that toxins from paint or other building materials are not released to the atmosphere.

.3 Segregate PCB-amended painted (PAP) materials from non-PAP materials. Containerize all PCB-Amended (PAP) materials in accordance with the provisions of this Section. Segregate PAP Asbestos materials from non-asbestos PAP materials.

.4 Remove existing equipment, services, finishes and furnishings from buildings.

.5 Disconnect piping before tank removal and empty tanks as specified.

.6 Remove and dispose of all piping above ground as indicated and described in Section 02 61 33 - Hazardous Waste Material.

.7 Purge harmful and flammable vapours from fuel storage tanks in accordance with referenced standards prior to cutting tanks. Upon request, submit the Lower Explosive Limit (LEL) results of Volatile Organic Compound (VOC) testing to Departmental Representative.

.8 Cut structural steel and bulk fuel tanks in accordance with referenced standards.

.9 Collect fibreglass insulation material and place in polyethylene bags for disposal in the Non-Hazardous Waste Landfill.

.10 Cut non-hazardous materials in such shapes and sizes as to minimize voids when material is landfilled.

.11 Vent non-ventilated gas cylinders in a remote and safe area acceptable to Departmental Representative. Stockpile empty and ventilated gas cylinders as non-hazardous demolition debris. Do not explode or vent cylinders known or suspected to contain any ozone depleting substance including chlorodifluoromethane (freon) or halon. Containerize these materials in accordance with TDGA packaging standards.

.12 Structure foundations are to be included in the demolition of all structures. Remove completely or cut off all creosote-treated timber foundations at 300 millimetres below ground level. Cut off all other timber foundations at ground level.

.13 Completely wrap the removed creosote-treated timbers in polyethylene sheeting as specified in this Section. Bind the polyethylene sheeting with tape or other materials as required. It is not necessary to wrap each timber individually.

.14 At end of each day's work, leave work in safe condition so that no part is in danger of toppling or falling. Protect interiors of parts not to be demolished from exterior elements at all times.

.15 Demolish to minimize dusting. Keep dusty materials wetted with water only.

.16 Demolish masonry and concrete walls in small sections. Remove and lower structural framing and other heavy or large objects in a safe manner.

.17 Submit to Departmental Representative upon completion of demolition activities, a detailed inventory of all copper components removed from facilities to be demolished. The information is to include a description and dimensions of each copper component.

3.8 Salvage of Demolition Material

.1 Contractor is advised that the facilities and structures to be demolished may have salvage value. Contractor will continue to be responsible for the disposal of materials for reuse/recycling.

.2 Fuel storage tanks designated for disposal cannot be reused or salvaged, except if approved by the Departmental Representative for on-site temporary storage of wastewater or effluent.

.3 Contractor will be required to sign a Waiver Form provided by the Departmental Representative for any salvaged materials.

3.9 Disposal of Demolition Materials

.1 Dispose of non-hazardous, Lead-Painted, asbestos and hazardous materials in accordance with this Section, Sections 02 82 00.01 - Asbestos Abatement and Section 02 61 33 - Hazardous Waste Material.

3.10 Temporary Storage Area

.1 Establish a Temporary Storage Area for the storage of hazardous materials generated during demolition operations at a location approved by Departmental Representative. The Temporary Storage Area is to be located as follows:

.1 More than 100 metres away from any water body or drainage course.
.2 On stable ground not subject to flooding or seasonal saturation.
.3 In an area not routinely accessed or essential to Contractor's workforce or site personnel.
.4 More than 30 metres away from flammable materials.

.2 Establish the location and size of the Temporary Storage Area to minimize the handling of materials, isolate materials from other work operations and to provide for the collection and removal of these materials from the site. Refer to Section 31 22 15 for the grading requirements of the Temporary Storage Area.

.3 Segregate materials within the Temporary Storage Area as follows:

.1 Containerized PCB-amended Painted (PAP) materials.
.2 Containerized Hazardous Waste Materials.
.3 Leachable Lead-Painted Waste Materials

.4 Provide Departmental Representative with a detailed inventory of the Temporary Storage Area indicating the location and contents of each container, the container and assigned Environment Canada Registration numbers and packaging configuration.

.5 Provide and erect signage at access points to the Bear Island Temporary Storage Area used for the storage of containerized PCB painted materials. Signage is to be visible from all sides of the area. The English version of the sign is to read:

CAUTION
PCB STORAGE AREA
TRESPASSING IS PROHIBITED

.6 Signage must be posted in English. All lettering is to conform to CAN3-Z321-77, or latest edition thereof. All lettering is to be black, not less than 100 millimetres high, with a 25 millimetres wide stroke, on a white background.

.7 Keep PCB storage containers locked or equivalently secured to prevent unauthorized access to stored materials.

.1 Permit only authorized personnel to enter the PCB storage area.
.2 Make PCB storage containers accessible to authorized inspectors as required by Departmental Representative.

.8 Place rows of storage containers at a minimum of one (1) metre offset so that Container and Environment Canada Registration numbers remain visible.

.9 Store sufficient sorbent materials or an approved spill kit near the Temporary Storage Area for an emergency clean up.

3.11 Site Grading and Restoration

.1 Upon completion of demolition work, remove debris and leave work sites clean to a condition satisfactory to Departmental Representative.

.2 Grade building sites and restore all areas affected by demolition work in accordance with Section 31 22 15 - Grading.

.3 Reshape or backfill with Type 3 Granular Fill in accordance with Section 31 22 15 - Grading, areas excavated to facilitate demolition requirements. Place Type 3 Granular Fill in holes from which timber piles were removed.

3.12 On-Site Burning of Untreated Wooden Debris

.1 Burn all Untreated Wooden Debris.

.2 Provide an ash collection system capable of containing ash until it is sampled. A water-tight metal tray with sides of at least 300 millimetres high is acceptable. A tray from materials on-site is acceptable. Provide means to protect the ash from wind and water until it is sampled.

.3 A leachate extraction test is to be carried out by Departmental Representative on the solid residual material resulting from the burning process. The leachate toxicity of the material will be determined in accordance with Appendix 4 of Part 2 of the TDGA. Dispose of materials found to be non-hazardous in Contractor's Non-Hazardous Waste Disposal Facility. Dispose of materials found not to be leachate toxic, but exceeding Tier II contaminated soil criteria as described in Section 02 55 13 - Contaminated Soil. Package leachate toxic material in accordance with TDGA regulations, as required, and dispose of as described in this Section.

.4 Adhere to all requirements of the Burn Permit.

FIGURE 1

A T T E N T I O N	
CONTAMINATED WITH PCBs (CHLOROBIPHENYLS)	**CONTAMINÉ PAR BPC (BIPHÉNYLES CHLORÉS)**
THE CONTENTS OF THIS EQUIPMENT ARE CONTAMINATED WITH PCBs. A TOXIC SUBSTANCE LISTED IN SCHEDULE I OF THE CANADIAN ENVIRONMENTAL PROTECTION ACT. IN CASE OF AN ACCIDENT OR A SPILL OR FOR DISPOSAL INFORMATION, CONTACT THE NEAREST OFFICE OF ENVIRONMENTAL PROTECTION, ENVIRONMENT CANADA.	LE CONTENU DE CET EQUIPEMENT EST CONTAMINE PAR DES BPC, SUBSTANCE TOXIQUE INSCRITE Á L'ANNEXE I DE LA LOI CANADIENNE SUR LA PROTECTION DE L'ENVIRONNEMENT EN CAS D'ACCIDENT OU DE DEVERSEMENT, OU POUR SAVOIR COMMENT L'ELIMINER, CONTACTER LE BUREAU DE LA PROTECTION DE L'ENVIRONNEMENT, ENVIRONNEMENT CANADA, LE PLUS PROCHE.
PCB CONCENTRATION (parts per million) CONCENTRATION DE BPC (parties par million) _____	
DATE ANALYSED DATE D'ANALYSE _____	
COMPANY NAME NOM DE LA COMPAGNIE _____	
AUTHORIZED COMPANY OFFICIAL AGENT OFFICIEL AUTORISE _____	

FIGURE 2

END OF SECTION

PART 1 GENERAL

1.1 Description

.1 This Section specifies the requirements for the excavation, removal, sorting, handling and disposal, incineration or off-site transport and disposal of partially buried and scattered debris over the site area.

.2 An inventory of the known debris, including estimated crushed volumes, at the Bear Island Site is provided in Appendix B.

1.2 Definitions

.1 Known Debris: Scattered visible debris on the existing ground surface, including open storage areas, or visible, partially buried debris within 0.5 metres of the existing ground surface or debris located within a two (2) metre depth of water (less than 10 metres from low water line) and consisting of hazardous and non-hazardous material, and that:

.1 has been identified as debris to be removed; or
.2 is located approximately within 50 metres of any access road or water course on the site.
.3 is located within a water body, within 10 metres of shore.

.2 Unknown Debris: Scattered debris on the existing ground surface and/or partially buried debris consisting of hazardous and non-hazardous material other than the Known Debris described above.

.3 Hazardous Waste Materials: Waste materials that are designated as hazardous under Territorial or Federal Legislation or as dangerous goods under the TDGA or CEPA (See Section 02 61 33 - Hazardous Materials).

.4 Non-Hazardous Waste Materials: Waste materials that are not designated as hazardous under Territorial or Federal Legislation, including double-bagged asbestos.

1.3 Measurement for Payment

.1 Include all direct costs for the Collection and Disposal of all known non-hazardous debris in the lump sum price for Known Debris Removal, Item 02 41 23-1 in the Basis of Payment Schedule.

.2 The scope of work for payment Item 02 41 23-1 - Known Debris Removal is to include, but is not limited to:

.1 Collection, segregation, and consolidation of all known non-hazardous debris from the Bear Island Site
.2 On-site incineration of all untreated wooden debris and disposal of all other Known Debris in the on-site Non-Hazardous Waste Landfill.
.3 Provision and operation of a barrel crusher on site, including provision of all sorbent materials required to contain spills and/or contaminated run-off. Excavation and disposal of contaminated soils produced from the barrel crushing operations will be at Contractor’s cost.

.3 All costs for the collection and disposal of unknown non-hazardous surface debris will not be considered for payment under Section 02 41 23 - Debris and Miscellaneous Removals, but will be negotiated with Departmental Representative using the Labour and Materials rates provided in the Potential Additional Work section of the Basis of Payment Schedule.

.4 The collection and containerization of Lead Painted materials at the Beach Area will be measured for payment by the cubic meter of containerized Lead Painted materials, as placed in the hazardous waste container. Collection and Containerization of Lead Painted materials will be paid under Item 02 41 23-2 as indicated in the Basis of Payment Schedule.

.5 The collection and disposal of vehicles (except those classified as hazardous debris) will not be measured. Payment will be included under Item 02 41 23-1, Surface Debris Removal, as indicated in the Basis of Payment Schedule.

.6 Collection and disposal of liquids from within vehicles to be disposed of will be negotiated with the Departmental Representative using the Labour and Materials rates provided in the Potential Additional Work section of the Basis of Payment Schedule.

.7 The following work items will be incidental to the work described in this Section, and will not be measured separately:

.1 Collection and sorting, as required of all non-hazardous debris.
.2 Provision of an incinerator and incineration of all Untreated Wooden Debris.
.3 Cutting, crushing and placement of this material into the on-site Non-Hazardous Waste Landfill.
.4 Reshaping associated with the removal of debris.
.5 Labour, materials and equipment required to remove existing culverts from the site roads.

.8 Except as indicated above, work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules - Bar (GANTT) Chart.

PART 2 PRODUCTS

2.1 Materials

.1 Hazardous Waste Containers for hazardous waste materials in accordance with Section 02 61 33 - Hazardous Waste Material.

PART 3 EXECUTION

3.1 Protection Procedures

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

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

.3 Remove oil, fuel, antifreeze and brake fluid from vehicles and equipment to be disposed of.

3.2 Removal and Sorting

.1 Examine the area(s) to assess the material type and nature of the debris.

.2 Proceed with the collection and removal of debris if, based on the visual assessment, the debris is determined to be non-hazardous.

.3 Contractor's Hazardous Materials Specialist to continuously monitor the operation to identify potentially hazardous material.

.4 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.

.5 Store suspicious material in a secured area in secured containers, if the nature of the material or debris can't be confirmed, notify Departmental Representative about the findings. Testing for classification of hazardous products will be carried out and paid for by Departmental Representative.

.6 Completely remove partially buried debris unless otherwise directed by Departmental Representative.

.7 Advise Departmental Representative of any stained soils encountered during debris removal operations. If authorized by Departmental Representative, excavate stained and contaminated soil areas, identified during debris removal operations, in accordance with the requirements of Section 02 55 13 - Contaminated Soil. Testing for classification and confirmatory testing will be carried out and paid for by Departmental Representative.

.8 Clean empty barrels in accordance with the requirements of Section 02 61 33 - Hazardous Waste Material. Crush the clean empty barrels in a manner to reduce the total original barrel volume by a minimum of 75 percent.

END OF SECTION

PART 1 GENERAL

1.1 Description

.1 This Section specifies requirements for:

.1 the grading of designated areas including existing landfills, granular borrow areas, site debris areas, depressions created by the removal of debris and contaminated soil, and general site areas requiring regrading and reshaping; and

.2 the supply and placement of granular fill materials.

.2 Designated areas are indicated for design grades, contours, design elevations, and cover soil thicknesses.

1.2 Definitions

.1 Reshaping: The levelling and grading, to a maximum depth of 600 millimetres, including the movement of boulders, of designated areas to blend in with the natural terrain and provide positive drainage. Reshaping does not require the supply and placement of additional granular fill material. Excavation of the terrain to a depth greater than 600 millimetres during reshaping operations is to be considered as unclassified excavation.

.2 Scarifying: The disturbance or loosening of a soil to a minimum depth of 300 millimetres to allow for compaction or aeration.

.3 Regrading: The supply and placement of granular fill in designated areas to blend in with the natural terrain and provide positive drainage.

.4 Unclassified Excavations: Excavation of materials of whatever nature encountered in the work to a depth greater than 600 millimetres.

.5 Granular Fill: Type 2, Type 3 and Type 6 material as specified in Section 31 05 17 – Aggregate Materials.

.6 Berm: Granular fill, type as indicated on the Drawings, placed above the original ground and built-up to a design elevation.

.7 Intermediate Cover: Tier I contaminated soils or Type 6 Granular Fill, as designated by Departmental Representative, used to cover each waste layer and fill void spaces within the landfilled waste.

.8 Final Cover: Type 2 Granular Fill, or as indicated on the Drawings, placed over existing landfills to be regraded and over landfilled waste.

.9 Surficial Boulders: visible rocks with a nominal diameter of 300 millimetres or greater.

.10 General Fill: Type 3 Granular fill used for regrading low areas and to replace excavated contaminated soil.

.11 Waste Material: Excavated material unsuitable for use in work or surplus to requirements.

.12 Borrow Material: Material obtained from approved areas and required for regrading requirements.

.13 Specific classifications of granular materials are described in Section 31 05 17 – Aggregate Materials.

.14 Maximum Dry Density is determined by the Standard Proctor Method in accordance with ASTM D698. It is applicable if less than 30% of the material is retained on the ASTM 19 millimetre sieve.

.15 Corrected maximum dry density is applicable if more than 30% of the material is retained on the ASTM 19 millimetre sieve. It is defined as:

.1 $$D = \frac{D1 \times D2}{(F1)(D2) + (F2)(D1)}$$

.2 Where:

D = corrected maximum dry density kg/m³
F1 = fraction (decimal) of total field sample passing ASTM 19.0 millimetre sieve
F2 = fraction (decimal) of total field sample retained on ASTM 19.0 millimetre sieve (equal to 1.00 - F1)
D1 = maximum dry density, kg/m³ of material passing ASTM 19.0 millimetre sieve determined in accordance with Method C of ASTM D698 or latest edition thereof.
D2 = bulk density, kg/m³ of material retained on ASTM 19.0 millimetre sieve, equal to 1,000 G where G is bulk specific gravity (dry basis) of material when tested to ASTM C127-84, or latest edition thereof.

1.3 Site Conditions

.1 Suspend grading operations whenever climatic conditions are unsatisfactory for grading to conform with this Specification.

.2 Do not operate equipment in work areas until the material has dried sufficiently to prevent excessive rutting.

.3 Areas to be graded are to be free from debris and excessive snow, ice or standing water.

.4 Contractor is advised that soft ground conditions may be prevalent at the site during periods of maximum thaw of the permafrost. Schedule and carry out work to minimize disturbance to permafrost soils.

.5 Contractor is advised that existing access roads to be used during construction activities may require repair and upgrading.

1.4 Protection

.1 Prevent damage to benchmarks, existing buildings, surface or underground service or utility lines which are to remain. Immediately repair any damage to the above or replace the above in the event of damage, at no cost to Departmental Representative.

.2 Protect archaeological sites from construction and construction traffic.

.3 Protect unanticipated archaeological resources encountered during construction, suspend all activities in that area and notify Departmental Representative immediately.

.4 Protect monitoring wells and existing survey monuments. Repair or replace, at no cost to the Departmental Representative, any monitoring wells or existing survey monuments damaged by the Contractor's operations.

.5 Protect and do not disturb fish spawning beds and breeding grounds during construction.

.6 Environmental protection measures are to be in accordance with the requirements specified in Section 01 35 43 - Environmental Protection. Follow the approved Erosion, Sediment and Drainage Control Plan submitted in accordance with Section 01 35 43 - Environmental Procedures.

1.5 Upgrading and Maintenance of Airstrip and Site Access Roads

.1 The site access road was constructed and utilized during the operation of the Bear Island Mid Canada Radar Station and has not been maintained recently. The access road network is approximately 5 km in length and extends between the Airstrip, South Doppler, Beach and POL and North Doppler Areas.

.2 The Bear Island Airstrip is approximately 1500 metres long and the south end of the airstrip is located approximately 500 m west of the South Doppler Area.

.3 The access road has not been maintained regularly and there are some settlement and washout areas, and exposed bedrock at various locations. A Geotechnical Evaluation for the various site areas was undertaken by EBA Engineering as part of the Earth Tech, Environmental Site Assessment in 2008.

.4 Provide Access Road upgrades and maintenance, including culverts, to facilitate the site remediation/construction activities. Summarize the proposed Airstrip and Access Road upgrade and maintenance activities in an Airstrip and Access Road Upgrade and Maintenance Plan in sufficient detail to satisfy regulatory requirements. Submit the Access Road Upgrade and Maintenance to the Engineer for approval a maximum of 30 days after contract award. Incorporate materials required by the Airstrip and Access Road Upgrade Plan into the mobilization requirements.

1.6 Samples

.1 Inform Departmental Representative of proposed source of fill materials and provide access for sampling. Give a reasonable amount of notice to allow for lab analysis of samples.

1.7 Submittals

.1 Submit to Departmental Representative, three (3) hard copies and one (1) electronic copy of Contractor’s plan to upgrade site access roads and airstrip thirty (30) days after contract award, in accordance with Section 01 33 00 - Submittal Procedures.

1.8 Measurement for Payment

.1 For items to be measured for payment by survey, survey the area to receive granular fill either by cross section or by grid, following removal/stripping (if required) of surface material. Survey significant breaks in the original ground surface grade, incorporating at minimum the cross section locations indicated on the Drawings. The maximum distance between cross sections or grid points is to not exceed 20 metres unless otherwise indicated by Departmental Representative. Survey measurements are to be to the nearest 0.01 metre. Following placement of granular fill material, Contractor is to resurvey the cross sections or grid points. The volume measurement of granular material for payment will be determined by digital terrain model or average end area method, as Departmental Representative deems appropriate for the survey information provided. Preference is to be for quantity determination by digital terrain model.

.2 For items to be measured for payment by truck box measurement, Departmental Representative will measure the capacity of the gravel hauling vehicles. The measurements will be to the nearest 0.1 cubic metre capacity, and the capacity of the vehicle once measured is to not be changed without the consent of Departmental Representative. The gravel is to be levelled, using a strike-off method, by Contractor before measurement. No heaping or mounding of the load above the top of the box level will be allowed. Once the capacities of the truck boxes have been established, Departmental Representative may, at his own discretion, determine the granular material volume without enforcing the strike-off method. Truck boxes used in the haul of gravel are to be thoroughly cleaned when unloading. The following Bulking Factors will be applied to truck box measurements:

Material	Bulking Factor
Granular Materials	15%
Debris	50%

.3 The unit of measurement for reshaping within designated areas indicated and to limits authorized by Departmental Representative will be by the square metre as measured by survey. Reshaping associated with earthworks, including, but not limited to, placement of granular materials, regrading or levelling of areas prior to construction, is not to be measured as part of reshaping, but is to be considered incidental to the unit price bid for such earthworks. Areas on the drawings requiring levelling prior to construction will not be considered for payment under reshaping, unless explicitly noted on the Drawings, or authorized by the Departmental Representative. Reshaping will be paid under Item 31 22 15-1 of the Basis of Payment Schedule.

.4 The supply, placement and compaction of Type 2 Granular Fill for berms and cover of the Non-Hazardous Waste Landfill and regrading of buried debris as shown on the drawings will be measured for payment by the cubic metre as determined by survey methods. Type 2 Granular Fill will be paid under Item 31 22 15-2 in the Basis of Payment Schedule.

.5 The supply, placement and compaction of Type 3 Granular Fill for general regrading operations will be measured for payment by the cubic metre as determined by survey methods. Type 3 Granular Fill will be paid under Item 31 22 15-3 in the Basis of Payment Schedule.

.6 The processing, loading, hauling, placement and compaction of Type 6 Granular Fill for the Non-Hazardous Waste Landfill will be measured for payment by the cubic metre as determined by truck box measurement. Tier I and/or F3/F4 contaminated soil is to be used as Type 6 Granular Fill as directed by Departmental Representative and will not be paid under Item 31 22 15-4 in the Basis of Payment. Type 6 Granular Fill requirements will be paid under Item 31 22 15-4 in the Basis of Payment Schedule.

.7 Excavation required for the following work items will be measured for payment by the cubic metre as determined by survey measurement, and paid under Item 31 22 15-5, Unclassified Excavation in the Basis of Payment Schedule:

.1 Excavation of the terrain to a depth greater than 600 millimetres during reshaping operations, as directed by the Departmental Representative.
.2 Excavation as specifically indicated or as directed by Departmental Representative.
.3 Excavation of clean soils over contaminated soils.

.8 The excavation and backfilling of test pits, including restoration of original ground, as directed by Departmental Representative, using adequate mechanical excavating equipment, to a maximum depth of 2 metres will be measured for payment by the operating hours for the excavating equipment utilized, and paid under unit cost items for labour and equipment Item 31 22 15-6 of the Basis of Payment Schedule. The unit price for the excavation equipment is to include all ownership, operating and supervisory costs including costs for the equipment operator, fuel, lubricants, labour, and parts necessary to maintain the equipment.

.9 All costs for the upgrading and maintenance of the Airstrip and Site Access Roads, including preparation of the Airstrip and Site Access Road Upgrading and Maintenance Plan, to facilitate the work described under the provisions of this specification are to be included in the lump sum price for Upgrading and Maintenance of Airstrip and Site Access Roads, Item 31 22 15-7, as indicated in the Basis of Payment Schedule.

.10 The following work items will be incidental to the work described in this Section, and will not be measured separately:

.1 Stripping, stockpiling and replacement or placement to a new location of organic material from the borrow areas as directed by Departmental Representative, and where required from construction areas upon where granular material is to be placed.
.2 Disposal of waste material from the borrow areas.
.3 Removal of surficial boulders over 300 millimetres in diameter from construction areas.
.4 Excavating, separating, processing, screening, and stockpiling of borrow materials.
.5 Reshaping of areas with ponded water (standing water covering over five (5) square metres and more than 0.2 metres deep) and rutting (ruts more than 0.1 metres deep) caused by contractor's construction activities.
.6 Grading of borrow areas to approximate the before-construction condition upon completion.
.7 Loading, hauling and haul road construction, maintenance and rehabilitation.
.8 Water for moisture conditioning, compaction and dust control.

.9 All construction surveying, including layout of facilities, slope staking, and supply and installation of witness grade stakes to monitor the depth of granular material placement.
.10 Surveying and calculation of granular material quantities for progress payment purposes.
.11 Reshaping and regrading of Contractor's laydown areas including the supply, placement and compaction of granular material.
.12 Draining of wet areas prior to regrading operations.
.13 Removal and disposal or burial of abandoned utility lines exposed by Contractor during the excavation or granular materials.
.14 Work undertaken to drain borrow areas prior to excavation.

.11 No measurement for payment will be made for:

.1 Rejected material.
.2 Surplus material.
.3 Excavation, and stripping and replacement of organic material beyond specified limits.
.4 Excavation to prove borrow sources.
.5 Placement of granular fill beyond the limits and depths specified, unless specifically authorized by Departmental Representative.

.12 Except as indicated above, work under this section will not be measured. Include all costs in Item BOPC-1, Balance of Project Costs in the Basis of Payment Schedule. Indicate the cost of this work as a separate line item in the cost breakdown specified in Section 01 32 18 -Construction Progress Schedules – Bar (GANTT) Chart.

PART 2 PRODUCTS

2.1 Materials

.1 Fill materials in accordance with Section 31 05 17 - Aggregate Materials.

.2 Fill materials require the approval of Departmental Representative.

.3 There is a requirement to selectively acquire, blend and/or screen granular materials to satisfy gradation specifications as indicated in Section 31 05 17 - Aggregate Materials.

PART 3 EXECUTION

3.1 Site Preparation

.1 Unless specifically indicated, do not remove existing topsoil or organic materials from embankment construction areas. Remove exposed surface boulders over 300 millimetres in diameter that are located in areas to receive granular fill. Dispose of boulders by placing on embankment side slopes.

.2 Borrow Excavation:

.1 Obtain from potential borrow areas as indicated, or provide from own sources, all required fill material.
.2 The existing operational pads, roadways and airstrip at the site are not to be used as granular material borrow sources unless specifically authorized by Departmental Representative.

.3 Advise Departmental Representative of selected borrow areas seven days in advance of excavation operations for appropriate testing to be performed.

.4 Notify Departmental Representative whenever unsuitable materials are encountered in borrow areas.

.5 Borrow material cannot be obtained from existing granular pads beneath facilities to be demolished, unless authorized in writing by Departmental Representative.

.1 Remove and dispose of any abandoned utility lines in these areas in accordance with Section 02 41 16 - Structure Demolition.

.6 Stripping, stockpiling and replacement or placement to a new location of organic material and stripping and disposal of waste material found when excavating existing granular fills to be as directed by Departmental Representative.

.7 Final grading of borrow area upon completion to be tidy, well drained, free of standing water all to the satisfaction of Departmental Representative.

.8 Upon completion of final grading, leave all slopes in a stable condition and spread all stripped organics.

.9 Transport aggregate from borrow areas to the work areas via existing access routes where available. Maintain and provide for dust control on the access route between the borrow area and the work areas.

3.2 Placement, Moisture Conditioning, and Compaction of Granular Fill Material

.1 Set grades and lay out work in detail from control points in areas of granular fill placement. Verify the original ground topography by survey.

.2 Haul granular fill material from borrow sites to designated areas.

.3 Place granular fill material to the lines, grades, elevations and dimensions indicated, or agreed to with Departmental Representative.

.4 Do not place granular fill on snow or surface ice.

.5 Maintain natural drainage patterns, unless otherwise directed, and fill depressions to avoid any ponding of water adjacent to embankments.

.6 All fill material are to be placed in an unfrozen state. Fill material to be free from debris, snow and ice. Do not place granular fill if the outside air temperature is below zero degrees Celsius, unless otherwise directed by Departmental Representative.

.7 Maintain a crowned surface during construction to ensure ready runoff of surface water. Do not place material in free standing water. Drain low areas, before placing material.

.8 Do not dump fill material over the side slopes of berms.

.9 Place and compact fill material in horizontal lifts.

.10 Cease construction at any sign of movement or bulging in the embankments to allow assessment by Departmental Representative.

.11 For fill depths greater than 500 millimetres, place granular material in lifts not exceeding 250 mm in loose thickness. For fill depths greater than 200 millimetres and less than 500 millimetres, place material in two lifts of equal depth. For fill depths less than 200 millimetres, place material in one lift. Place intermediate fill as indicated.

.12 Moisture condition granular fill as required to meet compaction requirements. Provide a water truck capable of efficiently placing water on granular fill. If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected.

.13 Compact Type 2 and Type 3 Granular Fill material to a minimum of 95 percent of Maximum Dry Density determined in accordance with ASTM D698 or as determined from a Control Strip Density. The method for determining the maximum dry density will be established by the Departmental Representative.

.14 Control Strip Density:

.1 A Control Strip is a lift of granular material placed over a minimum 300 square metres area that requires regrading.
.2 To determine the Control Density, moisture and density readings are to be taken by Departmental Representative during the compaction process until a maximum dry density is attained.
.3 The density and moisture content of the Control Strip are to be measured by Departmental Representative after each pass of the compaction equipment to determine the type of equipment and number of passes required to obtain the specified density.
.4 A new Control Strip will be required if, as established by Departmental Representative, the material type, moisture content, or subgrade of the area to be regraded is significantly different than that of the Control Strip.
.5 Proofroll areas compacted in accordance with the Control Strip Density upon completion of grading and compaction or as requested by Departmental Representative.
.6 Use a fully loaded tandem axle gravel truck for the proofrolling operation. The speed of the vehicle is not to exceed four (4) kilometres per hour during proof rolling. Departmental Representative may authorize the use of alternative proofrolling equipment.
.7 Make sufficient passes with the proofrolling equipment to subject every point on the surface to three separate passes of a loaded tire.
.8 Where proofrolling reveals areas of defective granular fill, remove and recompact the granular fill, and modify the compaction process, as required.
.9 The Control Strip Density method for compaction is not intended to relax the specified compaction requirements, but to reduce compaction testing requirements.

.15 If granular fill has dried out prematurely due to weather conditions, scarify surface, adjust moisture condition and recompact at Departmental Representative's discretion. No extra payment will be made for extra costs incurred as a result of any extra work.

.16 Compaction equipment must be capable of obtaining required densities uniformly in materials on project. Hand equipment must be available for compaction in areas where large equipment can not access and around instrumentation. Tracked or tired equipment may be substituted for dedicated compaction equipment, provided it can demonstrate satisfactory compactive effort.

.17 Following compaction of Type 2 and Type 3 material placed on slopes, travel in a direction parallel to the slope direction with a cat-track to create small ridges in the slope. In soft ground, travel in a direction parallel to the toe of the slope with a cat track.

.18 Shape finished surface to required cross-section and grade, or as directed by Departmental Representative.

3.3 Regrading

.1 Supply, place, blade and trim Type 2 or Type 3 granular fill material to elevation, grades, and cross-section dimensions indicated or directed by Departmental Representative.

.2 Supply and install witness grade stakes in areas to be regraded to monitor the depth of granular material. The grade stakes are to be placed on a grid spacing approved by Departmental Representative for each specific regrade area. Immediately replace all grade stakes that are damaged or displaced by Contractor operations.

3.4 Reshaping

.1 Obtain authorization from Departmental Representative prior to beginning reshaping operations.

.2 Blade and trim material to elevation, grades, and cross-section dimensions indicated or directed by Departmental Representative. Obtain Department Representative's approval before reshaping any area.

.3 Make use of material within the area designated for reshaping to provide a surface that is smooth and compact with firm slopes.

.4 Remove or cover debris exposed during reshaping with a minimum depth of Type 2 granular fill as directed by Departmental Representative.

.5 Blend the final reshaped surface with the natural terrain and provide positive drainage.

3.5 Excavating

.1 Lay out work in detail from control points in areas of excavation. Verify the original ground topography by survey. If survey verification is not completed, original ground is to be as shown on the Drawings.

.2 Excavate to lines, grades, elevations and dimensions as indicated on the Drawings or designated by Departmental Representative.

.3 Keep excavations free of water while work is in progress. Protect open excavations against flooding and damage due to surface run-off. Dispose of water in a manner not detrimental to work completed or under construction. The release of all water resulting from the dewatering of open excavations is to conform to the Wastewater Discharge Criteria outlined in Section 01 35 15 - Special Project Procedures for Contaminated Sites, and may require temporary storage or treatment prior to discharge.

.4 Dispose of excavated material at approved locations. Do not obstruct flow of surface drainage or natural watercourses.

.5 Where required due to unauthorized over-excavation, fill under areas with Type 3 Granular Fill, as directed by Departmental Representative, compacted to a minimum 95 percent of Maximum Dry Density in accordance with ASTM D698.

3.6 Backfilling

.1 For backfilling operations, use compaction equipment capable of obtaining required densities in materials on project.

.2 Do not proceed with backfilling operations until Departmental Representative has inspected and approved excavation.

.3 Areas to be backfilled are to be free from debris, snow, ice and water.

.4 Commence backfilling of excavated soil areas within 1 day of receipt of confirmatory sampling results indicating no further excavation in the area is required. Costs for any extra work caused as a result of leaving excavations open longer will be the responsibility of Contractor.

.5 Place specified backfill material in uniform horizontal layers in depths to grades indicated. Compact each layer before placing succeeding layer.

.6 No trenches or excavations are to be left open during the winter.

3.7 Temporary Storage Area

.1 Develop a Temporary Storage Area for the storage of containerized hazardous waste materials and contaminated soil.

.2 Prepare the Temporary Storage Area to comply with the following:

.1 Provide easy access to the off-site transport equipment.
.2 Allow the 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 soil. Supply, place and compact additional granular fill as required.
.6 Locate at least 100 metres from any body of water.
.7 In an area not routinely accessed or essential to Contractor’s workforce or site personnel.
.8 More than 30 metres away from flammable materials.

.3 Confirm the location of the Temporary Storage Area with Departmental Representative at least one (1) week prior to commencing operations to allow for baseline sampling by Departmental Representative.

.4 Within the Temporary Storage Areas, segregate the various types of containerized materials as described in Section 02 61 33 - Hazardous Materials.

.5 Provide signage for Temporary Storage Area in accordance with Section 02 61 33 – Hazardous Waste Materials.

3.8 Landfilling

.1 Lay out work in detail from survey control points. Verify the original ground topography by survey. If survey verification is not completed, original ground is to be as shown on the Drawings.

.2 Construct perimeter berms of granular fill to the dimensions as indicated.

.3 Landfilling Non-Hazardous Wastes

.1 Place non-hazardous material in the designated area(s) in uniform, horizontal lifts between and against the berm as shown on the Drawings. The thickness of each waste lift is to be such that all voids within the waste can be filled with intermediate cover. The maximum thickness of each waste lift is to not exceed 0.5 metres.

.2 Compact waste during placement with a double steel drum compactor or approved alternative during placing and spreading of the waste material. The equipment must be capable of crushing demolition debris.

.3 For placement in landfills, cut all demolition material and debris as required:

.1 to minimize displacement and lifting of landfilled materials resulting from landfill compaction operations;

.2 so that the maximum depth of any one material component within the landfill does not exceed 0.5 metre; and

.3 to satisfy the overall landfill dimension requirements as indicated on the Drawings.

.4 large equipment/vehicles shall be cut to length and reduced in volume at the recommendation and discretion of the on-site Departmental Representative.

.4 Cut structural steel materials into separate members prior to placement in landfills. Place large materials including structural steel members, timbers, communication dishes, etc. on the base of the landfill or on the base of an intermediate cover layer so that the materials lay on a compacted, flat surface. Cut hollow components or objects, such as tanks, as required, to allow for nesting of materials. As a minimum, hollow components are to be cut in half parallel to the lengthwise axis. Within the landfill, support the underside of nested materials with intermediate cover or other debris material to minimize displacement and lifting of materials.

.5 Segregate all asbestos material from other material, and consolidate in one single location within the landfill. The proposed location of the asbestos waste within the landfill is to be reviewed by Departmental Representative. Record the specific location and depth of this material on the Project Record Drawings.

.6 Hand place double bagged asbestos in the landfill. Provide daily intermediate cover of minimum 150 millimetre Type 6 fill on asbestos waste. Do not operate equipment directly on asbestos waste containers. Replace ripped or torn asbestos waste bags. Location and quantity of asbestos shall be surveyed and recorded on the final landfill as-built drawings.

.7 Crush, cut or shred barrels to be landfilled on site to reduce the total original barrel volume by a minimum of 75 percent.

.8 Place Tier I Contaminated Soils as intermediate cover to a maximum loose thickness of 150 millimetres over each layer of non-hazardous material or as required to infill voids within the waste layer, and compact with the random action of tracked equipment. Make sufficient passes with the tracked equipment to subject every point on the surface to a minimum of three separate passes.

.9 The number of layers of 150 millimetres deep intermediate cover to be placed within the landfill is dependent on the total depth of waste material to be placed as follows:

Total Waste Material Depth	Number of Intermediate Cover Layers
<0.5	1
≥ 0.5 metre, < 1.0 metre	2
≥ 1.0 metre, < 1.5 metres	3
≥ 1.5 metres, < 2.0 metres	4
≥ 2.0 metres, < 2.5 metres	5
≥ 2.5 metres, < 3.0 metres	6

.10 Place additional Intermediate Fill material on the final lift of debris to a level that all debris is covered prior to placement of Type 2 cover.

.11 Stockpile Intermediate Fill adjacent to landfilling operations. Ensure that a stockpile is continuously maintained.

.12 Place and compact to a minimum of 95 percent of Maximum Dry Density, additional intermediate cover material, as required, to completely infill voids within the waste layer prior to proceeding with the placement of the next overlying waste layer and prior to placement of final cover.

.13 Take special care to place and compact intermediate cover material against exposed rock faces and areas inaccessible to tracked compaction equipment to specified requirements.

.14 In the event that the landfill is not constructed, filled, and capped in one construction season, winterize the landfill by placing and compacting a temporary 0.5 metre cap of clean material over extents of placed waste. The temporary cap will be removed at the beginning of the following construction season prior to placing additional waste.

.15 Do not place final cover (Type 2 Granular Fill) until Departmental Representative has determined that there is sufficient Type 6 intermediate cover.

.16 Construct final cover over landfill to the specified thicknesses and grades as indicated.

3.9 Testing

.1 Testing of materials and compaction testing will be carried out and paid for by Departmental Representative.

.2 Frequency of testing will be determined by Departmental Representative.

3.10 Finishing and Tolerances

.1 All areas to be covered with granular material are to be uniform without projections or depressions exceeding 100 millimetres in three (3) metres.

.2 Granular fill surfaces to be within 100 millimetres of design elevations but not uniformly high or low.

.3 Finished surfaces are to be graded to promote positive drainage and minimize standing water.

3.11 Maintenance

.1 Maintain finished surfaces in a condition in accordance with this Section until succeeding material is applied or until acceptance.

END OF SECTION