

PSPC Ontario Region
R.106042.001
2020-05-08

Section 00 00 00
SPECIFICATION TITLE SHEET
Page 1

PROJECT TITLE THUNDER BAY AIRPORT FIREFIGHTING TRAINING AREA (FTA) REMEDIATION

PROJECT NUMBER R.106042.001

PROJECT DATE 2020-05-08

Design Professionals:



END OF SECTION

<u>Section Number</u>	<u>Section Title</u>	<u>No. of Pages</u>
Division 00	Procurement and Contracting Requirements	
00 01 07	Seals Page	1
Division 01	General Requirements	
01 11 00	Summary of Work	4
01 11 06	General Instructions for Site Remediation	4
01 14 00	Work Restrictions	2
01 31 19	Project Meetings	3
01 32 16.07	Construction Project Schedule – Bar (GANTT) Chart	4
01 33 00	Submittals	5
01 35 13	Special Procedures for Airport Facilities	2
01 35 13.43	Special Project Procedures for Contaminated Sites	7
01 35 29	Health and Safety Requirements	7
01 35 43	Environmental Procedures	9
01 45 00	Quality Control	2
01 51 00	Temporary Utilities	1
01 52 00	Construction Facilities	4
01 56 00	Temporary Barriers and Enclosures	1
01 71 00	Examination and Preparation	2
01 74 00	Cleaning	2
01 74 20	Construction/Demolition Waste Management and Disposal	1
01 77 00	Closeout Procedures	2
01 78 00	Closeout Submittals	3
Division 02	Existing Conditions	
02 41 99	Demolition for Minor Works	2
02 50 13	Management of Toxic Waste	2
02 61 00.01	Soil Remediation	10
Division 31	Earthwork	
31 23 33.01	Excavating, Trenching and Backfilling	5
31 32 19.01	Geotextiles	2
<u>Drawing Number</u>	<u>Drawing Title</u>	
C01	Site Plan (Phase 1)	
C02	Removals Plan (Phase 2 to 5)	
C03	Section B (Phases 2 to 5)	
C04	Section C (Phases 2 to 5)	
C05	Reinstatement Plan (Phase 6)	
Appendix A	Documents for Information	
	Select Text from the Limited RAP	

Appendix B

Permit Application Forms

TBIAAI Facility Alteration Permit

Transport Canada Plan of Construction Operations

Nav Canada Land Use Proposal

END OF SECTION

Part 1 General

1.1 PRECEDENCE

- .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises environmental remediation at the Firefighting Training Area (FTA) at the Thunder Bay International Airport (TBIA) in Thunder Bay, Ontario.

1.3 CONTRACT METHOD

- .1 Construct Work under Bid and Acceptance Form – Combined Price Contract.

1.4 COST BREAKDOWN

- .1 Within 48 hours of Notice of Award, furnish a cost breakdown by Section, including a breakdown of the lump sum portion of the price. The cost breakdown must include the following items at a minimum:
 - .1 Health and Safety, including Site-specific Health and Safety Plan.
 - .2 Plan Development, including all plans necessary to be submitted prior to any aspect of the construction proceeding.
 - .3 Site Security.
 - .4 Erosion and Sediment Control.
 - .5 Temporary Utilities and Utility Work.
 - .6 Traffic Control.
 - .7 Temporary Barriers and Enclosures.
 - .8 Demolition, removal and disposal of foundations, debris.
 - .9 Water Management.
 - .10 Site Restoration.
 - .11 Closeout Reporting and Submittals.
- .2 Within 48 hours of acceptance of bid, submit a list of subcontractors.
- .3 Submit cost breakdown in accordance with Section 01 33 00.

1.5 DOCUMENTS FOR INFORMATION

- .1 The Contractor shall be deemed to have inspected the Documents for Information, included in Appendix A, as supplied at the time of tender and formed their own assessment of the site for the Work under the Contract. It is the Contractor's sole responsibility to fully inform themselves of the site conditions for the Work under the Contract.
- .2 The following documents are provided in Appendix A:
 - .1 Select Text from Limited RAP

1.6 PROJECT DESCRIPTION

.1 SITE DESCRIPTION

The Thunder Bay Airport is situated on approximately 3,100,000 square metres of land in the southwest region of the City of Thunder Bay, Ontario. The property includes a Former Firefighting Training Area (FFTA) that was decommissioned in 1993 when the current FTA was constructed immediately to the south of the FFTA. The FTA was constructed with a double liner system comprising a geomembrane and a compacted clay liner, complete with monitoring piping to examine the space between liners for the presence of fuels and extinguishing agents used during training exercises. Testing has identified elevated Per- and Poly-fluoroalkyl Substances (PFAS), and petroleum hydrocarbons including benzene, toluene, ethylbenzene, and xylene (PHCs + BTEX) concentrations within the FTA and in the shallow soil and groundwater surrounding the FTA. Environmental remediation of the FTA is required to prevent further contaminant release to the surrounding environment. The topography around the FFTA and FTA is generally flat and slopes downwards toward the north (Neebing River flowing eastwards) and northeast (unnamed creek flowing towards the northwest and discharging into the Neebing River). Surface water run-off from the nearby airport runway drains into this creek. The limits of the Site are defined as the FTA area and surrounding area, as shown on drawing C01.

.2 REMEDIATION

.1 Complete remediation in accordance with Section 02 61 00.01. The works generally consist of the following:

- .1 Mobilization, Utility Locates and Site Preparation.
- .2 Fuel Line Decommissioning.
- .3 Removal of Standing Water from the FTA.
- .4 Inspection and Removal of Mock-Up Fuselage.
- .5 Removal of Water between Primary and Secondary Liners.
- .6 Excavation above FTA Primary Liner.
- .7 Excavation of FTA Primary Liner.
- .8 Excavation of FTA Secondary Liner.
- .9 Excavation of FTA Monitoring Maintenance Holes.
- .10 Assistance with Soil Sampling of Native Soil (Conducted by the Departmental Representative).
- .11 Installation of Geotextile Liner and Backfill of FTA.

.3 SITE ACCESS

- .1 Access to the site will be by municipal roads and private airport roads.
- .2 Access to the site must be coordinated with the Thunder Bay International Airport Authority Inc. (TBIAAI) prior to work.
- .3 The Contractor shall confirm specific access restrictions with TBIAAI prior to commencing work.

.4 WORKING AREAS / VEGETATION CLEARANCE

- .1 Limit working areas to those identified.
- .2 No clearing of vegetation will be required.

.5 ENVIRONMENTAL MONITORING

- .1 The lateral and depth limits of the remediation are as specified.

1.7 CONTRACTOR USE OF PREMISES

- .1 Reasonable use of site until Certificate of Substantial Performance, subject to the Site Access Agreement.
- .1 Use only premises as directed by Departmental Representative.
- .1 Account for use of premises upon request by TBIAAI or Departmental Representative.
- .2 Site operations may be present during work. Site operations take precedence over work in this Contract; however, all reasonable allowances will be made for work in this Contract to be completed without interference from site operations.
- .3 The Contractor shall comply with all security and safety precautions as communicated by the TBIAAI.
- .2 Submit the following permits within 3 days of award of contract. Obtain all permits prior to mobilization to site. The permit application forms are provided in Appendix B.
- .1 TBIAAI Facility Alteration Permit (FAP).
- .2 Transport Canada (TC) Plan of Construction Operations (PCO).
- .3 Nav Canada Land Use Proposal (LUP).
- .3 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
- .4 Repair or replace portions of existing work which have been altered during construction operations to match existing or adjoining work, to approval of Departmental Representative.
- .1 Be responsible for any loss of, or damage to any property arising out of the performance of the Work, whether or not such losses arise from causes beyond the Contractor's control.
- .2 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.8 DOCUMENTS REQUIRED

- .1 Maintain at job site, one copy of each document as follows:
- .1 Select Text from the Limited Remedial Action Plan (Limited RAP)
- .2 Contract Drawings.
- .3 Specifications.
- .4 Addenda and Amendments.
- .5 Reviewed Shop Drawings, Product Data and Samples.
- .6 List of Outstanding Shop Drawings.
- .7 Change Orders.
- .8 Other Modifications to Contract.
- .9 Field Test Reports.
- .10 Copy of Approved Work Schedule.

- .11 Health and Safety Plan and Other Safety Related Documents.
- .12 Ministry of Labour Notice/Permit and Registration of Contractors/Employers on-site.
- .13 TBIAAI FAP.
- .14 TC PCO.
- .15 Nav Canada LUP.
- .16 Other documents as specified.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 MINIMUM STANDARDS

- .1 National Building Code of Canada 2015, National Fire Code of Canada 2015, Ontario Building Code 2019, and any other code of federal, provincial or local application, including all amendments and addenda up to project date, provided that in any case of conflict or discrepancy, the more stringent requirements shall apply as directed by Departmental Representative.
- .2 Rules and regulations of authorities having jurisdiction.
- .3 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter O.1 as amended, Workplace Safety and Insurance Act and municipal statutes and authorities.
- .4 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.
- .5 Canadian Impact Assessment Act.
- .6 Canadian Environmental Protection Act (New Substance Notification Regulations).
- .7 Transportation of Dangerous Goods Act.

1.2 AUTHORITIES HAVING JURISDICTION

- .1 Thunder Bay International Airport Authority Inc.
- .2 PSPC Fire Protection Program is the sole authority having jurisdiction over this project with regards to fire standards.
- .3 Fire Testing requirements are for ULC or WHIMS listed and labelled products.
- .4 Transport Canada.
- .5 Nav Canada.
- .6 Environment Canada.

1.3 TAXES

- .1 Pay applicable Federal, Provincial and Municipal taxes.

1.4 FEES, PERMITS, CERTIFICATES AND LETTERS

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates, permits and letters required.
- .3 Furnish certificates, permits and letters when requested.

1.5 EXAMINATIONS

- .1 Examine existing conditions and determine conditions affecting work at the Site and surrounding areas.
- .2 Notify Departmental Representative in writing of any discrepancies between contract documents and site conditions.

1.6 DOCUMENTS

- .1 Departmental Representative will provide one electronic set of drawings, schedules, and specifications for as-built drawing and specification purposes.
- .2 Keep one copy of contract documents on the Site during Work.

1.7 CONTRACT DRAWINGS

- .1 Submit formal submittals in accordance with Section 01 33 00.
- .2 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as pdf files as directed by Departmental Representative.
- .3 As work progresses, neatly record significant deviations from the Contract drawings and specifications using fine, red marker on full size white prints and specifications. Make the same changes on the electronic files.
- .4 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative and TBIAAI each one set of drawings and specifications marked "AS-BUILT".

1.8 ADDITIONAL DRAWINGS

- .1 Departmental Representative may furnish additional drawings to clarify work.
- .2 Such drawings become part of Contract Documents.

1.9 PROTECTION

- .1 Safe and efficient continuation of airport operations takes priority over the Contractor's operations at all times throughout the contract period.
- .2 Efforts must be employed to minimize impacts to the environment at the Site.
- .3 Protect existing structures on Site.
- .4 Establish location, protect and maintain existing utility lines.
- .5 Maintain existing services in occupied areas.
- .6 Provide required water and electrical services to perform the work at no extra cost to the Departmental Representative.
- .7 Replace damaged existing work with material and finish to match original.

1.10 TEMPORARY FACILITIES AND SERVICES

- .1 Provide and maintain temporary facilities and services required to carry out work.
- .2 Remove temporary facilities and services on completion of work.
- .3 Provide and maintain temperature and enclosure required to prevent frost damage to work as required.

1.11 CUTTING AND REMEDIAL WORK

- .1 Co-ordinate work to keep cutting and remedial work to a minimum.
- .2 Execute cutting and remedial work required. Notify Departmental Representative before cutting, boring or sleeving structural members.
- .3 Use specialists in affected material to execute cutting and remedial work.

1.12 CO-ORDINATION AND CO-OPERATION

- .1 The Site, as defined by the limit of Site on drawing C01, will not be occupied during Work execution.
- .2 Buildings on Site will not be occupied during execution of Work.
- .3 Execute work with minimum disturbance to airport personnel.
- .4 Maintain access and exits.
- .5 Where security has been reduced by work of contract, provide temporary means to maintain security.

1.13 DESIGNATED SUBSTANCES

- .1 The Site is not known to contain materials that would be designated substances referred to in the Occupational Health and Safety Act and Regulations for Construction Projects, O. Reg. 213/91 as amended.

1.14 SCHEDULING

- .1 Submit construction schedule for work in accordance with Section 01 32 16.19.

1.15 SPECIAL PROTECTION AND PRECAUTIONS

- .1 Comply with the requirements of the Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and the provision of safety data sheets.
- .2 Personal Protective Equipment (PPE) measures will be implemented to limit potential contact and exposure to contaminants of concern.

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 ACCESS AND EGRESS

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.
- .2 Comply with posted restrictions. Acquire and submit to Departmental Representative copies of all necessary permits.
- .3 Provide dedicated personnel for access control at entrance gate ("Gate 36") for the entire duration of construction activities.
 - .1 Dedicated personnel will be responsible for:
 - .1 Opening/closing gate for construction traffic.
 - .2 Logging truck numbers, enter/exit dates and times.
- .4 Gate openers will only be issued to a limited number of personnel.

1.2 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises or surrounding community. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Carry out noise generating work Monday to Friday from 7 am to 7 pm.
- .3 Maintain existing services to provide for personnel and vehicle access.
- .4 Where security is reduced by work provide temporary means to maintain security.
 - .1 Submit security plan within 5 days after Award of Contract.
 - .1 Security plan to include temporary measures required to maintain security to satisfaction of Departmental Representative.
- .5 Contractor will provide sanitary facilities for use by Contractor's personnel and Departmental Representative and will be required to keep facilities clean.

1.3 ALTERATIONS, ADDITIONS OR REPAIRS

- .1 Execute work with least possible interference or disturbance to normal use of premises. Arrange with Departmental Representative to facilitate execution of work.
- .2 Damage to the existing Site or surrounding properties will be restored to equal or better site conditions.

1.4 SPECIAL REQUIREMENTS

- .1 Submit schedule in accordance with Section 01 32 16.07.
- .2 Ensure that Contractor personnel employed on-site become familiar with and obey regulations including safety, fire, traffic and security regulations.

- .3 Keep within limits of work area and avenues of ingress and egress.
- .4 Follow half-load restrictions on public and private roads.
- .5 Machinery and equipment will be restricted to the defined work and laydown areas to minimize any impacts to the surrounding areas.
- .6 Machinery and equipment will be cleaned prior to going on-site to avoid the potential introduction of invasive or non-native species to the site and prior to demobilization.
- .7 Maximum height restrictions as indicated are imposed in the area of the work.
- .8 Lightweight items and debris must be secured at all times so that they do not pose a potential hazard for air traffic.

1.5 SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions.
 - .1 Smoking is not allowed on site or along access route inside the access gate.

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

- .1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.
- .2 Prepare agenda for meetings.
- .3 Distribute written notice of each meeting 5 days in advance of meeting date to Departmental Representative.
- .4 Provide physical space and make arrangements for meetings.
- .5 Preside at meetings.
- .6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within 3 days after meetings and transmit to meeting participants and, affected parties not in attendance.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.2 PRECONSTRUCTION MEETING

- .1 Within 7 days after Award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
- .2 Departmental Representative, Contractor, Public Services and Procurement Canada, Transport Canada, Thunder Bay International Airport Authority, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Health and safety in accordance with Section 01 35 29.06.
 - .3 Schedule of Work: in accordance with Section 01 32 16.19.
 - .4 Schedule of submittals.
 - .5 Requirements for facilities in accordance with Section 01 52 00.
 - .6 Site security in accordance with Section 01 56 00.
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

- .8 Record drawings and photographs in accordance with Section 01 33 00.
- .9 Take-over procedures, acceptance, warranties.
- .10 Monthly progress claims, administrative procedures, hold backs.

1.3 PROGRESS MEETINGS

- .1 During course of Work schedule progress meetings at the call of Departmental Representative.
- .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .3 Notify parties minimum 5 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.
- .5 Agenda to include the following:
 - .1 Review and approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Health and Safety issues, including incidents, near misses and corrective measures.
 - .4 Environmental compliance and impact due to changes in weather, site conditions or other requirements.
 - .5 Field observations, problems, conflicts.
 - .6 Problems which impede construction schedule.
 - .7 Review of delivery schedules.
 - .8 Corrective measures and procedures to regain projected schedule.
 - .9 Revision to construction schedule.
 - .10 Progress schedule, during succeeding work period.
 - .11 Review submittal schedules: expedite as required.
 - .12 Maintenance of quality standards.
 - .13 Review proposed changes for effect on construction schedule and on completion date.
 - .14 Other business.

1.4 FINAL INSPECTION MEETING

- .1 After Work is complete, schedule Final Inspection meeting.
- .2 Departmental Representative, Contractor, Public Services and Procurement Canada, Transport Canada, Thunder Bay International Airport Authority, major Subcontractors, field inspectors and supervisors will be in attendance.
- .3 Notify parties minimum 5 days prior to meeting.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

- .5 Contractor's Inspection: conduct inspection of 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's inspection.
- .6 Departmental Representative's Inspection:
 - .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
- .7 Final Inspection:
 - .1 Request final inspection of Work by Departmental Representative.
 - .2 When Work incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

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 DEFINITIONS

- .1 Activity: element of Work performed during course of 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 system.
- .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
- .4 Construction Work Week: The Contractor will use a five (i.e. Monday to Friday, inclusive) day work week and will provide a calendar defining working days as part of Bar (GANTT) Chart submission.
- .5 Duration: number of work periods (not including holidays or other nonworking 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.
- .10 Select Text from Limited RAP: Limited Remedial Action Plan, prepared by Golder Associates Ltd, Dated February 2020, project number 19126451/04.

1.2 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Plan to complete Work in accordance with prescribed milestones and time frame.
- .3 Limit activity durations to maximum of approximately 5 working days, to allow for progress reporting.

- .4 Ensure that it is understood that award of Contract or time of beginning, rate of progress, Certificate of Substantial Performance and Certificate of Completion as defined times of completion are of essence of this contract.

1.3 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Submit to Departmental Representative within 10 working days of award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.
- .3 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

- .1 Project milestones form interim targets for Project Schedule.
 - .1 Hold preconstruction meeting a minimum of 10 working days prior to mobilization to the site.
 - .2 Submit required project submittals a minimum of 10 working days prior to mobilization to the site.
 - .3 Mobilization to the Site within 40 days of contract award.
 - .1 Relevant submittals to be approved by Departmental Representative prior to mobilization.
 - .4 Completion of fuel line decommissioning, removal of water from FTA, and removal of fuselage (Phase 1) within 10 calendar days of mobilization.
 - .5 Completion of removal of solid material to 100 mm above the primary liner (Phase 2) within 15 calendar days of mobilization.
 - .6 Completion of removal of solid material to 100 mm above the secondary liner (Phase 3) within 17 calendar days of mobilization.
 - .7 Completion of removal of the solid material, secondary liner and the 150 mm of sand fill beneath the secondary liner (Phase 4) within 19 calendar days of mobilization.
 - .8 Completion of removal of existing maintenance holes and remaining piping and bedding (Phase 5) within 20 calendar days of mobilization.
 - .9 Completion of reinstatement within 28 calendar days of mobilization.
 - .10 Site demobilization completed and issuance of Certificate of Substantial Performance within 30 calendar days of contractor mobilization to the site.

1.5 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Departmental Representative will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.

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

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as a minimum milestone and activity types as follows:
 - .1 Award.
 - .2 Submittals.
 - .3 Mobilization.
 - .4 Fuel Line Decommissioning.
 - .5 Removal of Standing Water from the FTA.
 - .6 Inspection and Removal of Mock-Up Fuselage.
 - .7 Removal of Water between Primary and Secondary Liners.
 - .8 Excavation above FTA Primary Liner.
 - .9 Excavation of FTA Primary Liner.
 - .10 Excavation of FTA Secondary Liner.
 - .11 Excavation of FTA Manholes.
 - .12 Assist Consultant with Soil Sampling of Native Soil.
 - .13 Reinstatement.
 - .14 Demobilization.

1.7 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.

1.8 PROJECT MEETINGS

- .1 Discuss Project Schedule at 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.

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 SECTIONS

- .1 Section 02 41 99 – Demolition for Minor Works
- .2 Section 02 50 13 – Management of Toxic Waste
- .3 Section 02 61 00.01 – Soil Remediation
- .4 Section 31 23 33.01 – Excavating, Trenching and Backfilling

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 submittal is approved.
- .3 Present submittals and product data 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 co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
- .6 Notify Departmental Representative, in writing at time of submission, identifying any deviations from requirements of Contract Documents stating reasons for deviations.
- .7 Verify field measurements and affected adjacent Work are co-ordinated.
- .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 Keep one reviewed copy of each submission on-site.
- .11 Submit number of hard copies specified for each type and format of submittal and also submit in electronic format as PDF files. Forward PDF, NMSEdit Professional SPP, MS Word, MS Excel, MS Project and Autocad DWG files on USB compatible with PWGSC encryption requirements or through email or alternate file sharing service such as FTP, as directed by Departmental Representative.

1.3 AS-BUILT DRAWINGS AND SPECIFICATIONS

- .1 As work progresses, neatly record significant deviations from the Contract drawings and specifications using fine, red marker on full size white prints and specifications. Make the same changes on the electronic files.
- .2 Neatly print lettering and numbers in size to match original. Lines may be drawn free-hand but shall be neat and accurate. Add at each title block note: "AS BUILT". Circle on Table of Contents each title and number of drawing marked with "AS-BUILT" information. Circle on Table of Contents each specification section number and title of specification sections marked with "AS-BUILT" information.
- .3 Departmental Representative will provide one electronic set of drawings, schedules, and specifications for as-built drawing and specification purposes.
- .4 Record following significant deviations:
 - .1 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
 - .2 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
 - .3 Field changes of dimension.
 - .4 Other significant deviations which are concealed in construction and cannot be identified by visual inspection.
 - .5 Alternative materials and systems installed replacing original materials and systems specified by trade name.
- .5 Submit one paper copy and one electronic copy, of AS-BUILT drawings and specifications to Departmental Representative upon completion of Work.

1.4 CONSTRUCTION PHOTOGRAPHS

- .1 Submit electronic copy of colour digital photography in jpg format, standard resolution upon completion of Work.
- .2 Identification: name and number of project and date of exposure indicated.
- .3 Number of viewpoints and location of viewpoints determined by Departmental Representative.
- .4 Frequency:
 - .1 Before the site construction commences.
 - .2 At completion of each stage of remediation in accordance with Section 02 61 00.01.
 - .3 At final reinstatement.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Ontario Workers Safety and Insurance Board status.

1.6 LIST OF SUBMITTALS

.1 The following table provides a list of the required submittals, the timeframe for submission and the applicable specification Section.

.1 Submittals that are to be provided immediately after award of Contract or within 10 working days of Award of Contract are to be approved by Departmental Representative prior to mobilization.

Submittal	Timeframe for Submission	Section Number
Master Plan.	Within 10 working days of award of Contract.	01 32 16.07
Detailed Construction Schedule.	Within 5 working days of receipt of acceptance of Master Plan.	01 32 16.07
Ontario Workers Safety and Insurance Board Status	Immediately after award of Contract	01 33 00
Notification for Progress Meetings	At least 5 working days prior to progress meetings.	01 35 13.43
Site Layout.	Within 10 working days after award of Contract.	01 35 13.43
Equipment Decontamination Plan.	Prior to commencing construction.	01 35 13.43
Health and Safety Plan.	Within 10 working days after award of Contract.	01 35 29.06
Fuselage Recycling – Handling and Transportation Plan.	30 calendar days prior to site mobilization.	01 35 13.43
Waste Reduction Workplan	Within 15 working days after award of Contract	02 41 99
Records of Contractor's Health and Safety Meetings.	Upon request.	01 35 29.06
Contractor's authorized representative's work site health and safety inspection reports.	Daily.	01 35 29.06
Orders, directions or reports issued by health and safety inspectors.	As applicable.	01 35 29.06
Incident and Accident Reports.	As applicable.	01 35 29.06
Safety Data Sheets.	As applicable.	01 35 29.06 02 50 13

Submittal	Timeframe for Submission	Section Number
Workplace Safety and Insurance Board (WSIB) - Experience Rating Report.	Within 5 working days after award of Contract.	01 35 29.06
Environmental Protection Plan.	Within 10 working days of award of Contract.	01 35 43 01 35 13.43
Field drawings to indicate relative position of various services and equipment.	As requested.	01 71 00
Detailed Work Plan.	Within 10 working days of award of Contract.	02 61 00.01
Closeout Submittals: <ul style="list-style-type: none"> • Weigh scale tickets. • Contractor's daily log of site activities. • Summary Report. • Final Survey 	Upon completion of work and prior to final completion site inspection.	02 61 00.01 01 78 00
Shipping Documents and Waste Manifests for Toxic Wastes	After transportation of material off-site	02 50 13
Records of Underground Utility Locates.	Prior to commencement of work.	02 61 00.01 31 23 33.01
Written notice	At least 7 days prior to excavation work When bottom of excavation is reached	31 23 33.01
Construction equipment list	Prior to commencement of work.	31 23 33.01
Pre-Excavation Survey	At least 5 days prior to the start of excavation	31 23 33.01
Completed Excavation Survey	Within 10 working days of completion of excavation	31 23 33.01
Waste Reduction Workplan	Prior to transportation of construction/demolition waste off-site	01 74 20
Shipping Documents and Waste Manifests for Construction/Demolition Waste	After transportation of construction/demolition waste off-site	01 74 20

Submittal	Timeframe for Submission	Section Number
Proof of fill compliance with MECP Table 1	Prior to transporting material to Site.	31 23 33.01
As-Built Drawings and Specifications	Upon completion of work.	01 33 00
Construction Photographs	Prior to commencement of work, upon completion of each stage of remediation, and upon completion of work.	01 33 00 02 61 11.01
Qualifications	Within 10 working days of contract award.	02 61 00.01

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 GENERAL PROTECTION

- .1 Do not disrupt airport business except as permitted by the Departmental Representative.
- .2 Adhere to all TBIAAI procedures for contractors working on airport premises.
- .3 Provide temporary protection for safe handling of public, personnel and vehicular traffic in accordance with Section 01 56 00.
- .4 Provide barricades and lights where directed by Departmental Representative.

1.2 MOVEMENT OF EQUIPMENT AND PERSONNEL

- .1 Notify Departmental Representative if work is required outside of the limits of Site, as defined in Section 01 11 00 and as indicated.
- .2 Notify Departmental Representative if work is required in areas of the airport not closed to aircraft traffic.
 - .1 In areas of airport not closed to aircraft traffic:
 - .1 Obtain the Departmental Representative's approval on scheduling of Work.
 - .2 Control movements of equipment and personnel as directed by the Departmental Representative.
 - .3 Provide qualified field personnel at locations designated by the Departmental Representative to relay signals from airport traffic control tower to equipment and personnel wishing to cross live traffic areas.
 - .4 Obey signals from airport traffic control tower instantly.

1.3 UNSERVICEABLE AREAS

- .1 Open flames and inflammable fuels are not permitted.
- .2 Park equipment not in use and stockpile materials so that stockpile tops are below maximum height restrictions as indicated.

1.4 AIRPORT FACILITIES

- .1 Notify Departmental Representative if work is required outside of the limits of Site, as defined in Section 01 11 00 and as indicated, sufficiently in advance of operations so that underground facilities can be located.

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 Transportation and Dangerous Goods Act (1999).
- .2 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.
 - .1 Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, 1999, updated 2001, 2002, 2003, 2004, 2005, 2006 and 2007.
- .3 Ontario Environmental Protection Act, R.S.O. 1990, c. E. 19
 - .1 O.Reg. 347/90 as amended.
 - .2 O.Reg. 153/04 as amended.

1.2 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00.
- .2 Submit, prior to start of work, plan detailing management of hazardous wastes including name of licensed hauler and proof of acceptance at licensed facility.
- .3 Submittals for Progress Meetings: make submittals at least 3 working days 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 daily.
 - .3 Other information required by Departmental Representative or relevant to agenda for upcoming progress meeting.
 - .4 Weekly copies of Site entry and work area logbooks with information on worker and visitor access.
 - .5 Other information required by Departmental Representative or relevant to agenda for upcoming progress meeting.
- .4 Site Layout: within 10 working days after date of Award of Contract and prior to mobilization to site, submit site layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor including following:
 - .1 Means of ingress and egress.
 - .1 Truck and vehicle routes, entrances, and exits to the Site are to be identified and documented prior to initiation of construction work on-Site
 - .2 Equipment decontamination area (if required).
 - .3 Equipment and material staging areas.

- .4 Roll-off container areas. Locations shall be placed away from other environmentally sensitive 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.
- .5 Environmental Protection Plan:
 - .1 Coordinate with requirements of Section 01 35 43.
 - .2 Plan to include minimizing the potential spread of PFAS contamination from the FTA and the areas surrounding the FTA by one of the two processes listed below:
 - .1 Construct Equipment Decontamination Pad. Submit equipment decontamination pad design to Departmental Representative for review prior to commencing construction.
 - .1 Wastewater from the Equipment Decontamination Pad must be collected and placed directly into covered watertight containers for hazardous waste transport and off-site incineration.
 - .1 The cost for transportation and incineration of this wastewater will not be measured separately for payment. All costs to be borne by the Contractor. The wastewater from the Equipment Decontamination Pad must be handled separately from the dewatering of the FTA facility.
 - .2 Importation of granular fill and diligent maintenance of the site access route (as indicated) within the area of known soil impacts such that vehicles are not in direct contact with impacted soil.
 - .1 Work in a manner that minimizes the amount of impacted soil on the access route and immediately clean impacted soil identified on roadways in order to minimize the potential spread of contamination across the site or off-site, as per the Environmental Protection Plan.
 - .2 Upon completion of remedial activities, excess granular fill imported to site that is placed in the area of known soil impacts must be:
 - .1 Graded to ensure that runoff is directed away from the area of the FTA and left in place. If the grade is raised as a result of this process, monitoring wells will be extended in accordance with Ontario Regulation 903 such that they will be accessible when the casings are installed to be flush with the ground surface.
 - .1 Any monitoring wells which require extension will have the top of pipe elevation surveyed before and after the extension is added.

- .2 The cost for supply, transportation, placement, grading of this granular material and well extension will not be measured separately for payment. All costs to be borne by the Contractor.
- .6 Fuselage Recycling – Handling and Transportation Plan: 30 days prior to site mobilization, submit plan outlining the handling and transportation of the fuselage, including:
 - .1 PPE measures to be implemented during handling, transport, storage and melting of the fuselage.
 - .1 PPE measures to be suitable for exposure to contaminants suspected to be present on the fuselage, in accordance with Section 01 35 29.
 - .2 The temperature at which the melting of the fuselage will occur, ensuring it exceeds 1000 °C for destruction of PFAS.
 - .3 Air emission controls implemented at the steel recycling facility.
 - .4 Storage conditions for the fuselage during transport and while at the steel recycling facility.
 - .1 Prevent exposure to rain and other elements to reduce generation of leachate.
 - .5 A timeline for melting of the fuselage.
 - .6 The steel recyclers written agreement to implement the plan as outlined.

1.3 REGULATORY REQUIREMENTS

- .1 Provide erosion and sediment control around the laydown and excavation areas and in accordance with federal, provincial, and local regulations.
- .2 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.
- .3 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.
 - .1 Contractor: responsible for complying with amendments as they become effective.
- .4 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify Departmental Representative immediately.

1.4 SEQUENCING AND SCHEDULING

- .1 Do not commence Work involving contact with potentially contaminated materials until decontamination facilities are operational and approved by Departmental Representative.

1.5 CONTAMINATED SOIL STORAGE FACILITIES

- .1 Provide, maintain, and operate temporary storage facilities as required. Excavated contaminated solid materials, including soil, sludge and piping, is to be placed directly into containers in accordance with Section 02 61 00.01.
- .2 Stockpiling of uncontained contaminated solid material on site is not permitted.

1.6 WASTEWATER STORAGE TANK

- .1 Provide, operate, and maintain wastewater storage tanks to store wastewaters.
- .2 Wastewater includes water collected from the FTA and Equipment Decontamination Pad (if implemented), each of which shall be handled separately.
- .3 Discharges: do not discharge to site sewer systems or waterways.
- .4 Provide pumps and piping to convey collected wastewaters to designated wastewater storage tanks.
- .5 Install wastewater storage tanks in locations as directed by Departmental Representative.
- .6 Support tanks on temporary aboveground foundations.
- .7 Connect pumps, piping, valves, miscellaneous items, and necessary utilities as required for operation of facilities; and protect tanks, valves, pumps, piping, and miscellaneous items from freezing.
- .8 Do not operate wastewater storage tanks until inspected and approved by Departmental Representative.
- .9 Notify Departmental Representative 72 hours minimum in advance of when wastewater storage tank is anticipated to be full.
- .10 Transport and dispose of wastewaters for incineration off-site as identified by Contractor and approved by Departmental Representative.

1.7 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 as determined necessary by Departmental Representative during construction and in accordance with Province of Ontario regulations.
- .3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for water misting system for dust and particulate control.
 - .1 Within the area of known soil impacts the volume of water used must be minimized and cannot be applied such that runoff is present.
- .4 Use chemical means for water misting system for dust and particulate control only with Departmental Representative's prior written approval.
- .5 As minimum, use appropriate covers on trucks hauling fine or dusty solid materials. Use watertight vehicles to haul solid materials with free water.
- .6 Prevent dust from spreading to adjacent property sites.
- .7 Departmental Representative will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.

- .8 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

1.8 EQUIPMENT DECONTAMINATION

- .1 Prior to commencing work involving equipment contact with potentially contaminated materials provide a decontamination plan.
 - .1 Decontamination plan to include methods of decontamination for largest piece of on-site potentially contaminated equipment.
- .2 Decontaminate equipment prior to arriving at site to initiate work. Ensure equipment is free of contaminants and invasive species.
- .3 Decontaminate equipment (or part thereof, such as the bucket on a backhoe if only that has come into contact with potentially contaminated materials) prior to subsequent work or travel on clean areas in accordance with equipment decontamination plan that has been approved by the Departmental Representative.
- .4 At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated. Use water or steam supplemented by detergents as appropriate to clean the bucket.
- .5 Maintain inspection record on Site which includes equipment descriptions with identification numbers or license plates; time and date decontamination completed; name of inspector with comment stating that decontamination was performed and completed.
- .6 Each piece of equipment will be inspected by Departmental Representative after decontamination and prior to removal from site and/or travel on clean areas. Departmental Representative will have right to require additional decontamination to be completed if deemed necessary.
- .7 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens as required.
- .8 Collect decontamination waste and wash water. Transfer waste to watertight containers for hazardous waste transport and off-site incineration (water) or disposal as hazardous waste (solids).
- .9 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection and face shields.

1.9 WATER CONTROL

- .1 Maintain excavations free of water.
- .2 The groundwater at the Site is expected to be below the bases of the excavation areas, as such, no groundwater management would be expected during the remedial excavation.

- .1 Prevent accumulation of precipitation in the excavation as per Section 01 11 00.
- .3 Prevent surface water runoff from leaving work areas. During all stages of remediation and site construction, employ erosion and sediment control measures to limit the amount of impacted runoff escaping from the Site. The contractor should take all necessary steps to control and prevent any degradation of storm water runoff from the Site. These measures may include placement of weighted down fibre rolls around the work area. Consideration shall be given to storm water runoff management for after work periods and on weekends.
- .4 Do not discharge surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers.
- .5 Collect and dispose of wastewater from sanitary facilities off-site.
- .6 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.
- .7 Control surface drainage, runoff from unstabilized areas is intercepted and diverted to suitable outlets.
- .8 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.
- .9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.

1.10 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.

1.11 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.

1.12 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 on-site.

- .4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner into streams, waterways, storm or sanitary drains.
- .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 Debris including excess construction material.
 - .2 Non-contaminated litter and rubbish.
 - .3 Disposable PPE worn during final cleaning.
 - .4 Wastewater from sanitary facilities.
 - .5 Wastewater generated from final decontamination operations.
- .7 Dispose of materials in accordance with Section 01 35 43.
- .8 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.
- .9 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:
 - .1 Hazardous wastes recycled in manner constituting disposal.

1.13 RECORD KEEPING

- .1 Maintain adequate records to support information provided to Departmental Representative regarding exception reports, annual reports, and biennial reports.
- .2 Maintain bills of lading for minimum 375 days from date of shipment 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 Province of Ontario
 - .1 Occupational Health and Safety Act, R.S.O., 2004.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
 - .4 O.Reg. 490/09, Designated Substances
- .2 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .4 Canadian Standards Association (CSA).
 - .1 CSA S350-M1980 (R2003), Code of Practice for Safety in Demolition of Structures.
- .5 National Building Code (NBC), 2015.
 - .1 NBC 2015, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
- .6 National Fire Code (NFC), 2015.
 - .1 NFC 2015, Division B, Part 5 Hazardous Processes and Operations, Subsection 5.6.13 Fire Safety Plan.
- .7 Treasury Board of Canada Secretariat (TBS).
 - .1 Treasury Board, Fire Protection Standard, April 1, 2010.

1.2 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Submit site-specific Health and Safety Plan: Within 10 working days after Award of Contract and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in Work Plan.
 - .3 Develop checklist for items to be inspected on a daily basis. Document actions taken.
 - .4 Names of personnel and alternates responsible for site safety and health.
 - .1 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.
- .3 Health and Safety training records for all personnel accessing the site.
- .5 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 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 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 wildlife.
- .3 Provide Fire Safety Plan, specific to work location in accordance with NBC, Division B, Article 8.1.1.1.3 prior to commencement of work. Deliver two copies of the Fire safety Plan to the Departmental Representative within 10 days of award of contract and before mobilizing to the site.
- .4 Contractor's and Sub-contractors' Safety Communication Plan. Coordinate plan with existing requirements and procedures provided by Departmental Representative and the TBIAAI.

- .5 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing emergency response requirements and procedures provided by Departmental Representative and the TBIAAI.
 - .1 Refer to YQT Airport Construction and Contractor Safety.
- .6 Submit electronic copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
- .7 Submit electronic copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.
- .8 Submit electronic copies of incident and accident reports.
- .9 Submit WHMIS SDS - Safety Data Sheets.
- .10 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 working days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 3 working days after receipt of comments from Departmental Representative.
- .11 Departmental Representative's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.
- .12 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative.
- .13 Submit names of personnel and alternates responsible for site health and safety.
- .14 Submit records of Contractor's health and safety meetings when requested.
- .15 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.
 - .1 Follow special procedures in accordance with Section 01 35 13.13.
 - .2 Address standard operating procedures specific to the project site to be implemented during emergency situations. Coordinate plan with existing emergency response requirements and procedures provided by Departmental Representative and the TBIAA.

1.3 FILING OF NOTICE

- .1 File Notice of Project with Provincial authorities prior to beginning of Work.

1.4 SAFETY ASSESSMENT

- .1 Perform site specific safety hazard assessment related to project.

1.5 MEETINGS

- .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.

1.6 REGULATORY REQUIREMENTS

- .1 Do Work in accordance with Section 01 41 00.

1.7 PROJECT/SITE CONDITIONS

- .1 Work at site will involve contact with soil, solid materials and water contaminated with per- and polyfluoroalkyl substances (PFAS) and petroleum hydrocarbons. In order to limit potential risks associated with exposure to these contaminants, the following items must be included in the health and safety plan:
 - .1 Wear appropriate PPE including disposable gloves, safety glasses, long sleeve clothing, and coveralls to limit potential risk associated with direct contact of contaminants;
 - .2 When working either within 10 m, or downwind, of contaminated material being disturbed, wearing of a National Institute for Occupational Safety and Health (NIOSH) approved half-mask air-purifying respirator with P100 high-efficiency particulate air (HEPA) filters to limit potential risks associated with inhalation of contaminants; and,
 - .3 Hand washing procedures to minimize potential risks associated with ingestion of contaminants.

1.8 GENERAL REQUIREMENTS

- .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
- .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns either accepting or rejecting improvements.
- .3 Relief from or substitution for any portion or provision of minimum Health and Safety standards specified herein or reviewed site-specific Health and Safety Plan shall be submitted to Departmental Representative in writing.

1.9 RESPONSIBILITY

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to 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, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .3 Where applicable the Contractor shall be designated "Constructor", as defined by Occupational Health and Safety Act and Regulations for Construction Projects for the Province of Ontario.

1.10 COMPLIANCE REQUIREMENTS

- .1 Comply with Ontario Health and Safety Act, R.S.O. 2004
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN HAZARDS

- .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Ontario having jurisdiction and advise Departmental Representative verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
 - .1 Have site-related working experience specific to activities associated with environmental remediation projects.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
 - .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.13 POSTING OF DOCUMENTS

- .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.
 - .1 Contractor's Safety Policy.
 - .2 Constructor's name.
 - .3 Notice of Project.
 - .4 Name, trade, and employer of Health and Safety Representative.
 - .5 Ministry of Labour Orders and Reports.
 - .6 Occupational Health and Safety Act and Regulations for Construction Projects for Province of Ontario.
 - .7 Address and phone number of nearest Ministry of Labour Office.
 - .8 Material and Safety Data Sheets.
 - .9 Written Emergency Response Plan.
 - .10 Site Specific Safety Plan.
 - .11 Valid Certificate of First Aider on Duty.
 - .12 WSIB "In Case of Injury at Work" poster.
 - .13 Location of toilet and cleanup facilities.

1.14 CORRECTION OF NON-COMPLIANCE

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
- .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

- .1 Blasting or other use of explosives is not permitted.

1.16 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 Coordinator to stop or start Work when, at Health and Safety Coordinator's discretion, it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

1.17 PERSONNEL HEALTH, SAFETY, AND HYGIENE

- .1 Training: ensure personnel entering site are trained in accordance with specified personnel training requirements.
- .2 Levels of Protection: establish levels of protection for each Work area based on planned activity and location of activity. Minimum PPE required as follows:
 - .1 Level C:
 - .1 Head, Eye, Ear Protection: hard hat, safety glasses with side shields, ear muffs or plugs.
 - .2 Hand Protection: gloves.
 - .3 Foot Protection: safety shoes.
 - .4 Clothing: long sleeve shirt and coveralls.
 - .2 If working in an area with limited air exchange a respirator must be worn in addition to Level C protection.
 - .1 Respirator: National Institute for Occupational Safety and Health (NIOSH) approved half-mask air-purifying respirator with P100 high-efficiency particulate air (HEPA) filters.
- .3 Personal Protective Equipment:
 - .1 Furnish site personnel with appropriate PPE as specified above. Ensure that safety equipment and protective clothing is kept clean and maintained.
 - .2 Disposable gloves to be worn for manual handling of contaminated soil or material.

- .4 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 and do not permit contact lenses on-site within work zones.
 - .2 Ensure footwear is steel-toed safety shoes or boots.
 - .3 Dispose of or decontaminate PPE worn on-site at end of each workday.
 - .4 Decontaminate reusable PPE before reissuing.
- .5 Heat Stress: implement heat stress monitoring program as applicable and include in site-specific Health and Safety Plan.
- .6 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.
 - .3 Handwashing station. All personnel are to wash their hands thoroughly with soap and water before eating or smoking.
- .7 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, in accordance with applicable regulations.

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 Definitions:
 - .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably 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.
- .2 Canada Fisheries Act
- .3 O.Reg. 347, General – Waste Management
- .4 Ontario Provincial Standard Drawings (OPSD):
 - .1 OPSD 219.110 (November 2015) – Light-Duty Silt Fence Barrier, November 2015.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review by Departmental Representative.
- .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 Descriptions of plan to minimize the potential spread of PFAS contamination across the site or off-site in accordance with Section 01 35 13.43.

- .6 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
- .7 Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on-site.
- .8 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather.
 - .1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles and runoff.
- .9 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.
- .10 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
- .11 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
- .12 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
- .13 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.
- .14 Storm Water Management Plan identifying methods and procedures for management and/or discharge of runoff which is directly derived from construction activities.
- .15 Historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for protecting historical, archaeological, cultural resources, biological resources and wetlands and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.
 - .1 Include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.
 - .2 Include provision for temporary suspension of work activities in case of any relevant historical, archaeological or cultural finding, as determined by the Departmental Representative.

1.3 FIRES

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

1.4 DISPOSAL OF WASTES

- .1 Do not bury rubbish and waste materials on site unless approved by Departmental Representative.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Do not discharge wastes into streams or water ways.
- .4 Separate and dispose of accumulated waste materials off-site in accordance with O.Reg. 347 General Waste Management, to MECP approved disposal facilities or as approved by Departmental Representative or approved transfer stations, including, but not limited to, the following:
 - .1 Debris including excess construction material.
 - .2 Non-contaminated litter and rubbish.
 - .3 Disposable PPE worn during remediation work.
- .5 Appropriate procedures shall be implemented for handling, temporary storage, transport and disposal of impacted soils during all phases of the project. Off-site disposal will be by licensed haulers to a provincially licensed hazardous waste facility.
 - .1 Ontario: Refer to Land Disposal Restrictions in O.Reg. 347 - General Waste Disposal under Ontario EPA and MECP Fact Sheet "Summary of Land Disposal Restrictions, Treatment and Notification Requirements for Waste Generators".
 - .2 Other province/territory of Canada: Follow all applicable regulations for handling, temporary storage, transport and disposal of impacted soils.
- .6 Disposal/recycling of other waste generated during the project shall be done in compliance with Ontario Waste Regulations and the facilities used will be approved by the Departmental Representative.

1.5 VEHICLES/EQUIPMENT

- .1 Maintenance and Use:
 - .1 Prevent contamination of access roads. Immediately scrape up debris or material which is suspected to be contaminated as determined by Departmental Representative; transport and place into designated area approved by Departmental Representative. Inspect and clean access roads at least once per shift.
 - .2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost.
- .2 Vehicles/equipment shall be in good working order and not be leaking any fuel or fluids.
- .3 Restrict access of vehicles from creek banks to protect slope stability.
- .4 Refuelling of vehicles and equipment shall not be conducted near water bodies.
- .5 Traffic management measures (such as 'flag man') shall be implemented if required at site access points to direct traffic or for security purposes.

1.6 DRAINAGE

- .1 Do not allow water containing suspended materials to enter into waterways, sewer or drainage systems.
- .2 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
- .4 Do not direct water flow in a manner which would cause erosion to existing areas.

1.7 SURFACE WATER AND GROUNDWATER QUALITY

- .1 Materials and equipment shall be operated and stored in a manner that prevents deleterious substances (e.g., petroleum products, silt, etc.) as defined by the Fisheries Act from entering surface water.
- .2 The groundwater at the Site is expected to be below the base of the excavation areas and as such, no groundwater management would be expected during the remedial excavation.

1.8 SITE CLEARING AND PLANT PROTECTION

- .1 Minimize clearing of vegetation to only those areas necessary for construction and operation.

1.9 VEGETATION

- .1 Protect vegetation that does not have to be removed by fencing/delineating construction working and/or storage areas.
- .2 Operate construction machinery in a manner that minimizes damage to adjacent vegetation.

1.10 WORK ADJACENT TO WATERWAYS

- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 Do not skid logs or construction materials across waterways.
- .5 Do not use water from waterways.
- .6 Special care shall be exercised while working near water's edge including site-specific erosion and sediment control measures.

1.11 POLLUTION CONTROL

- .1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.
- .2 Protect the site from sedimentation until the excavation has been closed.
- .3 Be prepared to intercept, clean up, and dispose of spills or releases 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 environment in accordance with Environmental Protection Plan and applicable regulations to:
 - .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .1 Ontario Ministry of Environment, Conservation and Parks, Spills Action Centre must be notified by law at 1-800-268-6060.
 - .2 Owner of pollutant, if known.
 - .3 Person having control over pollutant, if known.
 - .4 Departmental Representative.
- .5 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action. Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613)-996-6666 (collect).
- .6 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.
- .7 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials: compatible with type of material being handled.
- .8 Maintain temporary erosion and pollution control features installed under this contract.
- .9 Vehicles and equipment must be maintained in good working condition, equipped with emission controls as applicable to local authorities' emission requirements.
- .10 Control emissions from equipment to local authorities' emission requirements.
- .11 Ensure hazardous substances (including fuel) are stored, handled and applied in a manner to prevent release to the environment and in a legal manner in accordance with hazardous waste regulations.
- .12 Secure all materials at non-productive times (night and shut-down).
- .13 Vehicles shall be shut off when not in use. No vehicle idling on-site.

- .14 Store hazardous or toxic substances in a designated area.
- .15 Comply with requirements of WHMIS regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of SDS.
- .16 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.12 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. Strip vegetation, regrade, or otherwise develop to minimize erosion. 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 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.
- .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 required.
 - .1 At a minimum, provide a light-duty silt fence barrier as per OPSD 219.110 around the north and eastern extents of the laydown area and access road in the area of known soil impacts.
 - .2 Leave silt fence barrier in place and maintain until vegetation is established.
 - .2 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.
 - .3 Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.
 - .4 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, planting, 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.

- .5 Unless Departmental Representative directs otherwise, remove temporary erosion and sediment control devices upon completion of Work. Dispose of accumulated sediments and shape area to permit natural drainage to satisfaction of Departmental Representative. Materials once removed become property of Contractor. Restore or stabilize areas disturbed during removal.
- .6 Do not disturb existing embankments or embankment protection.
- .7 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures. If soil and debris from site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where in Departmental Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.13 SPILLS OR RELEASE OF DELETERIOUS SUBSTANCES

- .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
- .2 All workers shall be fully aware of the spill prevention and response procedures including notification of Departmental Representative.
- .3 Promptly report spills and releases potentially causing damage to environment in accordance with Environmental Protection Plan and applicable regulations to:
 - .1 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
 - .1 Ontario Ministry of the Environment, Conservation and Parks, Spills Action Centre must be notified by law at 1-800-268-6060.
 - .2 Owner of pollutant, if known.
 - .3 Person having control over pollutant, if known.
 - .4 Departmental Representative.
- .4 Further information on dangerous goods emergency cleanup and precautions including a list of companies performing this work can be obtained from the Transport Canada 24-hour number (613) 996-6666 collect.
- .5 Spill kits will be kept on-site during all project phases.
- .6 Contractor shall take due care to ensure no deleterious materials including sediment-laden runoff leave the worksite, or enter any: surface water, storm water, or sanitary sewers at or near the worksite.
- .7 Equipment fuelling or lubricating shall occur in a designated area with proper controls to prevent the release to the ground of deleterious substances, and shall be conducted away from any surface water drains or collection points.
- .8 Any equipment remaining on site overnight shall have appropriately placed drip pans.
- .9 Protect the roadways from tracking of mud, soil, and debris throughout the work.

- .10 Prevent discharges containing waste materials from reaching storm drains or the marine environment. This includes, but is not limited to:

- .1 Protection of drainage structures with filter fences if required.

1.14 NOISE CONTROL

- .1 All construction equipment shall be operated with exhaust systems in good repair to minimize noise.
- .2 Construction activities that could create excessive noise shall be restricted to daylight hours and adhere to the municipal noise by-law.
- .3 If work is to be undertaken outside the specified period in the local noise by-law, then approval for an exemption to the by-law shall be obtained by the Contractor from the municipality.
- .4 Ensure that noise control devices (i.e. mufflers, silencers) on construction equipment are properly maintained.

1.15 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, Contract Documents and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Do not take action until after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.16 SPECIES AT RISK

- .1 Should a species or its critical habitat be encountered, the Contractor should stop work and contact Departmental Representative for direction.

1.17 FISH/ FISH HABITAT

- .1 All materials and equipment used will be operated and stored in a manner that prevents any deleterious substance (e.g., petroleum products, silt, etc.) as defined by the Fisheries Act from entering the surface water.

Part 2 Products

2.1 NOT USED

- .1 Not Used.

Part 3 Execution

3.1 CLEANING

- .1 Clean in accordance with Section 01 74 00.
- .2 Waste Management: separate waste materials for reuse and recycling.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

Part 1 General

1.1 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 ACCESS TO WORK

- .1 Assist Departmental Representative for access to the work and in the collection of samples from the excavation areas.
- .2 Co-operate to provide reasonable facilities for such access.

1.3 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 The Departmental Representative will be collecting and submitting samples from base of excavated areas for testing, as specifically requested in specifications. Assist Departmental Representative with access to the work and in the collection of samples from the excavation areas.

1.4 REJECTED WORK

- .1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.
- .3 If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, difference in value between Work performed and that called for by Contract Documents will be deducted from Contract Amount, amount of which will be determined by Departmental Representative.

1.5 REPORTS

- .1 Submit electronic copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested.

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 INSTALLATION AND REMOVAL

- .1 Provide temporary utilities controls in order to execute work expeditiously.
 - .1 Departmental Representative may issue order to stop work based on the Contractor's non-compliance with any requirements listed in this Section.
- .2 Remove from site all such work after use.

1.2 WATER SUPPLY

- .1 Provide potable water for construction use.

1.3 TEMPORARY POWER AND LIGHT

- .1 Provide and pay for temporary power during construction.
- .2 Confirm generator compliance with the Ministry of the Environment, Conservation and Parks (MECP) regulatory requirements.
- .3 Operate generators in accordance with the manufacturer's instructions and in accordance with all Electrical Safety Authority (ESA) requirements, as applicable.

1.4 TEMPORARY COMMUNICATION FACILITIES

- .1 Provide and pay for temporary telephone lines or cellular phones if there is mobile signal, necessary for own use and use of Departmental Representative.

1.5 FIRE PROTECTION

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted.

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 INSTALLATION AND REMOVAL

- .1 Prepare site plan indicating proposed location and dimensions of work area to be used by Contractor and avenues of ingress/egress.
 - .1 Include details of fence/barrier installation and location of fence/barrier surrounding work area.
- .2 Provide construction facilities in order to execute work expeditiously.
- .3 Remove from site all such work after use.

1.2 HOISTING

- .1 Provide, operate and maintain hoists or cranes required for moving of materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists or cranes to be operated by qualified operator.
- .3 Maximum height restrictions as indicated are imposed in the area of the work.

1.3 SITE STORAGE/LOADING

- .1 Confine work and operations of employees to areas defined by Contract Documents. Do not unreasonably encumber premises with products and materials.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.
- .3 Coordinate with Departmental Representative for location and set up of loading and offloading areas.

1.4 CONSTRUCTION PARKING

- .1 Permission to temporarily store equipment brought to the site will be arranged by Departmental Representative.
 - .1 Store equipment in designated location.
 - .2 Do not disrupt performance of Work or site operations with equipment.
- .2 Provide and maintain adequate access to project site and provide snow removal during period of work.

1.5 OFFICES

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors to not provide their own offices.

- .4 Departmental Representative's Site office.
 - .1 Provide temporary office for Departmental Representative.
 - .2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 4 50% opening windows and one lockable door.
 - .3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.
 - .4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.
 - .5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10 % upward light component.
 - .6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.
 - .7 Equip office with 1 x 2 m table, 4 chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack and one coat rack and shelf.
 - .8 Maintain in clean condition.

1.6 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.
- .2 Locate materials not required to be stored in weatherproof sheds on-site in manner to cause least interference with work activities.

1.7 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force and Departmental Representative 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 Clean and service sanitary facilities at least once per week and dispose of wastewater off-site.

1.8 CONSTRUCTION SIGNAGE

- .1 No other signs or advertisements, other than warning signs, are permitted on-site.
- .2 Signs and notices for safety and instruction shall be in both official languages. Graphic symbols in accordance with applicable regulations.
- .3 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 Departmental Representative.
- .4 Signage, temporary fencing and barriers to be provided to adequately delineate the construction working areas to prevent inadvertent trespass onto the site by third parties.

1.9 ACCESS

- .1 Provide and maintain adequate access to project site. Comply with weight and width limitations on access roads and bridges.
- .2 Clean access areas where used by Contractor's equipment.

1.10 PROTECTION AND MAINTENANCE OF TRANSPORTATION

- .1 Provide access as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including provision of watchpersons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs
- .4 Protect travelling public from damage to person and property.
- .5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor is responsible for repair of damage to roads caused by construction operations.
- .7 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.
- .8 Lighting: to assure full and clear visibility for full width of haul roads and work areas during night work operations.
- .9 Dust control: adequate to ensure safe operation at all times.
- .10 Provide snow removal during period of Work, as necessary.

1.11 CLEAN-UP

- .1 Clean in accordance with Section 01 74 00.
- .2 Reinststate portions of site used for construction facilities, or disturbed during Work, to equal or better than existing conditions.
- .3 Remove construction debris, waste materials, packaging material from work site daily.
- .4 Clean dirt or mud tracked onto roadways.

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 INSTALLATION AND REMOVAL

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.2 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations.
- .2 Provide as required by governing authorities.

1.3 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.

1.4 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.

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 QUALIFICATIONS OF SURVEYOR

- .1 Qualified registered land surveyor, licensed to practice in Place of Work.

1.2 SURVEY REFERENCE POINTS

- .1 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .2 Make no changes or relocations without prior written notice to Departmental Representative.
- .3 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .4 Require surveyor to replace control points in accordance with original survey control.

1.3 EXISTING SERVICES

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.

1.4 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 On completion of excavation, 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 SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by Surveyor certifying those elevations and locations of completed Work that conform with Contract Documents.

1.6 INSPECTIONS

- .1 Provide means of access to permit Departmental Representative, TBIAAI or their duly appointed inspector to do inspections of the Work at all times.

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 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Departmental Representative or other Contractors.
 - .1 Provide wildlife proof garbage containers.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on-site.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Clear snow and ice from access, bank/pile snow in areas designated by the Departmental Representative.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling.
- .7 Dispose of waste materials and debris off-site.
- .8 Store volatile waste in sealed, water-tight metal containers and remove from premises at end of each working day.

1.2 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others and leave Work clean.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris including that caused by Departmental Representative or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on-site.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

1.3 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.

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 CONSTRUCTION & DEMOLITION WASTE

- .1 Carefully deconstruct and source separate materials/equipment and divert from D&C waste destined for landfill to maximum extent possible. Recycle steel that can be sufficiently cleaned via mechanical means without the use a liquid solution. Recycling must be conducted in the same manner as the fuselage (i.e., melted by a steel recycler). Obtain Departmental Representative agreement prior to removal of material for recycling.
- .2 Submit a waste reduction workplan indicating:
 - .1 Descriptions of and anticipated quantities in percentages of materials to be recycled, disposed as hazardous waste and/or incinerated.
 - .2 Schedule of selective demolition of mock-up fuselage and fuel lines.
 - .3 Number and location of containers.
 - .4 Anticipated frequency of tippage.
 - .5 Name and address of recycling, waste, and incineration facilities.
 - .6 How material being removed from the site will be recycled.
- .3 Submit proof that all waste is being disposed of at a licensed landfill site or waste transfer site. A copy of the disposal/waste transfer site's license and a letter verifying that said landfill site will accept the waste must be supplied to Departmental Representative prior to removal of waste from site.

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 Acceptance of Work Procedures:
 - .1 Contractor's Inspection: Contractor: conduct inspection of 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's inspection.
 - .2 Departmental Representative's 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 When Work incomplete according to Owner and Departmental Representative, complete outstanding items and request re-inspection.

1.2 FINAL CLEANING

- .1 Clean in accordance with Section 01 74 00.
 - .1 Remove surplus materials, excess materials, rubbish, tools and equipment.
- .2 Waste Management: separate waste materials for reuse and recycling.

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 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Upon completion of Work and prior to final completion site inspection, submit to the Departmental Representative, electronic copies of the following:
 - .1 Written proof (weigh scale tickets) that all contaminated material has been sent to centre authorized by Ministry of the Environment, Conservation and Parks (MECP) for Province of Ontario, or other facility for recycling or incineration as approved by the Departmental Representative, for acceptance of that type of waste.
 - .2 Construction photographs.
 - .3 Contractor's daily log of site activities.
 - .4 Contactor's Closeout Summary Report.
 - .1 Include all activities completed during course of work.
- .3 Provide evidence, if requested, for type, source and quality of products supplied.

1.2 AS-BUILTS AND SAMPLES

- .1 In additional to the requirements in General Conditions, maintain at the site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Amendments and addenda.
 - .4 Change Orders and other modifications to the Contract.
 - .5 Review shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

- .6 Turn one set, paper copy and electronic copy, of AS-BUILT drawings and specifications over to each TBIAAI and Departmental Representative on completion of work. Submit files on USB compatible with PSPC encryption requirements or through email or alternate electronic file sharing service such as ftp, as directed by Departmental Representative.
- .7 If project is completed without significant deviations from Contract drawings and specifications submit to Departmental Representative one set of drawings and specifications marked "AS-BUILT".

1.3 RECORDING ACTUAL SITE CONDITIONS

- .1 Record information on set of black line opaque drawings provided by Departmental Representative.
- .2 Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: legibly mark each item to record actual construction, including:
 - .1 Measured depths of elements of foundation in relation to finish first floor datum.
 - .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 Field changes of dimension and detail.
 - .5 Changes made by change orders.
 - .6 Details not on original Contract Drawings.
 - .7 References to related shop drawings and modifications.
- .5 Specifications: legibly mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Amendments and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.4 FINAL SURVEY

- .1 Submit final site survey indicating elevations and locations of completed Work upon completion of work and prior to final completion site inspection.

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 SECTIONS

- .1 Section 02 61 00.01 – Soil Remediation.

1.2 MEASUREMENT PROCEDURES

- .1 Refer to Section 02 61 00.01 for measurement procedures.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CSA S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.

1.4 SUBMITTALS

- .1 Submit as-built drawings and specifications in accordance with Sections 01 33 00.
- .2 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 20

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.

1.6 SITE CONDITIONS

- .1 Should material resembling spray or trowel-applied asbestos or other designated substance be encountered, stop work, take preventative measures, and notify Departmental Representative immediately.
 - .1 Do not proceed until written instructions have been received from Departmental Representative.
- .2 Notify Departmental Representative before disrupting site access or services.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 PREPARATION

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal and recycling.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

- .3 Notify and obtain approval of utility companies before starting demolition.
- .4 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.
 - .1 Immediately notify Departmental Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.
 - .2 Immediately notify the Departmental Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 PROTECTION

- .1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of site to remain in place. Provide bracing and shoring required.
- .2 Keep noise, dust, and inconvenience to minimum.
- .3 Protect building systems, services and equipment.
- .4 Provide temporary dust screens, covers, railings, supports and other protection as required.
- .5 Do Work in accordance with Section 01 35 29.06.

3.3 SALVAGE

- .1 Remove items to be reused, store as directed by Departmental Representative.
- .2 Fuel removed during the FTA fuel line decommissioning is the property of the Contractor and may be reused. Fuel determined to be unacceptable for reuse is to be transported for off-site disposal in accordance with local regulations.

3.4 SITE REMOVALS

- .1 Remove items in accordance with Section 02 61 00.01.

3.5 DISPOSAL

- .1 Dispose of removed materials, to appropriate incineration, waste disposal or recycling facilities except where specified otherwise, in accordance with authority having jurisdiction.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 02 61 00.01 – Soil Remediation.
- .2 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.2 MEASUREMENT PROCEDURES

- .1 Refer to Section 02 61 00.01 and Section 31 23 33.01 for measurement procedures.

1.3 REFERENCES

- .1 Canadian Environmental Protection Act,1999 (CEPA 1999).
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Safety Data Sheets (SDS).
- .3 National Fire Code of Canada (2015)
- .4 Transportation of Dangerous Goods Act (TDGA), 1999 c. 34.
- .5 Transportation of Dangerous Goods Regulations (TDGR), T-19.01-SOR/2019-101.

1.4 DEFINITIONS

- .1 Toxic: substance is considered toxic if it is listed on Toxic Substances List found in Schedule 1 of CEPA.
- .2 List of Toxic Substances: found in Schedule 1 of CEPA, lists substances that have been assessed as toxic. Federal Government can make regulations with respect to a substance specified on List of Toxic Substances. Column II of this list identifies type of regulation applicable to each substance.

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Product Data:
 - .1 Submit WHMIS SDS - Safety Data Sheets.
 - .2 Submit photocopy of shipping documents and waste manifests to Departmental Representative when shipping toxic wastes off site.
 - .3 Maintain 1 copy of product data in readily accessible file on site.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Store and handle toxic wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

- .2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.
- .3 Co-ordinate storage of toxic wastes with Departmental Representative.
- .4 Observe smoking regulations in accordance with Section 01 14 00.
 - .1 Smoking is prohibited in areas where toxic wastes are stored, used, or handled.
- .5 Report spills or accidents involving toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities. Take reasonable measures to contain the release while ensuring health and safety is protected.
- .6 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.
- .7 Use authorized/licensed carrier to transport toxic waste.
- .8 Co-ordinate transportation and disposal of toxic wastes with Departmental Representative.
- .9 Dispose of toxic wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.
- .10 Ensure toxic waste is shipped to authorized/licensed treatment or disposal facility and that liability insurance requirements are met.
- .11 Minimize generation of toxic waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

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 SECTIONS

- .1 Section 31 23 33.01 – Excavation, Trenching and Backfilling.
- .2 Section 31 32 19.01 – Geotextiles.

1.2 MEASUREMENT PROCEDURES

- .1 Fixed price payment will be made for decommissioning of existing fuel lines.
- .2 Fixed price payment will be made for inspection/removal of mock-up fuselage and off-site recycling or disposal as hazardous waste.
- .3 Measure dewatering of FTA and off-site incineration in cubic metres of water removed from the excavation area.
- .4 Refer to Section 31 23 33.01 for measurement procedures related to excavation and backfill.

1.3 SUMMARY

- .1 Section includes contaminated solids (fuselage, sludge, granular material, pipes, maintenance holes, etc.) removal, off-site disposal and construction of risk management measures by placement of geotextile and fill. Remediation and construction of risk management measures work includes:
 - .1 Remedial excavation and off-site disposal from areas on site, as indicated.
 - .2 Provide equipment required for remediation.
 - .3 Transportation of all equipment, staff, clean fill, and contaminated materials, to and from site, as required.
 - .4 Co-ordination, supervision and preparation for remediation of contaminated materials. Provide Departmental Representative 2 weeks notice prior to the commencement of site work for provision of site supervision.
 - .5 Specification of final remediation design and facilities required.
 - .6 Provision and installation of materials and equipment necessary to remediate site.
 - .7 Implementation of safety work zones, temporary barriers, site Health and Safety Plans and Emergency Response Plans.
 - .8 Management of contaminated materials.
 - .9 Installation of geotextile.
 - .10 Backfilling of excavation below grade of surrounding areas with fill and grading of excavations to provide positive drainage.

1.4 REFERENCES

- .1 Agriculture and Agri-Food Canada
 - .1 The Canadian System of Soil Classification, Third Edition, 1998.

- .2 Applicable environmental and health and safety laws and regulations for Province of Ontario.
- .3 Canadian Environmental Assessment Act, 2012 (S.C. 2012, c. 19, s. 52).
- .4 CCME (Canadian Council of Ministers of the Environment) Canadian Soil Quality Guidelines, 1997 as amended.
- .5 Environmental Protection Act. R.R.O. 1990
 - .1 Chapter E19 as amended.
 - .2 O.Reg. 102/94, Waste Audits and Waste Reduction Work Plans
 - .3 O.Reg. 103/94, Industrial, Commercial and Institutional Source Separation Programs.
 - .4 O.Reg. 153-04 as amended.
 - .5 O.Reg. 347, General – Waste Management.
- .6 Ontario Water Resource Act, R.R.O.1990.
 - .1 O.Reg. 903 as amended.
- .7 Transportation of Dangerous Goods Act, 1992.
- .8 Workplace Hazardous Materials Information System (Globally Harmonized System), 2015 (WHMIS GHS).

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00.
- .2 Quality Assurance and Quality Control Submittals:
 - .1 Provide Quality Assurance and Quality Control Submittals in accordance with Section 01 33 00 - Submittals as follows:
 - .1 Provide a Detailed Work Plan that demonstrates understanding of the work sequencing, scheduling and project risks. Detailed Work Plan should include:
 - .1 Description and sketches of the phasing of the work/construction sequence and construction methodologies.
 - .2 Identification of main project risks and mitigation measures.
 - .1 Methods to correct potential containment issues.
 - .2 Primary schedule risks and potential mitigations.
 - .3 Description of emergency plans in case of breakdown, spill or other problem.
 - .4 Waste management plan and complete list of wastes, including waste registration numbers as required by provincial regulations, which will be generated by activities, and proposed disposal locations.
 - .2 Closeout Submittals:
 - .1 Provide written proof (weigh scale tickets) that contaminated materials have been disposed of at facility(ies) authorized by MECP for Province of Ontario, or other facility as approved by

the Departmental Representative, (copies are to be provided daily) with a complete package upon completion of work and prior to final completion site inspection.

- .3 Underground Utility Locates:
 - .1 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field and clearance record from utility authority prior to commencement of Work.

1.6 QUALITY ASSURANCE

- .1 Qualifications (to be provided within 10 working days of contract award):
 - .1 Identify members of project team including project manager. Define experience, education and training, qualifications, tasks and responsibilities of each team member. Supply resumes of key technical and management staff.
 - .2 Provide detailed descriptions of firm and sub-contractors, indicating experience in soil remediation in the past 5 years including names of individuals in charge of the remediation.
- .2 Regulatory Requirements:
 - .1 Perform work in accordance with:
 - .1 Acts, Regulations, Laws, guidelines codes of practice, directives and policies of government authorities pertaining to: environment; noise; water supply; waste water; air quality; health and safety; transportation; waste management.
 - .2 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.
 - .3 MECP O.Reg. 153/04, O.Reg. 347 as amended under the Environmental Protection Act.
 - .4 WHMIS GHS.
 - .5 Canadian Environmental Assessment Act.
 - .6 Canadian Environmental Protection Act (New Substance Notification Regulations).
 - .7 Transportation of Dangerous Goods Act.
 - .8 National Building Code of Canada 2015.
 - .9 National Fire Code of Canada, 2015
 - .10 Canadian Electrical Code 2018.
 - .11 Ontario Electrical Safety Code 2018, and all bulletins (Ontario).
 - .12 The Fisheries Act
 - .13 Migratory Birds Convention Act.
 - .14 Migratory Birds Regulations
 - .3 Departmental Representative to collect and submit samples to laboratories.

1.7 DELIVERY, STORAGE, AND HANDLING

- .1 Contaminated Materials:

- .1 Place excavated contaminated solid materials directly in covered metal containers for transportation off site for recycling, disposal as hazardous waste, or incineration. Transport and dispose of contaminated materials according to current regulations.
 - .1 Do not dilute contaminated materials with less contaminated soil.
 - .2 Materials that are suitable for metal recycling shall be recycled in accordance with Section 01 74 20.
 - .3 Materials that have been de-watered or dried and classified as solid waste as per O.Reg. 347 must be and placed in covered containers for hazardous waste transport and off site disposal.
 - .4 Liquid waste must be placed in covered water-tight containers for hazardous waste transport and off site disposal via incineration.
- .2 New Materials and Equipment:
 - .1 All backfill must be new imported Type 2 and Type 3 fill.
 - .2 Ship, store and preserve in original packaging with manufacturer's seal and label remain intact.
 - .3 Ensure materials and equipment are not damaged, altered or soiled during shipment, handling and storage.
 - .4 Transport rejected equipment and materials from work site immediately.
 - .5 Store materials and equipment according to manufacturer's and supplier's instructions.
 - .6 Establish quality management system for materials and equipment.

1.8 PROJECT/SITE CONDITIONS

- .1 Existing Conditions:
 - .1 Review supporting documentation, included in the Bid Documents, summarizing extent of contamination.
 - .2 Conduct, with Departmental Representative, condition survey of existing fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .3 Protect existing surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
 - .4 Protect existing monitoring wells from damage or from being covered with soil or other material while Work is in progress. In event of damage, immediately notify Departmental Representative prior to proceeding with repair as directed by the Departmental Representative.
 - .5 Protect non-contaminated material from adjacent contaminated soil.

1.9 SEQUENCING

- .1 Decontaminate equipment used in remediation procedures before removing equipment from work area.

1.10 MAINTENANCE

- .1 Access Roads:
 - .1 Maintain access roads, and all areas used for access, as follows:

- .1 Maintain and clean for duration of Work.
- .2 Repair damage incurred from use.
- .3 Provide photographic documentation of roads/areas used by construction vehicles before, during and after Work.

Part 2 Products

2.1 EQUIPMENT

- .1 Leave equipment and machinery running only while in use, except where extreme temperatures prohibit shutting down.
- .2 Metal containers:
 - .1 Clean prior to delivery to site.
 - .2 Cover containers with tarpaulins when not in active use.
 - .3 Cover containers when transporting contaminated materials off-site.
 - .4 Use sealed water-tight metal containers that do not allow leakage of contaminated water or soil for transporting contaminated materials off-site in accordance with Article 3.5 Soil Remediation.

Part 3 Execution

3.1 BACKGROUND INFORMATION

- .1 Maximum Concentrations of contaminants reported above the relevant criteria at the site for sediment from the FTA are as follows:
 - .1 Perfluorooctane Sulfonate (PFOS): 770,000 µg/kg
- .2 Maximum Concentrations of contaminants reported above the relevant criteria at the site for surface water are as follows:
 - .1 PFOS: 1,900 µg/L
 - .2 PHC F2: 2,000 µg/L
- .3 Maximum Concentrations of contaminants reported above the relevant criteria at the site in the soil surrounding the FTA are as follows:
 - .1 PFOS: 2,200 µg/kg
- .4 Maximum Concentrations of contaminants reported above the relevant criteria at the site in the groundwater surrounding the FTA are as follows:
 - .1 PFOS: 1,500 µg/L
 - .2 Benzene: 770 µg/L
 - .3 Toluene: 3,300 µg/L

3.2 EQUIPMENT

- .1 Decontaminate between loads of contaminated soil and clean fill.
- .2 Clean meticulously at end of Work.
- .3 Cover truck bodies with tarpaulins during transportation.

3.3 PREPARATION/PROTECTION

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Protection:
 - .1 Install erosion and sediment control measures in accordance with Section 01 35 43.
 - .2 Keep excavation sites water free throughout work and manage recovered water according to contamination level and provincial, municipal and territory regulations.
 - .3 Protect excavation from rainwater.
 - .4 Provide temporary structures to divert flow of surface waters from excavation.
 - .5 Provide safety measures to ensure worker and public safety.
 - .6 Protect buried services that are required to remain undisturbed.

3.4 TEMPORARY SUSPENSION OF WORK

- .1 Temporarily suspend work activities for environmental non-compliance.

3.5 METHOD OF REMEDIATION AND RISK MANAGEMENT (R/RM)

- .1 Provide Departmental Representative 2 weeks notice prior to the commencement of site work for provision of site supervision.
- .2 Mobilization, Utility Locates and Site Preparation:
 - .1 The completion of an updated survey of underground utilities.
 - .2 The supply and installation of a containment system in the work area adjacent to the FTA identified as the laydown area and area designated for hazardous waste transport and incineration containers.
- .3 Fuel Line Decommissioning (Phase 1):
 - .1 Drain and cap existing fuel lines at the point of entry to the FTA and inside the fill point building, as indicated.
 - .1 Fuel lines were previously flushed; however, may still contain liquid/fuel.
- .4 Removal of Standing Water from the FTA (Phase 1):
 - .1 Remove standing water from the FTA foam pit and containment area.
 - .2 Pump water from the FTA directly into covered water-tight containers for hazardous waste transport and off-site incineration.
 - .3 Minimize the potential for leaks and spills during removal of water from the FTA.
 - .1 Provide secondary containment for covered water-tight containers.
 - .2 Remediate areas impacted by leaks or spills of water from the FTA in accordance with Article 3.5.7 Excavation above FTA Primary Liner.
 - .4 Remove covered water-tight containers from site prior to site demobilization.
 - .5 Remove covered water-tight containers from site prior to freezing conditions.

- .6 Place a tarp over the entire FTA after removal of standing water to prevent water accumulation during off-work periods.
 - .1 Tarp to be installed to provide positive drainage and prevent pooling of water on tarp.
- .5 Inspection and Removal of Mock-Up Fuselage (Phase 1):
 - .1 Inspect mock-up fuselage and pump standing water directly into covered water-tight containers for hazardous waste transport and off-site incineration.
 - .2 Remove fuel lines from the FTA.
 - .3 Remove the mock-up fuselage by one of the two processes listed below:
 - .1 The placement of dried steel sections into containers for transport to an off-site steel plant for melting as scrap steel.
 - .1 Do work in accordance with Fuselage Recycling – Handling and Transportation Plan in Section 01 35 13.43.
 - .2 The placement of dried steel sections into covered containers for hazardous waste transport and off-site disposal as hazardous waste at MECP licensed landfill(s) or other facility as approved by the Departmental Representative. Contractor assumes all responsibility for damages and liabilities associated with handling, transportation and disposal of contaminated steel.
- .6 Removal of Water between Primary and Secondary Liners (Phase 1):
 - .1 Remove water between the primary and secondary liners by pumping water from monitoring maintenance hole #3 until the system is fully dewatered. Multiple pumping cycles may be required to allow for all the water to flow to monitoring maintenance hole #3.
 - .1 Water removed from the FTA shall be placed directly into water-tight containers for hazardous waste transport and off-site incineration.
- .7 Excavation above FTA Primary Liner (Phase 2):
 - .1 Dewater the solid material (sludge, granular material and pipes) above the primary liner and pump water directly into covered water-tight containers for hazardous waste transport and disposal.
 - .2 Excavate sludge, granular material and pipes to lines, grades, elevations and dimensions as indicated, in accordance with Section 31 23 33.01 and in accordance with design drawings.
 - .1 Excavate to a depth of approximately 100 mm above the primary liner.
 - .2 Commence excavation from the centre of the FTA and proceed outwards towards the containment berms.
 - .3 Place excavated solid materials into covered containers for hazardous waste transport and off-site disposal.
 - .4 Do not commence excavation of FTA Primary Liner until Departmental Representative has inspected and approved of excavation work.
- .8 Excavation of FTA Primary Liner (Phase 3):
 - .1 Dewater the solid material (sludge, granular material and pipes) and pump water directly into covered water-tight containers for hazardous waste transport and off-site incineration.

- .2 Excavate the primary liner, granular material and pipes to lines, grades, elevations and dimensions as indicated, in accordance with Section 31 23 33.01.
 - .1 Excavate to a depth of approximately 100 mm above the secondary liner.
 - .2 Commence excavation from the centre of the FTA and proceed outwards towards the containment berms.
- .3 Place excavated solid materials into covered containers for hazardous waste transport and off-site disposal.
- .4 Do not commence excavation of FTA Secondary Liner until Departmental Representative has inspected and approved of excavation work.
- .9 Excavation of FTA Secondary Liner (Phase 4):
 - .1 Dewater the solid material (sludge, granular material and pipes) and pump water directly into covered water-tight containers for hazardous waste transport and off-site incineration.
 - .2 Excavate the secondary liner, granular material, containment berms and sand fill below the secondary liner to lines, grades, elevations and dimensions as indicated, in accordance with Section 31 23 33.01.
 - .1 Prior to the excavation of solid material below the secondary liner, dewater the solid material and pump directly in covered water-tight containers for hazardous waste transport and off-site incineration.
 - .2 Commence excavation from the centre of the FTA and proceed outwards towards the containment berms.
 - .3 Do not remove native soils.
 - .3 Place excavated solid materials into covered containers for hazardous waste transport and off-site disposal.
- .10 Excavation of FTA Monitoring Maintenance Holes (Phase 5):
 - .1 Excavate monitoring maintenance holes and associated pipes to lines, grades, elevations and dimensions as indicated, in accordance with Section 31 23 33.01.
 - .2 Place excavated solid materials into covered containers for hazardous waste transport and off-site disposal.
 - .3 Metals determined to be suitable for off-site steel recycling shall be placed in covered containers for transport to an off-site steel plant for scrap metal recycling
 - .1 Do work in accordance with Fuselage Recycling – Handling and Transportation Plan in Section 01 35 13.43.
 - .2 Removal of solid material (sludge, granular material) from metals, determined to be suitable for steel recycling, using a liquid solution is not permitted unless the wash water is fully captured and handled as hazardous waste.

3.6 EXCAVATION

- .1 Do not proceed with excavation operations until completion of following:
 - .1 Pre-Excavation Survey in accordance with Section 31 23 33.01
- .2 Excavate contaminated soils to prevent contamination of non-contaminated soils.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.

- .4 Off-site disposal of contaminated materials:
 - .1 Dispose of contaminated materials in accordance with DELIVERY, STORAGE, AND HANDLING Article of this Section.
 - .2 Locate licensed waste disposal facility that will accept the materials for disposal as hazardous waste.
 - .1 Determine if TCLP or other testing in addition to that provided by the Departmental Representative is required and fulfill any additional disposal requirements.
 - .1 Consultant to conduct any additional TCLP sample collection and analysis.
 - .2 Copies of all disposal weight tickets to be provided to the Departmental Representative.
- .5 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .6 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.
- .8 Clean areas of contamination resulting from project activity.

3.7 RESTORATION (PHASE 6)

- .1 Do not proceed with restoration operations until completion of following:
 - .1 Departmental Representative has inspected and approved of excavation work.
 - .2 Consultant has collected samples from the native soil below the sand fill for analysis of Poly-and Per-fluoroalkyl Substances (PFAS) and Petroleum Hydrocarbons (PHC).
 - .1 Provide for the safe collection of soil samples in accordance with Section 01 35 29.
 - .3 Completed Excavation Survey in accordance with Section 31 23 33.01.
- .2 Place Type 3 fill in monitoring maintenance hole excavations and pipe trenches as indicated, in accordance with Section 31 23 33.01.
- .3 Place geotextile, as indicated, in accordance with Section 31 32 19.01.
- .4 Place Type 3 and Type 2 fill, as indicated, in accordance with Section 31 23 33.01.
 - .1 Mound fill at 1% to provide positive drainage.
- .5 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .6 Clean and reinstate areas affected by Work as directed by Departmental Representative.
 - .1 Conduct final inspection of access roads with Departmental Representative and reinstate access roads as directed by Departmental Representative.
- .7 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

- .8 Clean areas of contamination resulting from project activity.

3.8 FIELD QUALITY CONTROL

- .1 Site Tests:
 - .1 Ensure leachate test (TCLP) results (if requested by the landfill) conform to acceptance criteria of licensed landfill where contaminated materials will be deposited and provincial hazardous waste regulations.
 - .2 Remove and replace non-compliant materials.

3.9 EQUIPMENT DECONTAMINATION

- .1 Decontaminate equipment used in work. Remove from site at end of work.

3.10 CLEANING

- .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 02 61 00.01 – Soil Excavation.
- .2 Section 31 32 19.01 – Geotextiles.

1.2 MEASUREMENT PROCEDURES

- .1 Excavated materials will be measured in cubic metres in their original location.
 - .1 Common excavation quantities measured will be actual volume removed within the following limits:
 - .1 Width for excavation as indicated.
 - .2 Width for excavation for structures as indicated.
 - .3 Depth from ground elevation immediately prior to excavation, to elevation as indicated by Departmental Representative.
 - .2 Shoring, bracing, cofferdams and underpinning of excavation will not be measured separately for payment.
 - .3 Backfilling to authorized excavation limits will not be measured separately for payment.
- .2 Measure backfilling in cubic metres of material compacted in place.

1.3 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C117-17, Standard Test Method for Materials Finer than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136/C136M-19, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³))
 - .4 ASTM D4318, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB8.2-M88, Sieves, Testing, Woven Wire, Metric Series.
- .3 MECP Table 1 “Full Depth Background Site Conditions Standards” under “Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the Environmental Protection Act” dated April 15, 2011 of the Ontario Regulation (“O. Reg.”) 153/04 as amended.
- .4 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS.PROV 1010 (Apr 2013), Material Specification for Aggregates-Base, Subbase, Select Subgrade, and Backfill Material.

1.4 DEFINITIONS

- .1 Excavation classes: two classes of excavation will be recognized; common excavation and rock or obstruction excavation.
 - .1 Rock excavation: solid material in excess of 1.0 m³ and which cannot be removed by means of mechanical excavating equipment. Frozen material not classified as rock.
 - .2 Common excavation: excavation of soil or material of whatever nature, which are not included under definitions of rock excavation.
- .2 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .3 Unsuitable materials:
 - .1 Weak, chemically unstable, and compressible materials.
 - .2 Frost susceptible materials:
 - .1 Fine grained soil with plasticity index less than 10 when tested to ASTM D4318, and gradation within limits specified when tested to ASTM C117 and ASTM C136/C136M: Sieve sizes to CAN/CGSB8.2.
 - .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 soil containing more than 20% by mass passing 0.075 mm sieve.

1.5 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00.
- .2 Quality Control: in accordance with Section 01 45 00:
 - .1 Submit to Departmental Representative written notice when bottom and limits of excavation is reached.
 - .1 Departmental Representative may collect samples prior any additional Work.
- .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 Inform Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.
- .5 Pre-Excavation Survey:
 - .1 Submit elevation and location survey of existing ground surface at least 5 days prior to the start of excavation.

- .6 Completed Excavation Survey:
 - .1 Submit elevation and location survey of completed excavation within 10 working days of completion of excavation.

1.6 HEALTH AND SAFETY REQUIREMENTS

- .1 Do construction occupational health and safety in accordance with Section 01 35 29.06.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.
- .2 Dispose of contaminated materials in accordance with Section 02 61 00.01.

1.8 EXISTING CONDITIONS

- .1 Buried services:
 - .1 Before commencing work establish location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services within excavation area: cap cut-offs.
 - .4 Size, depth and location of existing utilities and structures are not known.
 - .5 Prior to beginning excavation Work, notify Departmental Representative and applicable authorities having jurisdiction. Establish location and state of use of buried utilities and structures. Authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by careful test excavations or soil hydrovac methods, as required.
 - .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered.
 - .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before re-routing.
 - .9 Record location of maintained, re-routed and abandoned underground lines.
 - .10 Confirm with Departmental Representative locations of recent excavations adjacent to area of excavation.
- .2 Existing surface features:
 - .1 Conduct, with Departmental Representative, condition survey of fencing, service poles, wires, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.

Part 2 Products

2.1 BACKFILL

- .1 Type 2 fill: Granular B, Type II to OPSS.PROV 1010.

- .2 Type 3 fill: selected material from excavation or other sources, approved by Consultant for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, slag, sods, refuse or other deleterious materials.
- .3 All backfill material to meet MECP Table 1.
 - .1 Departmental Representative may permit concentrations of naturally occurring metals that the exceed requirements of MECP Table 1.
 - .1 Submit documentation supporting the elevated concentrations for approval of Departmental Representative.

Part 3 Execution

3.1 SITE PREPARATION

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

3.2 PREPARATION/PROTECTION

- .1 Protect existing features in accordance with Section 01 56 00 and applicable local regulations.
- .2 Keep excavations clean and free of loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.3 STOCKPILING

- .1 Stockpile fill materials in areas approved by Departmental Representative.
 - .1 Stockpile granular materials in manner to prevent segregation.
- .2 Protect fill materials from contamination.
- .3 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.4 DEWATERING

- .1 Dispose of water in accordance with Section 02 61 00.01.

3.5 EXCAVATION

- .1 Advise Departmental Representative at least 5 working days in advance of excavation operations.

- .2 Survey elevations and locations of existing ground surface for FTA prior to start of excavation.
- .3 Excavate areas, as indicated.
- .4 Restrict vehicle operations directly adjacent to open excavations.
- .5 Dispose of contaminated excavated materials off-site in accordance with Section 02 61 00.01.
- .6 Do not obstruct flow of surface drainage or natural watercourses.
- .7 Notify Departmental Representative when bottom and limits of excavation is reached.
 - .1 Consultant will sample soil at base and limits of excavation.
- .8 Obtain Departmental Representative approval of completed excavation.
- .9 Correct unauthorized over-excavation as directed by Departmental Representative.
- .10 Remove loose soil and debris from excavations.
- .11 Survey elevations and locations of completed excavation.

3.6 BACKFILL

- .1 Backfill in accordance with Section 02 61 00.01.
- .2 Compact backfill in 300 mm thick lifts to a minimum of 95% Standard Proctor Maximum Dry Density (SPMDD).

3.7 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Reinstate excavation areas in accordance with Section 02 61 00.01 and to provide positive drainage.
- .3 Clean and reinstate areas affected by Work as directed by Departmental Representative.
- .4 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

- .1 Section 31 23 33.01 - Excavating, Trenching and Backfilling.

1.2 REFERENCES

- .1 Ontario Provincial Standard Specifications (OPSS)
 - .1 OPSS.PROV 1860, November 2019, Material Specification for Geotextiles.

1.3 MEASUREMENT PROCEDURES

- .1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams and overlaps..

1.4 SUBMITTALS

- .1 Submit to Departmental Representative electronic copy of mill test data and certificate at least 2 weeks prior to start of Work, and in accordance with Section 01 33 00.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents and handle materials in accordance with manufacturer's written instructions.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling.
- .2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling.
- .4 Fold up metal banding, flatten and place in designated area for recycling.

Part 2 Products

2.1 MATERIAL

- .1 Geotextile: OPSS.PROV 1860 Class II non-woven synthetic fibre fabric, supplied in minimum 4.0 metre wide rolls.

Part 3 Execution

3.1 INSTALLATION

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.
- .4 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .6 After installation, cover with overlying layer within 4 h of placement.
- .7 Replace damaged or deteriorated geotextile to approval of Departmental Representative.
- .8 Place and compact backfill in accordance with Section 31 23 33.01.

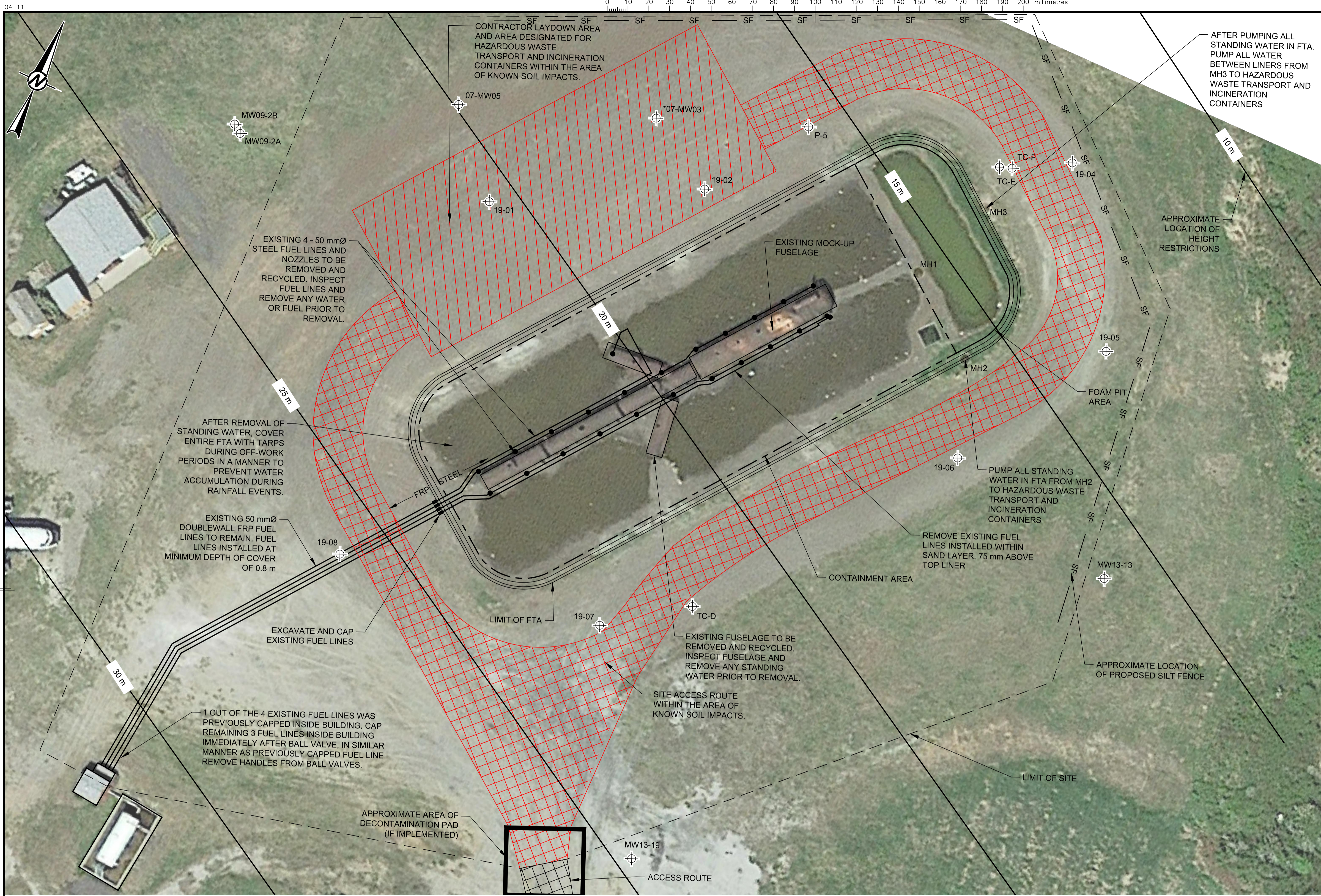
3.2 CLEANING

- .1 Remove construction debris from Project site and dispose of debris in an environmentally responsible and legal manner.

3.3 PROTECTION

- .1 Vehicular traffic not permitted directly on geotextile.

END OF SECTION



Public Services and Procurement Canada
 Architectural and Engineering Services
 Ontario Region
 Services publics et Approvisionnement Canada
 Services d'architecture et de génie
 Région de l'Ontario

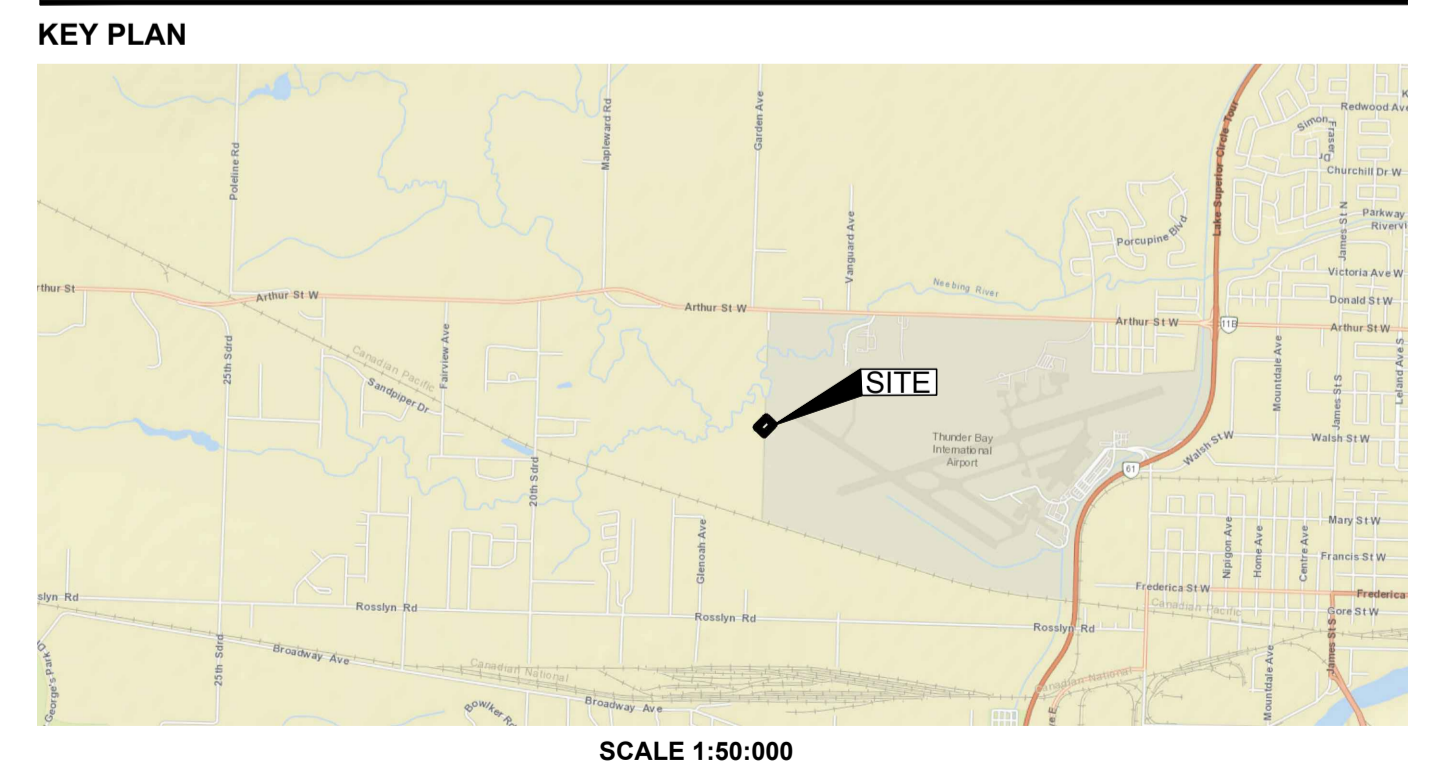
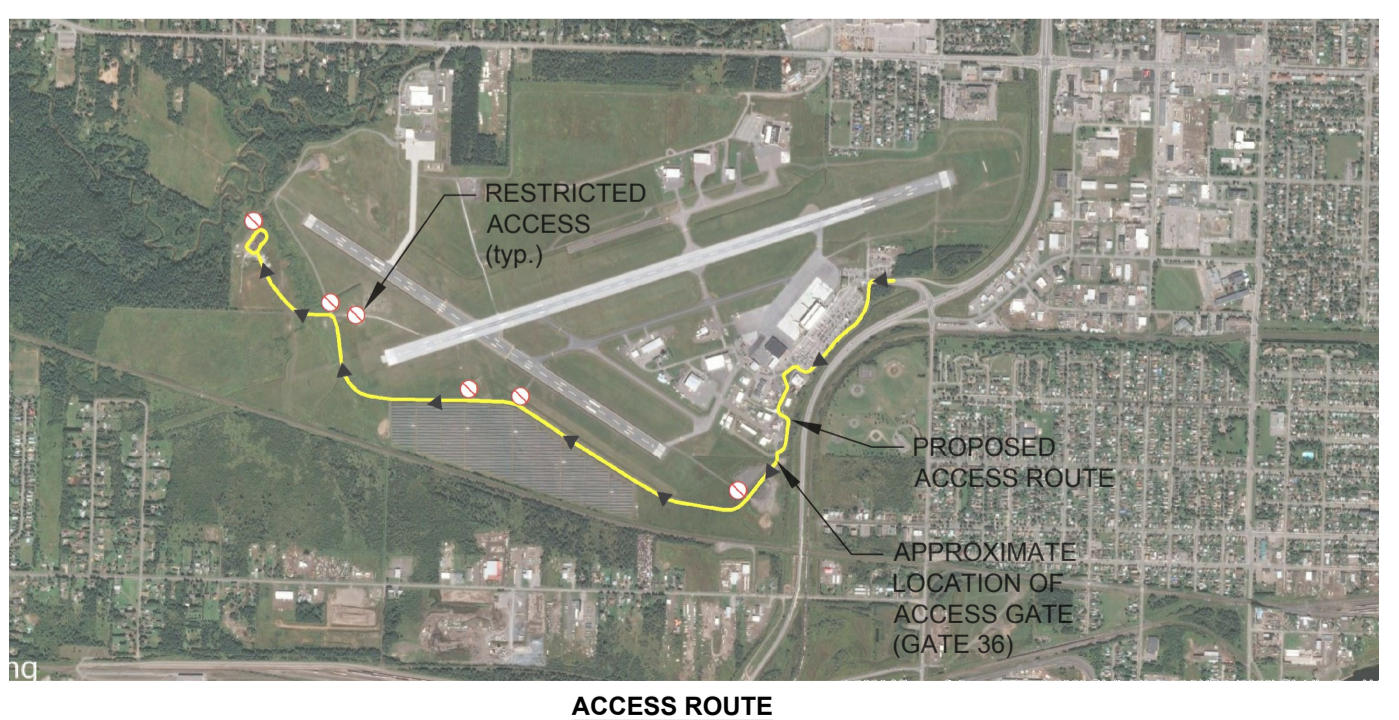
04	100% SUBMISSION	2020-05-08
03	99% SUBMISSION	2020-03-27
02	66% SUBMISSION	2020-02-14
01	33% SUBMISSION	2020-01-10
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

	A	Detail No.
	B	No. du détail
	C	drawing no. - where detail required dessin no. - où détail exigé
		drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
Ontario
PUBLIC SERVICES AND PROCUREMENT CANADA
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT
drawing title
titre du dessin
SITE PLAN (PHASE 1)

drawn by dessiné par	ABD	project manager administrateur de projets
designed by conc par	SWT	
approved by approuvé par	TL	
project date date du projet	2020-02-14	
project no. no. du projet	R.106042.001	
drawing no. dessiné no.	C01	



LEGEND

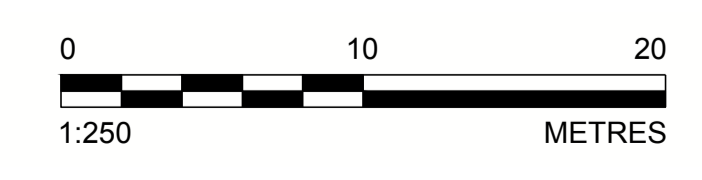
- NOZZLE FOR FUEL LINE
- FUEL LINES RUNNING FROM THE FUEL STORAGE AREA TO THE FTA MOCK-UP FUSELAGE
- ⊕ APPROXIMATE LOCATION OF MONITORING WELL TO BE PROTECTED AND PRESERVED IN WORKING CONDITION

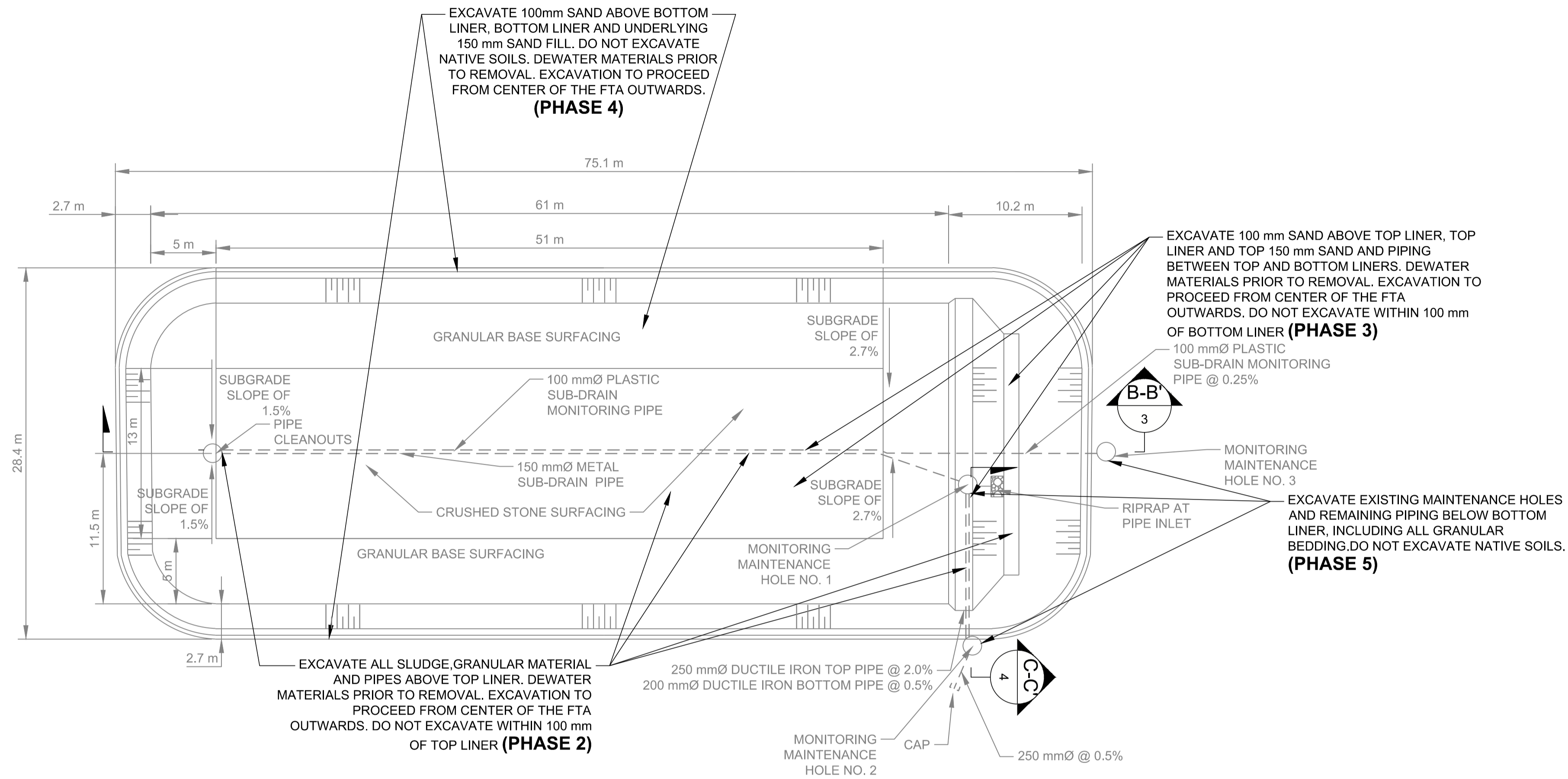
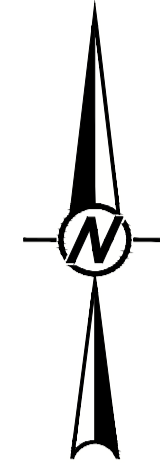
REFERENCE(S)

- EXISTING INFORMATION SUPPLIED BY CANTEC DESIGN-DRAFTING SERVICE, PROJECT # 785180, JULY 1991

NOTE(S)

- *07-MW03 MAY HAVE BEEN PREVIOUSLY BURIED OR DESTROYED



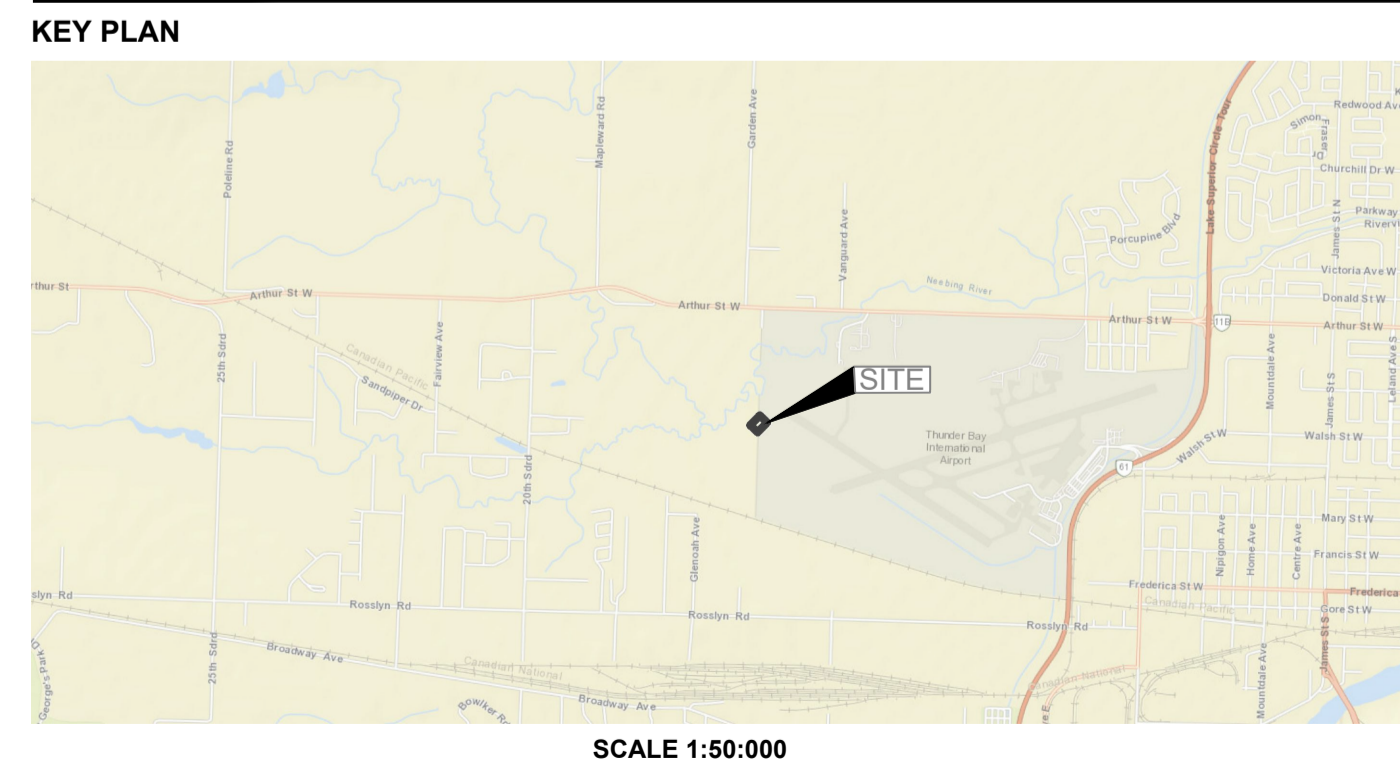
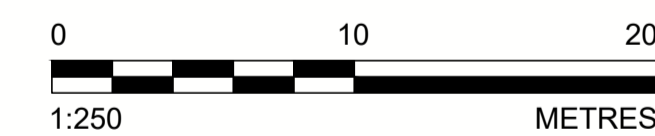


EXCAVATE ALL SLUDGE, GRANULAR MATERIAL AND PIPES ABOVE TOP LINER. DEWATER MATERIALS PRIOR TO REMOVAL. EXCAVATION TO PROCEED FROM CENTER OF THE FTA OUTWARDS. DO NOT EXCAVATE WITHIN 100 mm OF TOP LINER (PHASE 2)

EXCAVATE 100mm SAND ABOVE BOTTOM LINER, BOTTOM LINER AND UNDERLYING 150 mm SAND FILL. DO NOT EXCAVATE NATIVE SOILS. DEWATER MATERIALS PRIOR TO REMOVAL. EXCAVATION TO PROCEED FROM CENTER OF THE FTA OUTWARDS. (PHASE 4)

EXCAVATE 100 mm SAND ABOVE TOP LINER, TOP LINER AND TOP 150 mm SAND AND PIPING BETWEEN TOP AND BOTTOM LINERS. DEWATER MATERIALS PRIOR TO REMOVAL. EXCAVATION TO PROCEED FROM CENTER OF THE FTA OUTWARDS. DO NOT EXCAVATE WITHIN 100 mm OF BOTTOM LINER (PHASE 3)

EXCAVATE EXISTING MAINTENANCE HOLES AND REMAINING PIPING BELOW BOTTOM LINER, INCLUDING ALL GRANULAR BEDDING. DO NOT EXCAVATE NATIVE SOILS. (PHASE 5)



- REFERENCE(S)**
- EXISTING INFORMATION SUPPLIED BY CANTEC DESIGN-DRAFTING SERVICE, PROJECT # 785180, JULY 1991

REFER TO DRAWINGS C03 AND C04 FOR DETAILS ON PHASES 2 TO 5



Public Services and Procurement Canada
 Architectural and Engineering Services
 Ontario Region
 Services publics et Approvisionnement Canada
 Services d'architecture et de génie
 Région de l'Ontario

04		
03	99% SUBMISSION	2020-03-27
02	66% SUBMISSION	2020-02-14
01	33% SUBMISSION	2020-01-10
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

A	Detail No. No. du détail
B	drawing no. - where detail required dessin no. - où détail exigé
C	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
Ontario
PUBLIC SERVICES AND PROCUREMENT CANADA
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT

drawing title
titre du dessin
REMOVALS PLAN
(PHASE 2 TO 5)

drawn by
dessiné par ABD

designed by
conçu par SWT

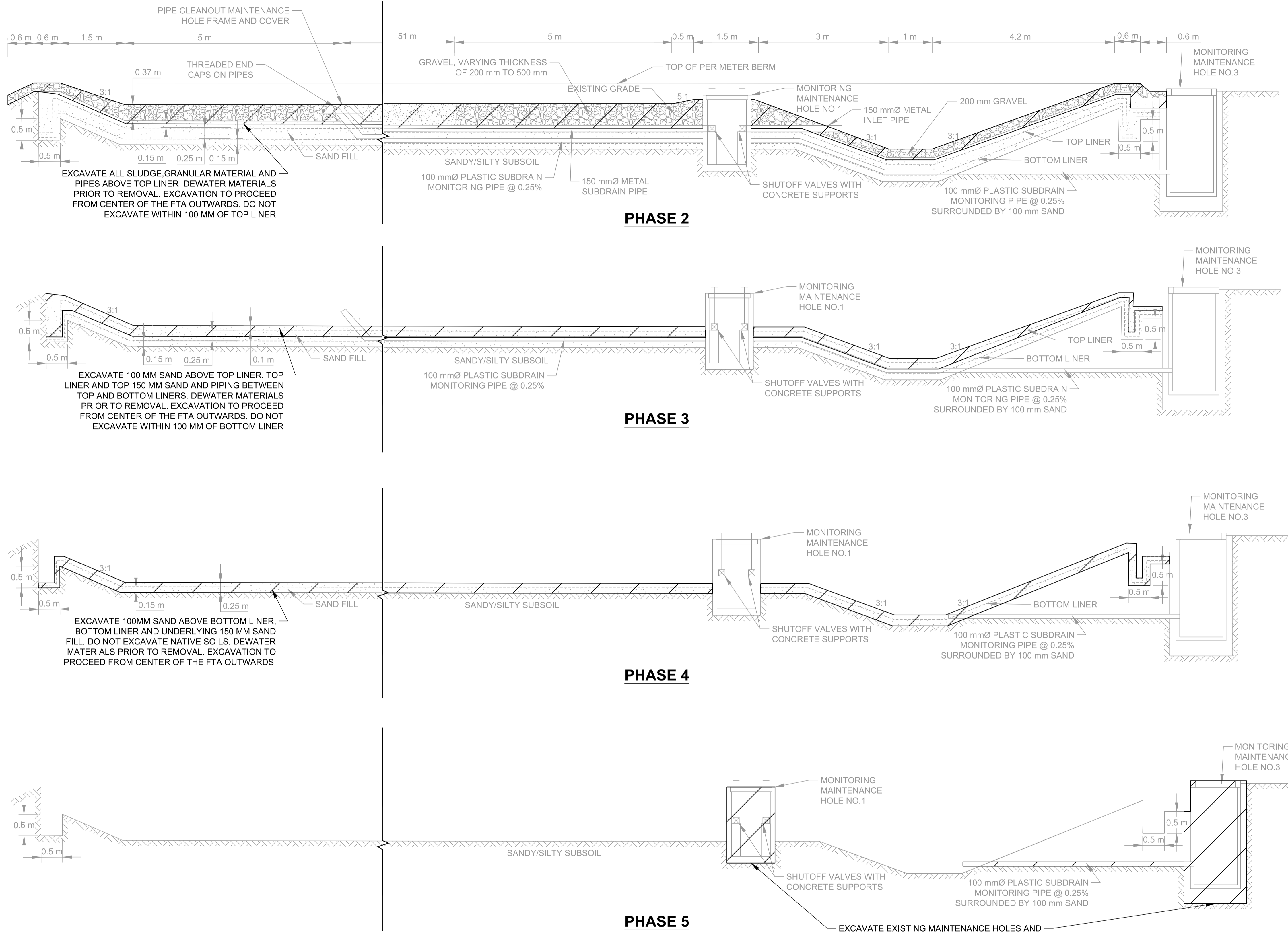
approved by
approuvé par TL

bid submission
project manager
administrateur de projets

project date
date du projet 2020-02-14

project no.
no. du projet R.106042.001

drawing no.
dessiné no. C02



EXCAVATE ALL SLUDGE, GRANULAR MATERIAL AND PIPES ABOVE TOP LINER. DEWATER MATERIALS PRIOR TO REMOVAL. EXCAVATION TO PROCEED FROM CENTER OF THE FTA OUTWARDS. DO NOT EXCAVATE WITHIN 100 MM OF TOP LINER

EXCAVATE 100 MM SAND ABOVE TOP LINER, TOP LINER AND TOP 150 MM SAND AND PIPING BETWEEN TOP AND BOTTOM LINERS. DEWATER MATERIALS PRIOR TO REMOVAL. EXCAVATION TO PROCEED FROM CENTER OF THE FTA OUTWARDS. DO NOT EXCAVATE WITHIN 100 MM OF BOTTOM LINER

EXCAVATE 100MM SAND ABOVE BOTTOM LINER, BOTTOM LINER AND UNDERLYING 150 MM SAND FILL. DO NOT EXCAVATE NATIVE SOILS. DEWATER MATERIALS PRIOR TO REMOVAL. EXCAVATION TO PROCEED FROM CENTER OF THE FTA OUTWARDS.

EXCAVATE EXISTING MAINTENANCE HOLES AND REMAINING PIPING BELOW BOTTOM LINER, INCLUDING ALL GRANULAR BEDDING. DO NOT EXCAVATE NATIVE SOILS.

KEY PLAN



SCALE 1:50,000

04		
03	99% SUBMISSION	2020-03-27
02	66% SUBMISSION	2020-02-14
01	33% SUBMISSION	2020-01-10
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

- A Detail No. No. du détail
- B drawing no. - where detail required dessin no. - où détail exigé
- C drawing no. - where detailed dessin no. - où détaillé

project title
 titre du projet
 Ontario
 PUBLIC SERVICES AND PROCUREMENT CANADA
 FTA REMEDIATION DESIGN
 THUNDER BAY AIRPORT

drawing title
 titre du dessin
 SECTION B (PHASES 2 TO 5)

drawn by
 dessiné par ABD

designed by
 conc par SWT

approved by
 approuvé par TL

bid submission
 soumission

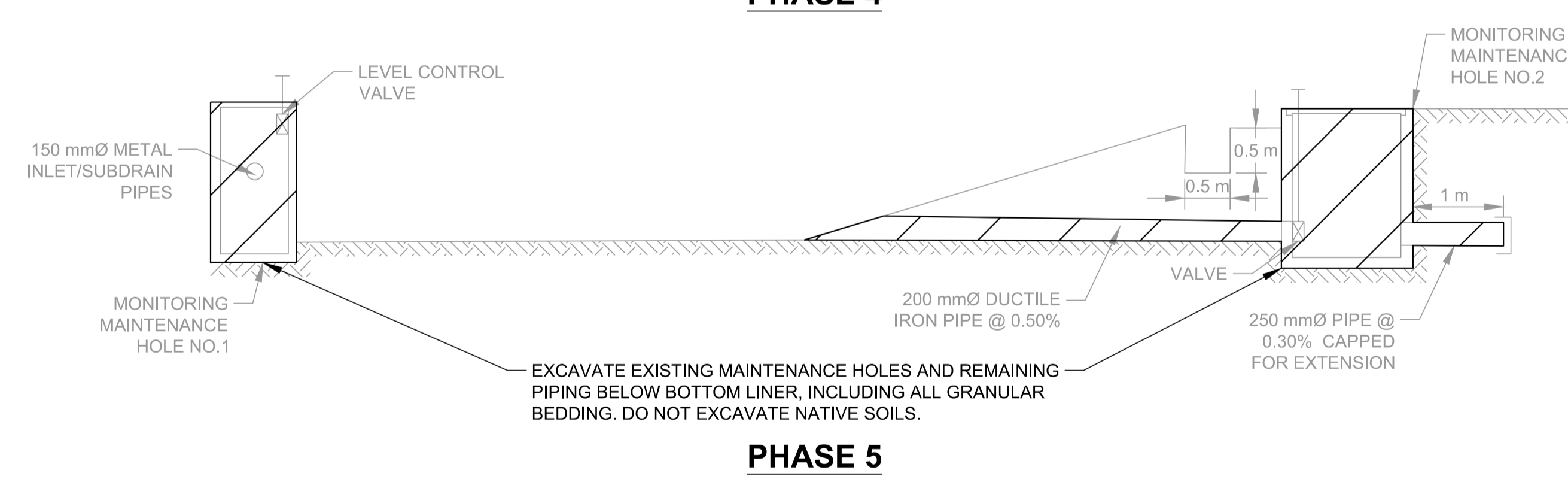
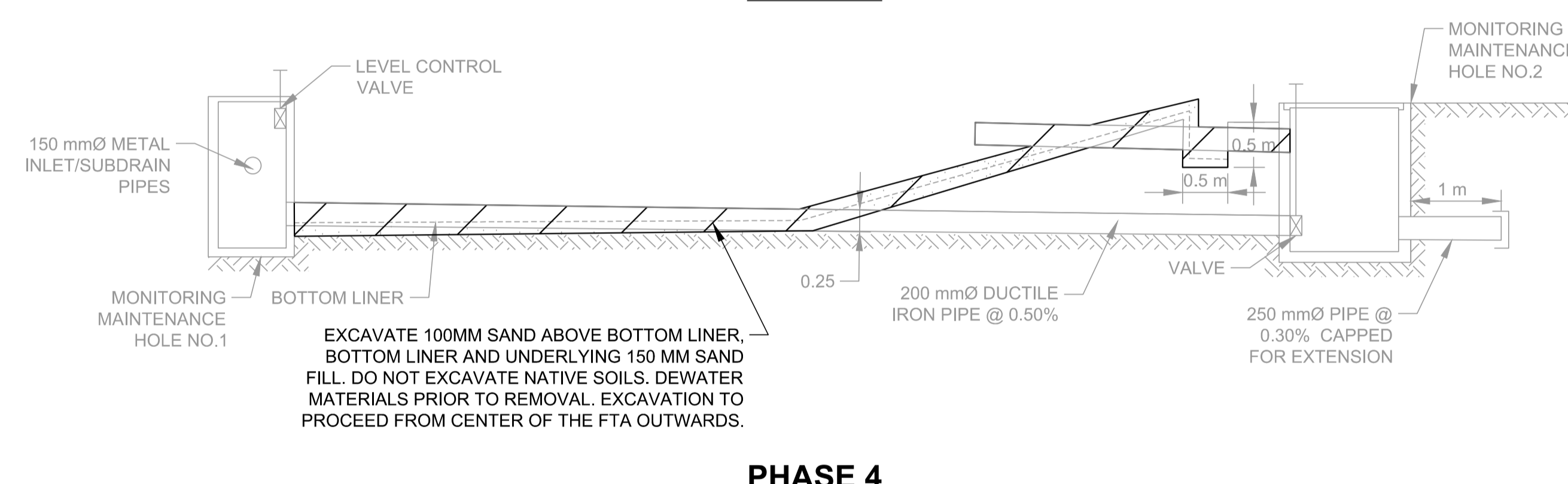
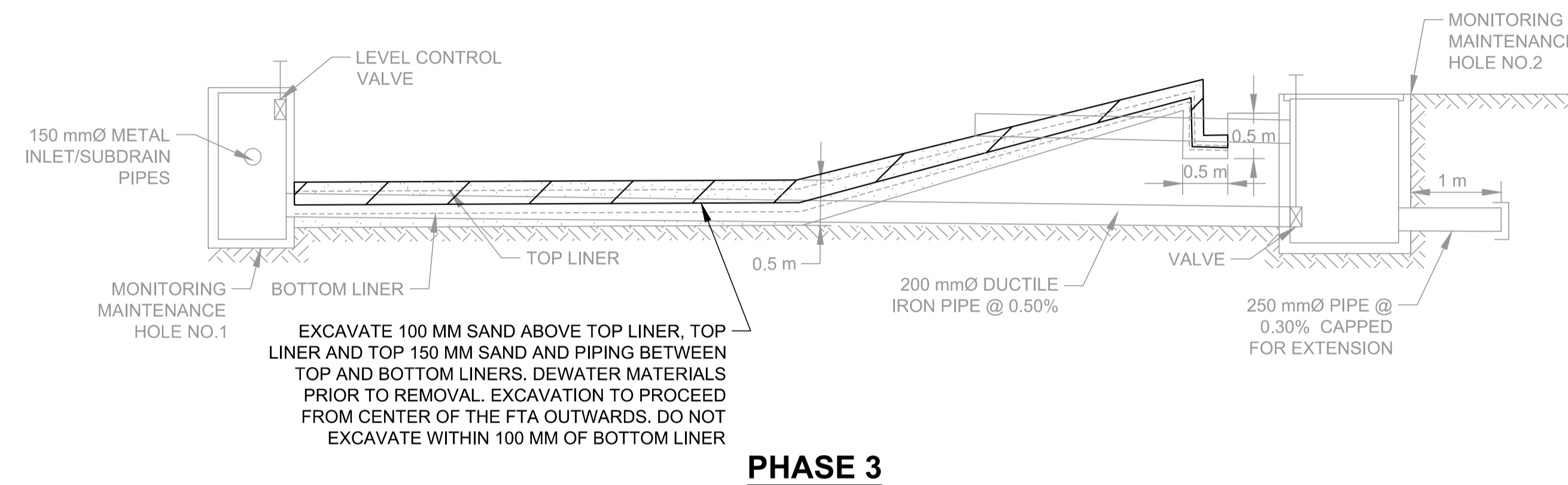
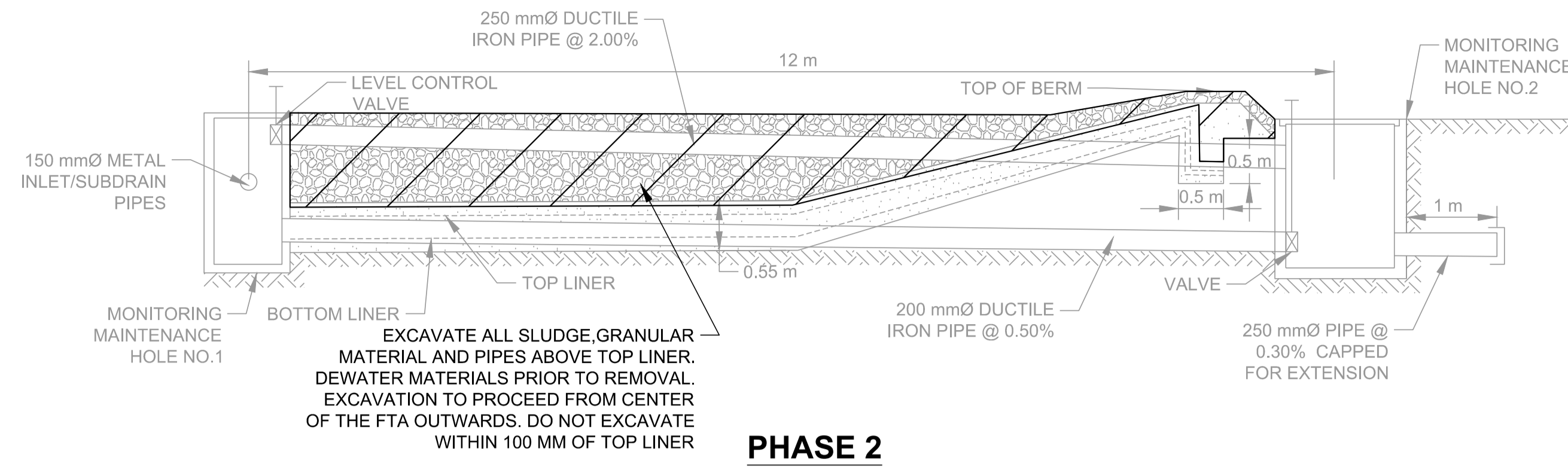
project manager
 administrateur de projets

project date
 date du projet 2020-02-14

project no.
 no. du projet R.106042.001

drawing no.
 dessiné no. C03





KEY PLAN



REFERENCE(S)

- EXISTING INFORMATION SUPPLIED BY CANTEC DESIGN-DRAFTING SERVICE, PROJECT # 785180, JULY 1991

Public Services and Procurement Canada
 Architectural and Engineering Services
 Ontario Region
 Services publics et Approvisionnement Canada
 Services d'architecture et de génie
 Région de l'Ontario

04		
03	99% SUBMISSION	2020-03-27
02	66% SUBMISSION	2020-02-14
01	33% SUBMISSION	2020-01-10
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

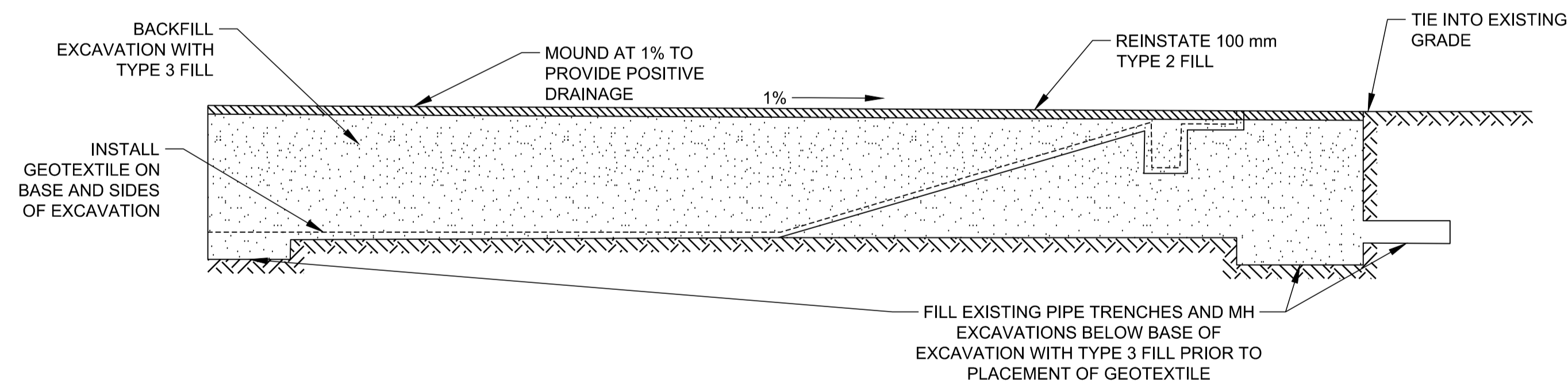
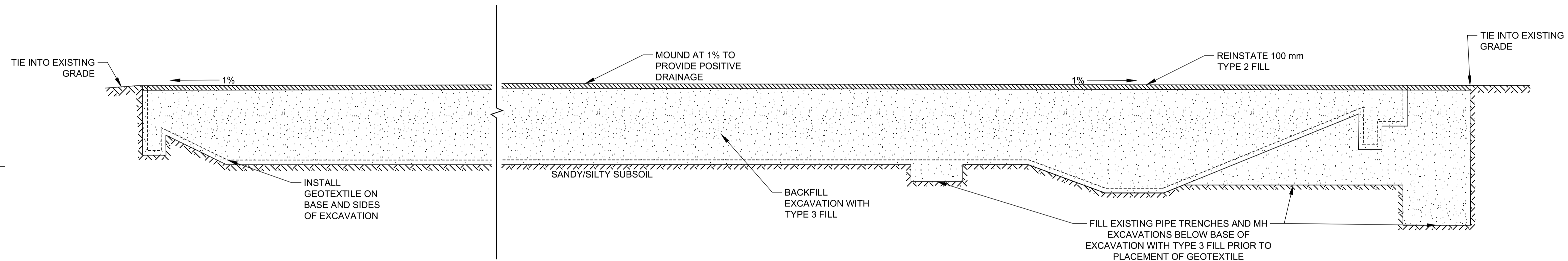
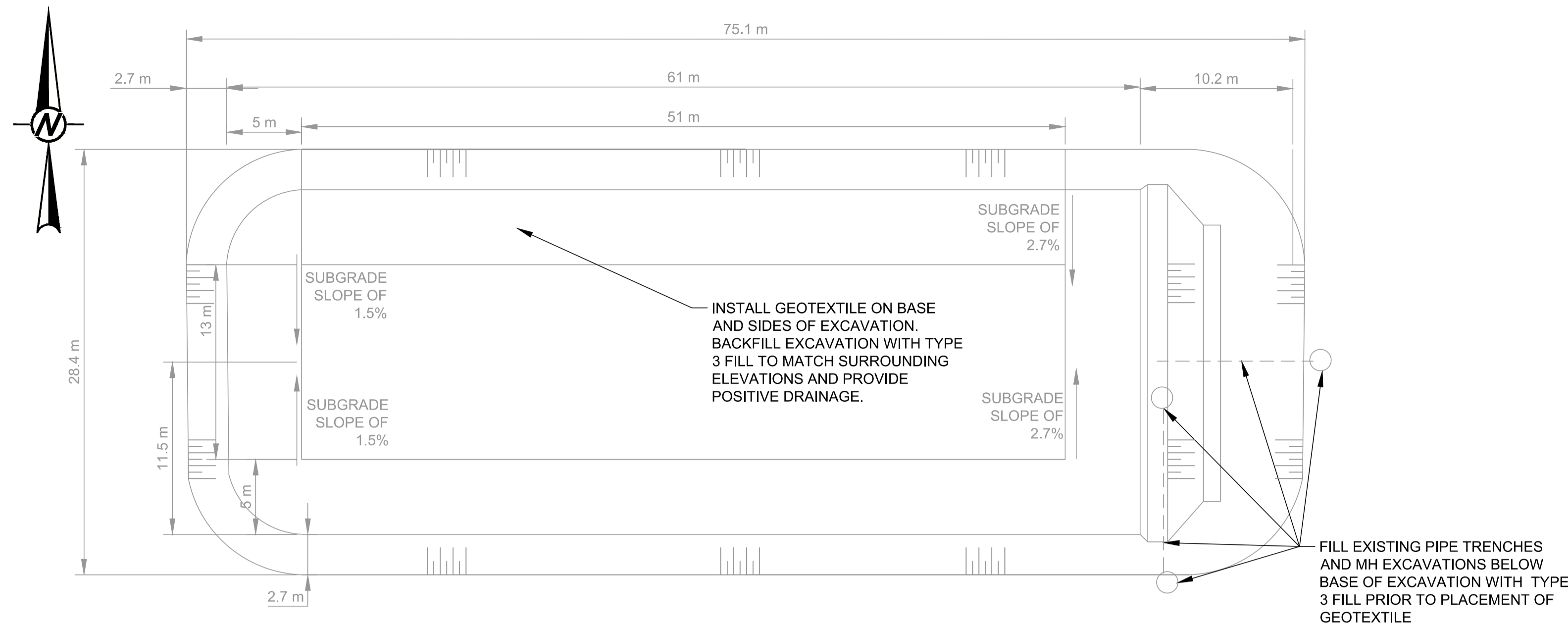
- A Detail No. No. du détail
- B drawing no. - where detail required dessin no. - où détail exigé
- C drawing no. - where detailed dessin no. - où détaillé

project title
 titre du projet
 Ontario
 PUBLIC SERVICES AND PROCUREMENT CANADA
 FTA REMEDIATION DESIGN
 THUNDER BAY AIRPORT

drawing title
 titre du dessin
 SECTION C (PHASES 2 TO 5)

drawn by dessiné par	ABD	project manager administrateur de projets
designed by conçu par	SWT	
approved by approuvé par	TL	
bid submission soumission		
project date date du projet	2020-02-14	
project no. no. du projet	R.106042.001	
drawing no. dessiné no.	C04	





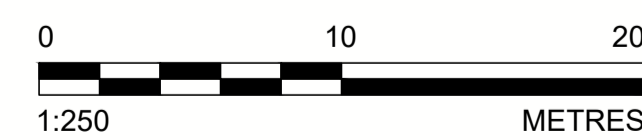
KEY PLAN



SCALE 1:50,000

REFERENCE(S)

1. EXISTING INFORMATION SUPPLIED BY CANTEC DESIGN-DRAFTING SERVICE, PROJECT # 785180, JULY 1991



04		
03	99% SUBMISSION	2020-03-27
02	66% SUBMISSION	2020-02-14
01	33% SUBMISSION	2020-01-10
revision		date

Do not scale drawings. Verify all dimensions and conditions on site and immediately notify the Departmental Representative of all discrepancies.

A	Detail No.
B	No. du détail
C	drawing no. - where detail required dessin no. - où détail exigé
	drawing no. - where detailed dessin no. - où détaillé

project title
titre du projet
Ontario
PUBLIC SERVICES AND PROCUREMENT CANADA
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT
drawing title
titre du dessin
REINSTATEMENT PLAN
(PHASE 6)

drawn by
dessiné par
ABD

designed by
conçue par
SWT

approved by
approuvé par
TL

bid
soumission
project manager
administrateur de projets

project date
date du projet
2020-02-14

project no.
no. du projet
R.106042.001

drawing no.
dessiné no.
C05



APPENDIX A
DOCUMENTS FOR INFORMATION

A.1

Select Text from the Limited RAP

TECHNICAL MEMORANDUM**DATE** 18 February 2020**Project No.** 19126451 /04**TO** Mr. Martin Bouwma
Public Service and Procurement Canada**FROM** Tony Lyon, PEng
Stefano Marconetto, PEng**EMAIL** TLyon@golder.com**SELECT TEXT FROM THE LIMITED REMEDIAL ACTION PLAN, FIREFIGHTING TRAINING AREA
THUNDER BAY INTERNATIONAL AIRPORT****Remedial Objective**

The objective of the remediation is to address the impacted materials present within the FTA to prevent additional contaminant release to the site.

Material and Infrastructure to be Removed and/or Decommissioned

The volume and type of material as well as the infrastructure located in the FTA were determined based on site measurements and the review of the construction drawings entitled "*Containment Basin Plan and Sections; Thunder Bay Ontario Fire Training Area*" prepared by Can-Tec Design Drafting Service, dated July 1991 and the operation instructions entitled "*Thunder Bay Airport, Fire Training Area – Containment Basin, Operating Instructions*," prepared by Buildings and Air Transportation Architectural and Engineering Services, Public Works Canada, Winnipeg, Canada, dated March 1994.

Based on the construction drawings and the measurements collected at part of the 2018 environmental monitoring investigation, the FTA consists of approximately 1,100 m³ of solids. This includes approximately 650 m³ above the primary liner - consisting of sludge, a granular base, a sand layer and the primary clay liner - and approximately 500 m³ beneath the primary liner – consisting of a sand layer, the secondary liner and a sand layer base beneath the secondary liner (refer to Figure 3).

A 150 mm diameter, corrugated metal sub-drain is located within the top granular base and sand layer (the blue pipe on Figures 2, 3 and 4). This pipe extends in both the containment basin (perforated pipe) and foam pit (solid pipe) and can drain water to manhole (MH) #1 through two valves located in the manhole. MH #1 is a concrete, circular manhole located between the containment basin and the foam pit. MH #1 is connected to collection MH #2 by two ductile iron pipes (diameter of 200 and 250 mm) located at different elevations to allow for either partial or complete draining of liquids from the containment basin and/or foam pit (the yellow pipes on Figures 2, 3, and 4). MH #2 is a concrete, circular manhole located directly outside the berm, south of the FTA, and can be used as pump-out manhole since it is more accessible by pump trucks. A sub-drain monitoring pipe is located in the sand between the two liners to collect liquid that passed through the top liner. This 100 mm diameter, perforated, plastic sub-drain extends over the entire length of the FTA and discharges to monitoring MH #3 (purple pipe on Figures 2, 3, and 4). MN #3 is a concrete, circular manhole located outside the berm, east of the FTA, and is used to monitor the presence of liquid between the liners. There is also a manhole located in the middle of the containment basin, southwest of the fuselage mock-up, which houses the capped ends (with threaded plugs) of the 150 mm diameter sub-drain collection pipe and the 100 mm diameter sub-drain monitoring pipe (Figure 2).

Four underground fuel lines deliver fuel from the fuel storage and pumping area to the southwestern side of the FTA. From there, the fuel lines extend longitudinally along the mock-up fuselage within the FTA and are equipped with 24 nozzles (Figure 1).

The water volume contained in the FTA has varied in the past measurements conducted by Golder. During the 2018 monitoring program (conducted in October and November 2018), the water volume in the FTA was estimated to be approximately 700 m³ – which includes approximately 250 m³ of standing water in the containment area and foam pit, an estimated 250 m³ in the FTA above the primary liner, and an estimated 200 m³ beneath the primary liner to the bottom of the sand layer underlying the secondary liner. However, during the 2019 monitoring program (conducted in August 2019), the water level in the foam pit and containment area were lower, as no standing water was present in the containment area and the depth of the standing water in the foam pit was approximately 1/3 of the depth measured in 2018 (0.30 m in 2019, compared to 0.95 m in 2018). Based on the 2019 measurements, approximately 25 m³ of standing water was present in the FTA, for an estimated total of approximately 475 m³ of water. To estimate the volume of water in the granular material and sand, a porosity of 0.4 was assumed, and it was assumed that the entire subsurface was saturated, which may result in a conservative estimate of water volume. For the purposes of this report, 700 m³ were used to estimate costs as volume of liquid could vary based on the time of year and potential use of the facility. To minimize the water volume, it is recommended to conduct the remediation between mid-July and the end of August.

In the foam pit, concentrations of perfluorooctanesulfonic acid (PFOS) were generally found to be the highest concentrations of the analyzed Per- and Polyfluoroalkyl Substances (PFAS). The PFOS concentrations in sludge ranged from 39 mg/kg (in 2018) to 390 mg/kg (in 2013). Water concentrations ranged from 970 ug/L (in 2018) to 1,900 ug/L (in 2013). The limited RAP assumes that all the liquid and solid material present within the FTA structure (including in manholes and pipes) are impacted and need to be addressed.

Description of Remedial Work

This section provides a summary of the scope of work and sequence of main operations for the remediation. There is significant space at the site for access and storage of materials. Potential locations for access, lay-down and/or storage areas are presented on Figure 5, the exact locations will be identified after consultation with the Airport Authority at the time of developing technical specifications.

- 1) Mobilization, utility locates and site preparation – Activities will include the completion of an updated survey of underground utilities as well as the layout of access, lay-down and storage areas. Installation of a liner and/or containment system in the work area adjacent to the FTA as well as the installation of secondary containment for liquid storage will be installed if required (refer to tasks below).
- 2) Decommissioning of fuel lines – The fuel lines will be drained and capped at the point of entry to the FTA. The portion of the fuel lines extending within the FTA will be removed during the tasks below. The fuel lines will also be capped near the filling point to minimize the potential of filling the fuel lines in the future. The exact location of the cap will be verified with TC and the Thunder Bay International Airport Authority. Fuel drained from the lines will be property of the contractor. The fuel can be reused, if the contractor deems appropriate, or disposed in accordance with local regulations.
- 3) Removal of standing water from the FTA (if necessary) - Removal of water from the foam pit will be conducted first since it contains the highest PFAS concentrations. It will be followed by removal of water from the containment area. Water can be removed by pumping from MH #2 if the pumping flow rate can be easily adjusted to match or exceed the flow rate of water discharging to MH #2. Alternatives include pumping directly from the foam pit and containment basin or from MH #1 with subsequent draining of the pipes leading to MH#1 and connecting MH #1 and MH #2.

- a. All the water should be pumped directly into the containers used for the hazardous waste transport and incineration. Containers should be securely sealed and stored in a designed area protected from traffic and other site activities. The contractor will be responsible for ensuring that processes are followed to minimize the potential for leaks and spills. This may include secondary containment depending on the container used and duration of on-site storage. Ultimately, the contractor will be responsible for remediating any areas which are impacted due to leaks or spills. Material will be removed from site prior to demobilization and must be removed prior to freezing conditions.
 - b. Once standing water from the FTA is removed, a tarp should be used to cover the FTA during off-work periods to prevent significant water accumulation in case of precipitation events.
- 4) Inspection of the mock-up fuselage and removal of any standing water potentially entrapped in the structure – The mock-up fuselage will be closely inspected before its removal to document the absence of standing liquid that could drain during the fuselage relocation. Any liquid will be handled as hazardous waste. Fuel lines within the FTA will also be removed at this stage.
- 5) Removal of the mock-up fuselage for recycling – This task can be potentially conducted concurrently with the water pumping from MH #3 described below.
- a. The steel recycler will cut the mock fuselage into appropriate sizes for transport, collect the pieces and then transport them to a steel plant where they will be melted as scrap steel. Note that the burner temperature for steel makers is >1,500 C and should provide destruction of PFAS.
 - b. Once removed from the FTA, the fuselage will be covered to minimize any contact with rain and limit the potential for leachate generation. Once it arrives at the steel plant, it will be either melted in a timely manner or stored indoors to further limit the potential for leachate generation.
 - c. PPE measures will be implemented to limit potential contact and exposure to the fuselage until it is melted (i.e., gloves to avoid direct contact).

A handling and transportation protocol will be developed and discussed with the steel recycler to confirm that this option is suitable. Alternatively, the fuselage will need to be disposed as hazardous waste.

- 6) Removal of water present between the two liners and in the monitoring sub-drain - Water will be removed by pumping from MH #3 until the system is fully dewatered. Water will be handled as per Task 3 above.
- 7) Excavation of the sludge, granular material and pipes located above the top liner – Excavation equipment will be used to remove the solid materials present above the top liner, allowing approximately 100 mm of material to remain above the liner as protection for the liner. While the top liner is known to be compromised, protecting it from further damage at this stage will allow it to at least partially limit the potential for impacted material to spread downwards during subsequent stages of excavation. Dewatering of the material will be conducted by digging sumps within the FTA or by gravity dewatering, if required. The excavation will proceed from the centre of the FTA outwards so that the containment berms can be used to contain solids and liquid inside the facility. The materials will be stored in containers supplied by or as per direction of the contractor responsible for hazardous solid waste transport and disposal. Any water encountered during excavation will be handled as hazardous waste liquid as per above protocols. Excavation will be performed in a way to minimize damage to the primary liner so that potential liquid accumulating in certain areas above the liner could be efficiently removed.

- 8) Excavation of primary liner as well as granular material and pipes located between the two liners – Excavation will proceed with the removal of the primary liner and all the material contained between the two liners allowing approximately 100 mm of material to remain above the secondary liner as protection. While the condition of the secondary liner is unknown, protecting the secondary liner at this stage will at least partially limit the potential for impacted material to spread downwards during subsequent excavation. Excavation will be performed in a way to minimize damage to the secondary liner so that potential liquid accumulating in certain areas above the liner could be efficiently removed. The berms of the FTA will still be left intact to aid with the containment of impacted solids and liquid.
- 9) Excavation of secondary liner, berms and the non-native granular material located beneath the liner (i.e., above native material during construction of the FTA) – The secondary liner, perimeter berms of the FTA and sand fill underlying the secondary liner will be excavated and the material handled as hazardous waste. Any water encountered during excavation will be handled as hazardous waste liquid as per above protocols.
- 10) Excavation of manholes – The four manholes and any remaining associated piping will be excavated and disposed of as hazardous waste as PFAS has likely sorbed to these materials. Any liquid will be collected and handled as hazardous waste before proceeding with the removal of the infrastructure. Metals encountered during excavation which would be suitable for steel recycling and can be cleared of soil without using a liquid solution, should be recycled following the procedure as outlined in Task 5 above.
- 11) Soil sampling and backfilling – Soil samples of the native material underlying the sand fill will be collected and submitted for PFAS, PHC F1-F4 and BTEX analyses to assist with the site management strategy for the impacted soil present at the site beyond the limits of the FTA.
- 12) Geotextile installation and backfilling – A geotextile will be installed along the bottom and sides of the excavation before the area is backfilled with clean fill. The purpose of the geotextile is to separate the native soil from the backfill in case future excavation of the native soil is required (i.e., the purpose of the geotextile is to form a visual barrier between clean imported backfill and potentially contaminated native material, not to act as a liner to contain contamination).
- 13) Demobilization – Upon completion of the scope of work, all equipment will be removed from site.

Conclusions

The following options have been selected to address the impacted materials present within the FTA to prevent additional contaminant release to the site:

- Excavation, trucking and disposal of the solid material within the FTA to a facility licensed to accept hazardous waste;
- Pumping, trucking and disposal of the liquid within the FTA to an approved facility for incineration;
- Recycling of the fuselage via a steel recycler that would melt the material in a high-temperature arc furnace or equivalent equipment. This option requires the development and acceptance by all parties of handling procedures to minimize liability during the handling of the fuselage prior to it being melted. Disposal of the fuselage as hazardous waste will be considered should these discussions fail.

The limited RAP provided herein was conducted independently of the broader risk management strategy being implemented to address impacted environmental media elsewhere at the site. Design drawings and technical specifications will be developed based on the remediation scope of work presented in the RAP.

Limitations

This report was prepared for the exclusive use of Public Works and Government Services Canada (PWGSC) and Transport Canada (TC). The report is based on data and information collected during the various investigations completed in 2013, 2015, 2016, 2017, and 2018, and is based solely on the conditions of the property at the time of conducting investigations.

The assessment of environmental conditions at this site has been made using the results of field screening techniques and chemical analysis of sediment (sludge) and surface water at a limited number of locations. The site conditions have been inferred based on conditions observed at the sampling locations. Conditions may vary from these sample locations. Additional study, including further investigation, can reduce the inherent uncertainties associated with this type of study. However, it is never possible, even with exhaustive sampling and testing, to dismiss the possibility that part of a site may be contaminated and remain undetected.

The services performed as described in this report were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The content of this report is based on information collected during the sediment and surface water sampling activities from within the FTA, our present understanding of the site conditions, and our professional judgement in light of such information at the time of this report. This report provides a professional opinion and therefore no warranty is expressed, implied, or made as to the conclusions, advice and recommendations offered in this report. This report does not provide a legal opinion regarding compliance with applicable laws. With respect to regulatory compliance issues, it should be noted that regulatory statutes and the interpretation of regulatory statutes are subject to change.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

Closure

We trust this report meets your current needs. If you have any questions regarding this report, please contact the undersigned.



Tony Lyon, PEng
Environmental Engineer

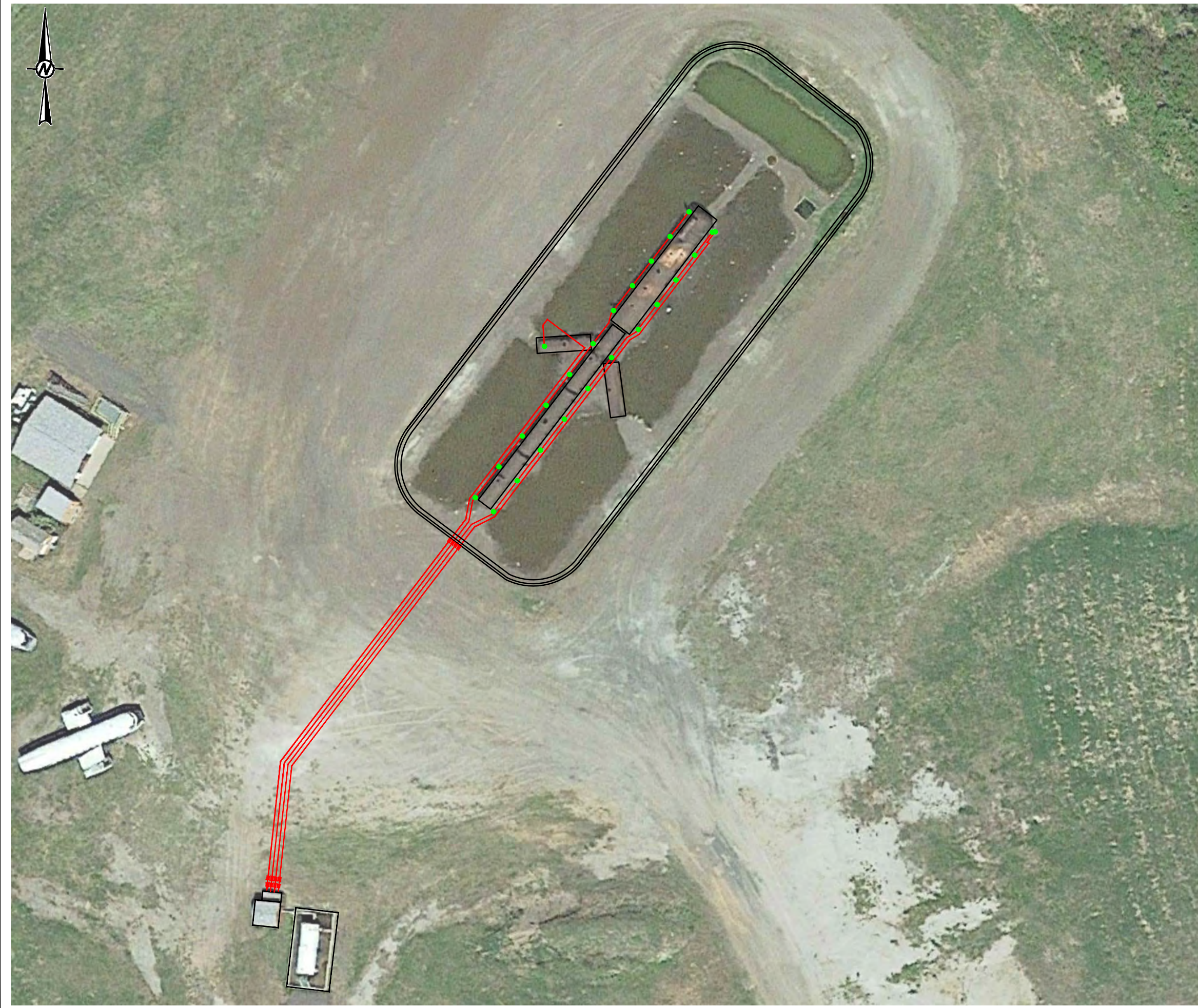


Stefano Marconetto, PEng
Associate, Environmental Engineer

TL/SM/ha

[https://golderassociates.sharepoint.com/sites/111909/project files/6 tbay rem deliverables/06. specifications/rap - select text/19126451-tm-rap - select text.docx](https://golderassociates.sharepoint.com/sites/111909/project%20files/6%20tbay%20rem%20deliverables/06.%20specifications/rap%20-%20select%20text/19126451-tm-rap%20-%20select%20text.docx)

Attachments: Figure 1: Site Plan with Fuel Lines and FTA
 Figure 2: FTA Plan with Piping System and Associated Manholes
 Figure 3: Typical Section Showing Liners, Soil Types and Piping
 Figure 4: Cross-Sections with Pipes
 Figure 5: Site Access and Laydown Areas



- LEGEND**
- NOZZLE FOR FUEL LINE
 - FUEL LINES RUNNING FROM THE FUEL STORAGE AREA TO THE FTA MOCK-UP FUSELAGE



CLIENT
PUBLIC SERVICES AND PROCUREMENT CANADA

PROJECT
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT, ONTARIO

TITLE
SITE PLAN WITH FUEL LINES AND FTA

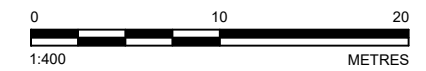
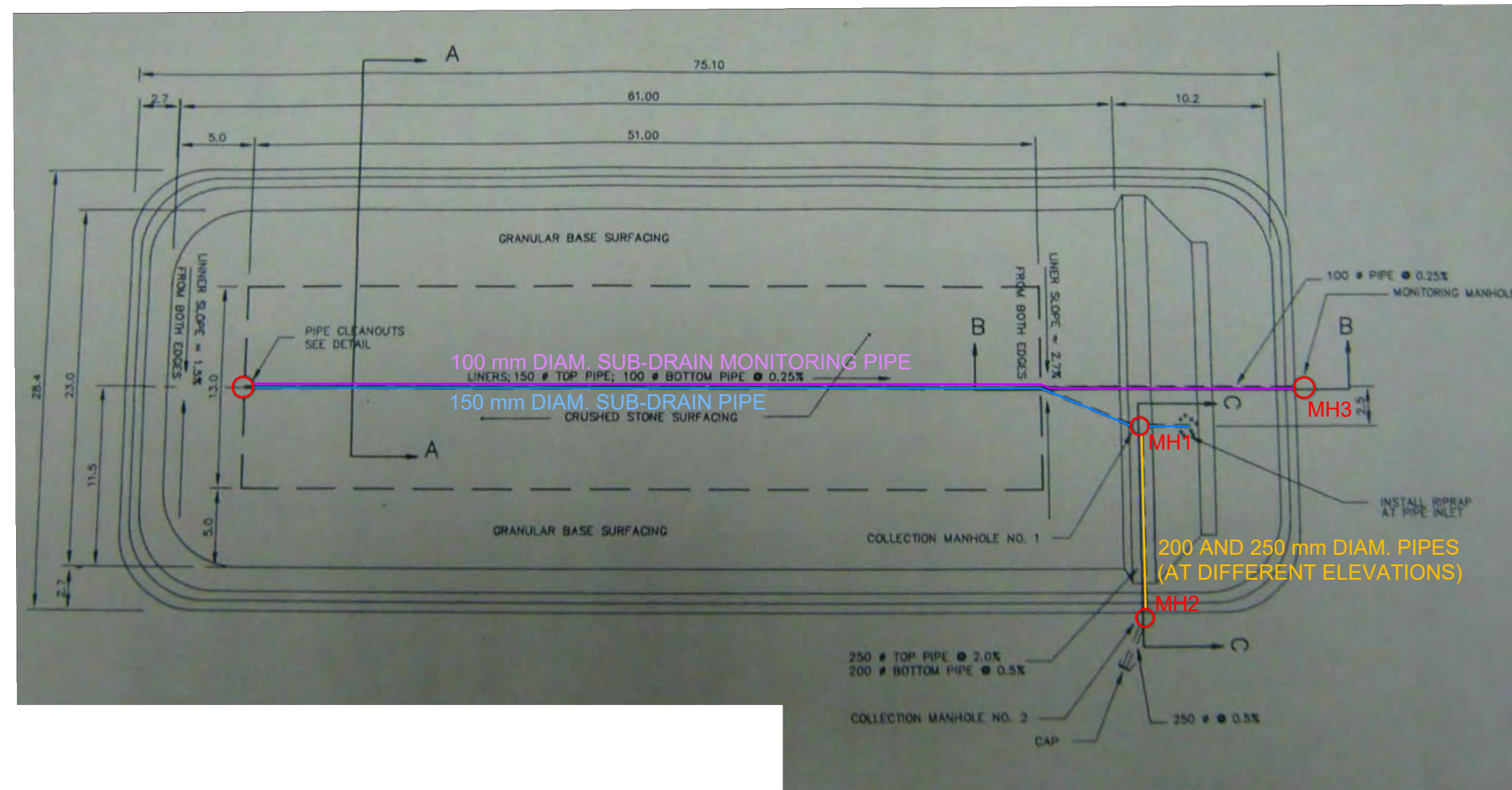
CONSULTANT	YYYY-MM-DD	2019-12-04
	DESIGNED	---
	PREPARED	JEM
	REVIEWED	TL
	APPROVED	SM

PROJECT NO. 19126451	CONTROL 0003	REV. 0	FIGURE 1
-------------------------	-----------------	-----------	-------------

Path: \\golder\golder\active\spatial\m\transport\Canada\ThunderBay\Airport_FFTA000_PRC0119126451_PSPC_Remediation\0003_BA01_1 File Name: 19126451_0003_MIS_2001.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM A3/B

Path: \\golder\golder\active\spatial\m\transport\canada\thunderbay\report\fta\09_PRCO\19126451_PSPC_Remediation\003_PAP1 File Name: 19126451-0003-MS-2001.dwg



CLIENT
PUBLIC SERVICES AND PROCUREMENT CANADA

PROJECT
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT, ONTARIO

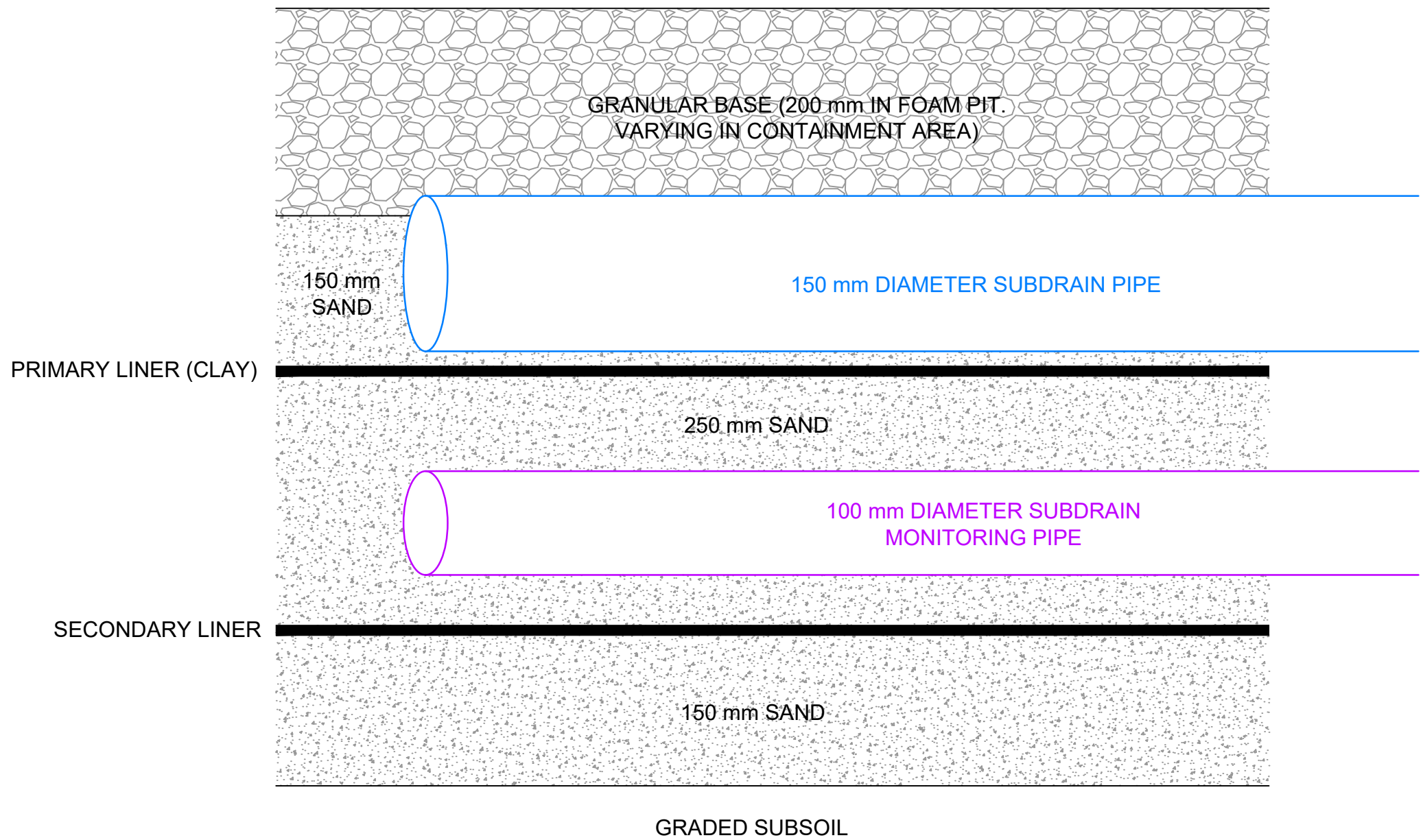
TITLE
FTA PLAN VIEW WITH PIPING SYSTEM AND ASSOCIATED
MANHOLES

CONSULTANT	YYYY-MM-DD	2019-12-04
DESIGNED	---	
PREPARED	JEM	
REVIEWED	TL	
APPROVED	SM	

PROJECT NO. 19126451 CONTROL 0003 REV. 0 FIGURE 2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB

Path: \\golder\golder\active\spatial\m\transport\canada\thunderbay\airport_fft\19126451_PSPC_Remediation\003_BA\1 File Name: 19126451_0003_HS_2001.dwg



CLIENT
PUBLIC SERVICES AND PROCUREMENT CANADA

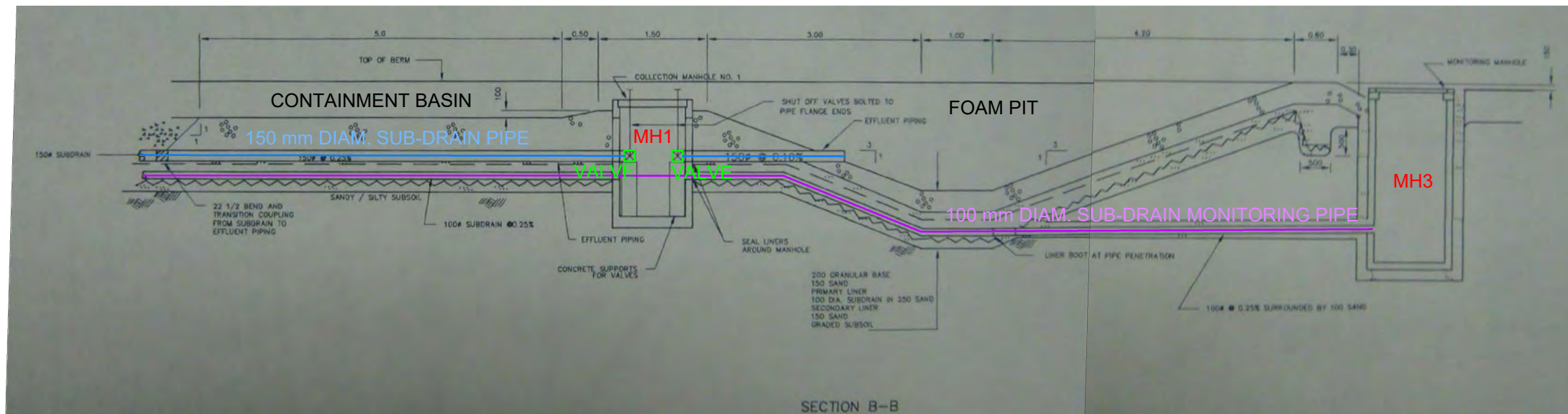
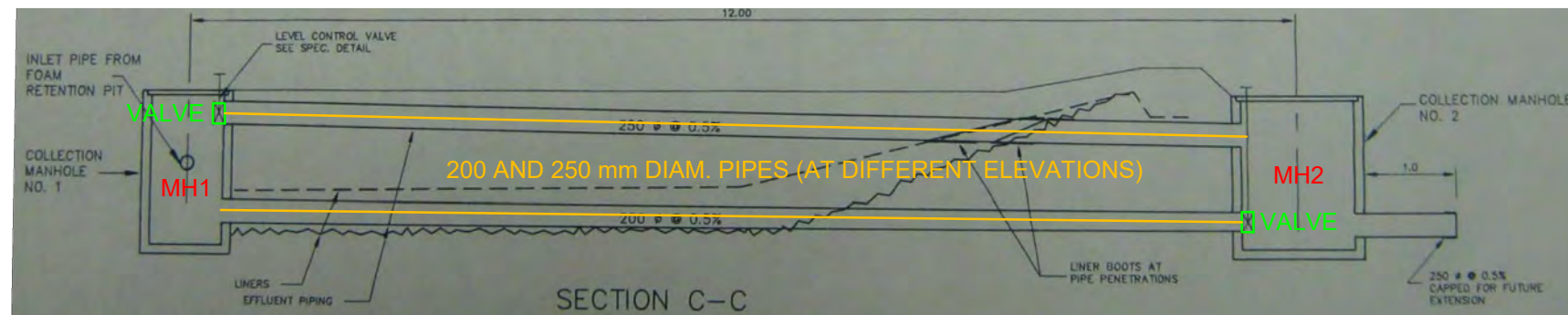
PROJECT
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT, ONTARIO

TITLE
TYPICAL SECTION SHOWING LINERS, SOIL TYPES AND PIPING

CONSULTANT	YYYY-MM-DD	2019-12-04
DESIGNED	---	
PREPARED	JEM	
REVIEWED	TL	
APPROVED	SM	

PROJECT NO. 19126451 CONTROL 0003 REV. 0 FIGURE 3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSIB 25 mm



CLIENT
PUBLIC SERVICES AND PROCUREMENT CANADA

PROJECT
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT, ONTARIO

TITLE
CROSS-SECTIONS WITH PIPES

CONSULTANT	YYYY-MM-DD	2019-12-04
DESIGNED	---	
PREPARED	JEM	
REVIEWED	TL	
APPROVED	SM	

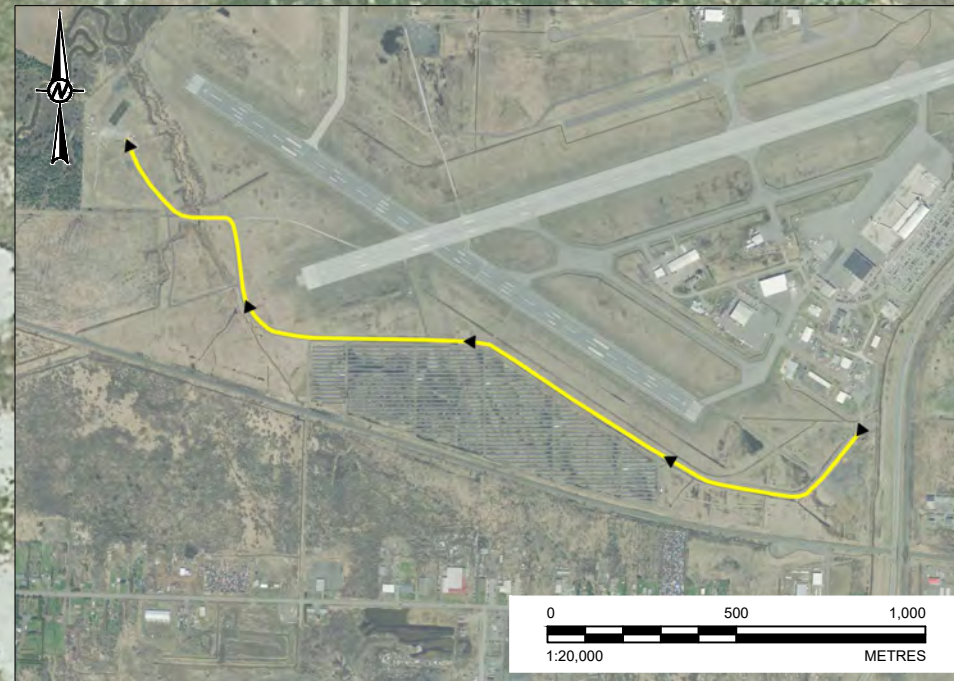
PROJECT NO. 19126451 CONTROL 0003 REV. 0 FIGURE 4



CONTRACTOR LAYDOWN AREA
AND AREA DESIGNATED FOR
HAZARDOUS WASTE TRANSPORT
AND INCINERATION CONTAINERS.

SITE ACCESS
ROUTE

LEGEND
SITE ACCESS



CLIENT
PUBLIC SERVICES AND PROCUREMENT CANADA

PROJECT
FTA REMEDIATION DESIGN
THUNDER BAY AIRPORT, ONTARIO

TITLE
SITE ACCESS AND LAYDOWN AREAS

CONSULTANT	YYYY-MM-DD	2020-02-03
	DESIGNED	---
	PREPARED	JEM
	REVIEWED	TL
	APPROVED	SM

PROJECT NO. 19126451	CONTROL 0003	REV. 0	FIGURE 5
-------------------------	-----------------	-----------	-------------

APPENDIX B
PERMIT APPLICATION FORMS

B.1

TBIAAI Facility Alteration Permit



Facility Alteration Permit (FAP)

Facilities and Airfield Management
 Thunder Bay International Airport Authority
 E-mail: tj.ahvenniemi@tbairport.on.ca
 Phone: (807) 473-2600

TBIAAI Office use only

Reviewed by: _____
 Review date: _____
 Approved: _____ Not approved: _____
 Reason: _____
 Follow up date: _____

No work will be authorized without a TBIAAI approved FAP. This form must be completed in full and submitted to the TBIAAI for approval. Visit our web page for more information. <http://www.tbairport.on.ca/page/facility-alteration-permit>

A – PROJECT Description			
Project Title:			
Project Location & Scope: (Be as accurate as possible. Use map/drawing if necessary. Please use separate sheet if more space is required.)			
The infrastructure being worked on is:	Leased from Thunder Bay Airports Authority	Owned by the Company indicated as "Owner" on this application	
Designated Project Representative:	Project Initiator (Sec.B) <input type="checkbox"/>	Applicant (Sec. C) <input type="checkbox"/>	Contractor (Sec. D) <input type="checkbox"/>
Has your TBIAAI's Leasing Representative been notified of this project?		no	If yes, who?
B – PROJECT INITIATOR	<input type="checkbox"/> TBIAAI	<input type="checkbox"/> Tenant	<input type="checkbox"/> Other
Company Name:			
Billing Address:			
Project Initiator:		Title:	
Phone:		E-mail:	
C – FAP APPLICANT	<input type="checkbox"/> Check if same as Section B		<input type="checkbox"/> Authorized Agent
Company Name:			
Billing Address:			
Contact Name:		Title:	
Phone:		E-mail:	



Facility Alteration Permit (FAP)

Facilities and Airfield Management
 Thunder Bay International Airport Authority
 E-mail: tj.ahvenniemi@tbairport.on.ca
 Phone: (807) 473-2600

D – CONTRACTOR INFORMATION Has this contractor worked at the TBIAA site before? **yes** **no**

Contractor Name:	
Billing Address:	
Contact Name:	Title:
Phone:	E-mail:
Describe previous work this contractor has done at the airport:	Project Emergency 24/7 Contact Phone Number:

E – POTENTIAL OPERATIONAL IMPACTS

Excavation or Drilling <input type="checkbox"/> <i>*May require locates</i>	Electrical <input type="checkbox"/>	Barriers <input type="checkbox"/>	Hot Works (welding, torching, etc.) <input type="checkbox"/>
Crane / boom height considerations * May require a NavCanada Land Use Application Submission <input type="checkbox"/>	Passenger Flow Disruptions <input type="checkbox"/>	Traffic Flow Disruptions <input type="checkbox"/>	Physical changes to ATB (walls,plumbing, etc.) <input type="checkbox"/>
<input type="checkbox"/> Provide a description of the above impacts specific to your scope of work:			

F – UTILITIES

Will you be connecting to any of the following TBIAAI owned utilities or building systems? Check all that may apply.

Domestic potable water	Sanitary Sewer	Security
Electrical	Storm Sewer (open ditch or underground)	HVAC
Sprinkler/Fire Suppression	Data/communications	Non-potable water
Alarm	Natural Gas	Other

Anticipated Hazards (to be completed by requester)	Associated Controls (to be completed by the requester)

TBIAAI Notes: *project may be subject to the following conditions or limitations.*

Projects involving cranes, booms, or any other object that may protrude above prescribed allowable heights in the airfield and any excavation or drilling that requires locates MUST be cleared through TBIAAI prior to commencing operations. Failures to provide such notification will be subject to an immediate shutdown and potentially significant project delays.

B.2

Transport Canada Plan of Construction Operations

Guideline for Plan of Construction Operations (PCO)

Plan of Construction Operations (PCO)

Airport: _____

Project: _____

Start Date: _____ Finish Date: _____

Originator: Name: _____

Company _____

Phone _____

FAX _____

E-mail _____

Project Contacts:

Airport Operator: _____

Phone _____ FAX _____

E-mail _____

Other Contact: _____ Title _____

Phone _____ FAX _____

E-mail _____

Guideline for Plan of Construction Operations (PCO)

◆ Description of the construction project:

(Provide a full description of the planned construction project)

◆ Stages/phases of the construction & schedules:

(List the different stages of the construction activities with anticipated start and finish dates)

◆ Types & frequency of air traffic:

(List the types of aircraft and number of daily movements anticipated during the construction period)

◆ Disruptions to air traffic:

(What will be the impact on and disruptions to the air traffic as listed above.)

◆ Position and height of equipment (relative to runways & taxiways):

(Provide the location and maximum working height of the construction equipment or vehicles and where that equipment will be working in relationship to the taxiway or runway edges/ends. This information is required to assess the impact on Obstacle Limitation Surfaces.)

◆ Work on runway strips and adjacent to taxiways:

(Refer to green pages in the back of TP 312E - Aerodrome Standards & Recommended Practices, Attachment A, page 5, temporary hazards on runway strips. Which zone will you be working in, what restrictions and operational conditions will apply to your project? Include a statement that work and temporary hazards on the runway strip will comply with TP312, Attachment A, Section 5.3)

◆ Unserviceability markings, barriers and lighting provided:

(Refer to TP312, chapter 6.2 and 7.4.)

◆ Displaced and/or relocated thresholds:

(If the project will require a displaced or relocated threshold, provide an explanation as to why this is required, what percentage slope the calculations are based on, how will the new threshold be marked and lighted, what buffer is being provided for jet or prop blast, consideration.)

◆ Declared distance during all phases:

(Based on the above calculation what will be the revised declared distances.)

◆ Access control, vehicle operations and escorts:

(How will vehicles and equipment access the construction site, will AVOP's be issued, are radio licences required, will vehicles be escorted, whom will be providing the escorts,)

◆ Communications plan (prior to construction and during construction):

(Every construction project requires a Communication Plan. The Plan will cover communication with the airport's clients/users, Nav Canada and Transport Canada during all phases of the project; #1: Planning Phase, #2: Pre-construction Phase #3: Construction Phase.)

Guideline for Plan of Construction Operations (PCO)

Airport Ops ↔ ATC:
ATC ↔ Construction Site:
Airport Ops ↔ Construction Site:
Airport Ops ↔ Users (Stakeholders):
Airport Ops ↔ Transport Canada

◆ NOTAMs as per the NOTAM procedure manual:

(Provide a draft of all anticipated NOTAMS. Notams revising declared distances must be pre approved by Transport Canada)

◆ Drawing or Blueprints:

(Provide any drawings required to support your Plan of Construction Operation. It is the airport operator's responsibility to ensure the drawings and final product meet Aerodrome Certification requirements, CARs 302 and TP312 4th edition)

◆ Amendments to publications and the Airport Operations Manual

(Identify what amendments will need to be made to aeronautical publications and to the AOM)

◆ Safety Management Systems

(Include applicable SMS requirements and procedures including airport operator personnel and contractor obligations to report hazards and incidents; non-punitive reporting; proactive and reactive procedures; etc.)

Guideline for Plan of Construction Operations (PCO)

For consideration while preparing a PCO:

- *Location of equipment under approach and transitional surfaces*
- *The height of obstacles & distance from the threshold and runway edge*
- *Relocation or displacement of threshold*
- *Revised TORA, TODA, ASDA, LDA*
- *Declared clearway available*
- *Marking of relocated or displaced threshold*
- *Operation of visual aids when the threshold is relocated or displaced*
- *Is the PAPI off when the threshold is relocated or displaced*
- *Coordination with airport & FSS for turning off lighting*
- *Work in zones 1,2 & 3 in accordance with TP312, attachment A, Section 5.3*
- *Work adjacent to taxiways & aprons*
- *Interference with any electronic nav aids, such as a localizer when in any/all of the zones.*
- *Size of trenches*
- *Trenching & backfilling*
- *Procedures to reopen full length when requested, emergency or weather limits are down.*
- *Inspection checks before reopening areas*
- *Lighting of runway during closures.*
- *Closed markings on new runway during construction, & before relocation of lighting*
- *Barricades lighting & markings at threshold, denoting construction area.*
- *Spacing & colours*
- *Barriers & lighting adjacent to trenches*
- *NOTAM's*
- *Commissioning of nav aids & visual aids (when & by whom)*
- *AVOPS & Escorts*

Standards that may apply to the project:

➤ Breakdown of the stages/phases of the construction, and a schedule of activities

- 9.4.2.15, TP 312: The longitudinal slope of the temporary ramp shall not exceed 1.0% (Rwy overlay)
- 9.4.2.18, TP 312: Before a rwy being overlaid is returned to a temporary operational status, a rwy c/l shall be provided. Additionally, the location of any temporary threshold shall be identified by a 3.6m transverse stripe.

➤ Marking and lighting change during construction.

- 7.1.2.1, TP 312: Lighting on a closed rwy, twy or portion thereof shall not be operated.
- 7.1.2.2, TP 312: In addition to closed markings, when the rwy, twy or portion thereof closed is intercepted by a usable rwy or twy which is used at night, Unserviceability lights shall be placed across the entrance at intervals not exceeding 3m.
- 7.4.1.1, TP 312: Unserviceability markers shall be displayed wherever any portion of a twy, apron or holding bay is unfit for the movement of a/c but it is still possible for a/c to bypass the area safely.
- 7.4.1.2, TP 312: Unserviceability markers shall be placed at intervals sufficiently close so as to delineate the unserviceable area.
- 7.4.2.1, TP 312: Unserviceability lights shall be displayed wherever any portion of a twy, apron or holding bay is unfit for the movement of a/c but it is still possible for a/c to bypass the area safely.

Guideline for Plan of Construction Operations (PCO)

- 7.4.2.2, TP 312: Unserviceability lights shall be placed at intervals sufficiently close so as to delineate the unserviceable area.

➤ **Work along sides of runway/taxiway must meet TP 312.**

- 8.6.1.1, TP 312: Unless its function requires it to be there for air navigation purposes, no equipment or installation shall be a) on a rwy strip, RESA, twy strip or within the distances specified in table 3-1, column 5, if it would endanger a/c.
- Attachment A: 5.3.1, TP 312: 3 zones alongside runway:
 - a. Zone 1: Code 1: 21m from rwy edge. Code 2, 3, 4: 23m from rwy edge.
 - b. Zone II: from edge of zone 1 to edge of graded area.
 - c. Zone III: applies only to N-P rwys used in conditions of low vis or cloud base. From the edge of the graded area to the edge of the strip.
- Attachment A: 5.3.2, TP 312: Procedures for zone I:
 - a. Precision approach: No work when the rwy is in use.
 - b. N-I & N-P: Work on only one side of the rwy at a time.
 - c. Obstacle not to exceed 9m² in area, but narrow trenches allowed up to 28 m².
 - d. Height of obstacle not to exceed 1m above the ground.
 - e. Trenches and other excavations should be backfilled and compacted ASAP.
 - f. No plant or vehicles should operate in this zone when the rwy is in use.
- Attachment A: 5.3.3, TP 312: Procedures for zone II:
 - a. Precision approach: No work when the rwy is in use.
 - b. N-I & N-P: Restrictions to be applied depend on the type of operations taking place and the weather conditions:
 - Dry rwy & 15 knot crosswind (Code 4), 10 Kt (Code 2 & 3):
 - Unrestricted areas of construction, with the length of excavation parallel to the rwy being kept to a minimum.
 - Overall height of materials limited to 2m above ground.
 - All construction equipment should be mobile and kept within normal height limits
 - VFR: Rwy may continue in use when an a/c is immobilized. IFR: Rwy closed when an a/c is immobilized.
- Attachment A: 5.3.4, TP 312: Procedures for zone III: No restrictions, however, ensure that work and vehicles do not interfere with radio navigation aids.

➤ **Access Control, Vehicle Operations and Communications:**

- 6.1.1.1, TP 312: Vehicles and other mobile objects on the manoeuvring area shall be marked, and if used at night, lighted.
- AVOP training and permission, Vehicle Escort Radio licenses
- Measures to prevent incursions and unauthorized entry

Guideline for Plan of Construction Operations (PCO)

APPROVAL OF PLAN OF CONSTRUCTION OPERATIONS

PROJECT:

AIRPORT NAME:

AIRPORT OPERATOR and CERTIFICATE HOLDER:

AIRPORT MANAGER:

CERTIFICATE NUMBER:

5151-C

DATE OF ISSUE:

I undertake to meet the obligations set out in this plan of construction; and I hereby certify that the information in this plan is complete and accurate and no relevant information has been omitted.

Date (Y-M-D)

Signature of Airport Operator/Certificate Holder

This Plan of Construction Operations Manual/Amendments is approved

Date (Y-M-D)

for Minister of Transport

Canada

Guideline for Plan of Construction Operations (PCO)

B.3

Nav Canada Land Use Proposal



Land Use Proposal Submission Form

NAV CANADA file N° / Ref N°	Transport Canada File N° / Ref N°
-----------------------------	-----------------------------------

GENERAL INFORMATION:

Company/Owner Name:		Contact Person:	
Address:		City:	Postal Code:
Tel:	Cell:	Email:	
Applicant:		Contact Person:	
Address:		City:	Postal Code:
Tel:	Cell:	Email:	

DETAILS OF PROPOSAL:

- Please provide the data in the highest resolution as it was obtained.
- For geographic coordinates, provide up to four (4) decimal places of a second.
- For ground elevation and tower height, provide up to four (4) decimal places of a metre or foot.

Project Identification:	Nearest Town:
Street Address, etc.:	Province:

Geographic Coordinates of Site in NAD 83: Degrees Minutes Seconds Degrees Minutes Seconds
 Lat. N / / Long. W / /

For submissions containing more than one location, please complete the [Multiple Obstacle Template](#) and return in Excel format. (Examples: Linear Structures, Wind Farms, Building Corner Coordinates, Multiple Cranes, etc.)

Type of Structure:	New Structure? <input type="checkbox"/> Yes <input type="checkbox"/> No	Height Added (If Existing)	<input type="checkbox"/> ft <input type="checkbox"/> m
Cranes to be used? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes: Crane details shall be submitted separately if not included with this form.	Ground Elevation (Above Sea Level)		<input type="checkbox"/> ft <input type="checkbox"/> m
Dimensions:	Structure Height (Above Ground Level) Including all appurtenances		<input type="checkbox"/> ft <input type="checkbox"/> m
Materials & Roof Shape (If Building):	Total Height (Above Sea Level) Structure Height + Ground Elevation		<input type="checkbox"/> ft <input type="checkbox"/> m
Proposed Construction Start Date:	Approximate Duration of Construction:		
If Temporary Structure, indicate Removal Date:	From: hrs	To: hrs	

Comments:

Known co-location with/on NAV CANADA Site: YES/ NO

A Third-Party Submission Form may be required for complex applications, fee applicable.

ELECTRONIC / TELECOMMUNICATION INTERFERENCE (Check off the items that may cause interference and provide details)

High Voltage Equipment Details

Arc Welding Details

Radar Emission Details

High Powered Transmissions Details

VHF Radio Details

Other Details

OBSTRUCTION TO VISION ON AIRPORT WITH NAV CANADA SERVICES/CONTROL TOWER, FSS, CARS:

Check the items that may cause obstructions to vision to the installation:

Line of Sight Details

Generation of Smoke/Vapour Details

Reflectivity Details

Aircraft Parking Details

Exterior Lighting Details

Applicant/Representative Signature

Print Name

Date

Acknowledgement of reading [Proponent Education Package](#) (Submitter's Initials)

For a detailed description on NAV CANADA's requirements and additional information, refer to the NAV CANADA website at www.navcanada.ca > PRODUCTS & SERVICES > [Land Use Program](#).

NAV CANADA's land use evaluation is valid for a period of 12 months. Our assessment is limited to the impact of the proposed physical structure on the air navigation system and installations; it neither constitutes nor replaces any approvals or permits required by Transport Canada, other Federal Government departments, Provincial or Municipal land use authorities or any other agency from which approval is required. Innovation, Science and Economic Development Canada addresses any spectrum management issues that may arise from your proposal and consults with NAV CANADA Engineering as deemed necessary.

Please submit by email to landuse@navcanada.ca

Processing Times

NAV CANADA will endeavour to provide a response within 8 to 12 weeks of receipt of the proposal. The accuracy and completeness of the initial documentation provided to NAV CANADA, and consequently the cooperation of the proponent to quickly rectify any deficiencies/inaccuracies will go far to expedite the process and ensure a timely response. Electronic submissions will also decrease the time required to properly assess a submission.

Distribution

Specific information submitted to NAV CANADA's Land Use department (that is, coordinates, structure heights and possibly owner's contact information) will be distributed externally. These external stakeholders include but are not limited to: Transport Canada, Aerodromes, NORAD, External Design Organizations (EDOs), Department of Defense (DND) and Environment and Climate Change Canada (ECCC) for review of services that they are responsible for and maintain.

Contact Us

NAV CANADA
Aeronautical Information Management
AIM Land Use Office
1601 Tom Roberts Ave
Ottawa, ON K1V 1E5

Website: www.navcanada.ca > PRODUCTS & SERVICES > [Land Use Program](#)

Toll Free: (866) 577-0247

Fax: (613) 248-4094

Email: landuse@navcanada.ca ****Preferred method for submission**

Obstruction Marking and Lighting

Transport Canada is required to perform an assessment on the requirement for obstruction marking and lighting of man-made structures per Canadian Aviation Regulations (CARs). Obstructions are assessed by Transport Canada through the Aeronautical Assessment Form Process. *Note: outages in obstruction lighting deemed a requirement by Transport Canada are to be reported to the appropriate NAV CANADA Flight Information Centre (FIC) as per CAR 601.28.*

Kamloops FIC 1-866-541-4101 Edmonton FIC 1-866-541-4102 Winnipeg FIC 1-866-541-4103

London FIC 1-866-541-4104 Quebec FIC 1-866-541-4105

Land Use Proposal Submission Form Instructions

This section provides additional instructions for each section of the Land Use Submission Form.

Applicant: If not the same as owner, the name of consultant, contractor, or other who is applying on behalf of the owner. Note: all correspondence will be forwarded to the applicant.

Approximate Duration of Construction: Specify time of operation for temporary structures of short duration. This may be required for NOTAMing purposes.

Arc Welding: If any construction taking place on your site requires arc welding, please complete this field. Specify the anticipated duration of arc welding. Welders can potentially interfere with the reliability of the ILS systems of an airport and must therefore be brought to our attention.

Blasting Operations: The following additional information will be required for blasting activities for a Land Use Assessment and possible NOTAM / publication action:

Blast Area: Geographic coordinates (latitude & longitude in NAD83) of the blasting area corners or centre coordinates with a blasting radius.

Blasting Times: specify period during the day (for example, daylight hours or 0800 to 1600 local time Monday to Friday, one-time event, etc.).

Duration of Operation: estimated amount of time (months/years) expected to operate at specified location.

Elevations: Highest ground elevation (above sea level) within blasting zone, maximum height of fly rock or debris (above ground level), and shockwave/overpressure height (above ground level, if applicable). Indicate use of blast mats (if applicable).

Topographical map: (1:50 000 scale) depicting the blasting area.

Company/Owner Name: Owner of the proposed structure or development.

Cranes: For construction projects (such as a new building, placement of roof top structures, flare stack, etc.) where a crane will be required and where the maximum operating height will be higher than the overall height of the proposed structure, the applicant is to provide details for both mobile and temporary cranes on a separate submission form **at least 30 working days in advance**. We ask that crane application(s) be cross referenced to the associated construction project and provide detailed crane specifications such as maximum height, boom length and swing radius. A drawing detailing the crane specifications and type would be beneficial, please reference the NAV CANADA Land Use Program web page for more details. *Note: A drawing showing the required specifications indicated below will be beneficial.*

Maximum Swing Radius: In a manner similar to a large structure, a crane with a large swing radius can create a severe horizontal angle with respect to Navigation/Communication/Surveillance equipment, thereby compromising coverage. The maximum swing radius shall be provided so we can properly assess the situation and determine whether or not the swing radius is within an acceptable level. *Note: maximum swing radius refers to the maximum that will be achieved during construction and not the maximum achievable swing of the crane (unless that specific setting is being used in the construction).*

Boom Length: This information is needed to determine the vertical angle of the crane with respect to any nearby NAV CANADA facilities.

Max Height Achieved During Construction: This information is needed to determine the worst-case scenario for vertical angles between the crane and nearby NAV CANADA facilities.

Date Received: Represents the date the application was received by NAV CANADA Land Use.

Details of Proposal: Project Number, Street address, etc.: A project name, number or street address that can be traced should the owner/applicant require follow-up status on a project.

Dimensions: Indicate structure design specifications. Certain equipment used by NAV CANADA (the radar equipment in particular) can potentially be disrupted by those structures which possess large horizontal dimensions. Such scenarios are assessed by determining the structure's horizontal angle with respect to the NAV CANADA site. For Cranes, include maximum height to which the crane will be raised, boom length and swing radius. A drawing with the specs is desired.

From / To:

Indicate the time of the day when the structure will be raised. For example: 08:00, 13:00

Indicate the time of the day when the structure will be lowered. For example: 11:00, 17:00

Geographic Coordinates: The geographic location in latitude and longitude of the proposed structure/development. Coordinates must be provided in degrees, minutes, and seconds for NOTAM and database updating purposes. It is an ICAO (International Civil Aviation Organization) requirement to provide accuracy to within 1/100th of a second. For example, N46° 06' 44.67" W064° 40' 43.25".

Geodetic Datum: Coordinates are to be provided in NAD83 only. NAD 27 or UTM coordinates must be converted into the required format; the following are Natural Resources Canada online transformation links (these may change without notice):

NAD 27/83 and Geographic/UTM conversions: <http://webapp.geod.nrcan.gc.ca/geod/tools-outils/ntv2.php?locale=en>

NAD 27/83 and Geographic/UTM conversions: <http://webapp.geod.nrcan.gc.ca/geod/tools-outils/trx.php>

Reference the [Natural Resources Canada webpage](#) for information on this topic.

Ground Elevation: Should be consistent with the contour interval details shown on the 1:50,000 topographical chart. *Note: GPS readings (when not surveyed) or Google Earth readings are not considered reliable information. Please refer to topographical maps containing contour information or surveyed data. Where ground elevation has been surveyed, the finished grade is to be provided.*

Height Added: The structure currently exists. Specify any increase in height due to an addition.

High Powered Transmission: Such transmissions include AM, FM, or television broadcast signals. Such equipment should typically be located at least 8 km from NAV CANADA facilities. However, any equipment at the proposed site which falls under this category must be mentioned here.

High Voltage Equipment: Any equipment which carries a voltage of at least 2 kV must be mentioned here as such equipment can create electrical interference with NAV CANADA's radar systems. Voltages over 100 kV are especially worthy of mention, as they will potentially interfere with, not only the radar systems, but the ILS systems as well.

Linear Group of Structures: Cable crossing, telephone or power line, should have a beginning and end point of the line. Should there be intersection points along the route, applicant to provide a spreadsheet containing the geographic coordinates and ground elevation.

Note: Groups of Structures (Linear or Non-Linear): Groups of structures that are sufficiently close together can disrupt line of sight radio frequency (RF) coverage in a manner similar to a single, large structure. Therefore, a drawing of the group's layout is required in order to determine its bearing with respect to a NAV CANADA facility. From here, a horizontal angle between the site and the group of structures can be determined in order to assess the risk of coverage shadowing. Note: this requirement will be in addition to the map requirements listed on page 2 of the Land Use Proposal Submission Form.

MAPS/DRAWINGS

1:50,000 topographical map 8.5"x11" sectional with the location of the proposed structure clearly marked. The map submission must contain a legend indicating the map datum (NAD27 or 83) and the contour interval: NAV CANADA will accept the equivalent to the topographical maps produced by Natural Resources Canada which can be obtained digitally (by various mapping software companies) or in paper copy at most map supply stores. This will allow the Land Use Office to confirm possible discrepancies between the location shown on the map and the ground and geographic coordinates provided on the form. It will assist us in referencing where the proposed structure is with respect to the nearest airport, as well as any nearby NAV CANADA sites, and to reference the structures location within an instrument procedure design to determine possible penetration of the obstacle limitation surface on published instrument flight procedures.

Site Plan Depicting Entire Airport and Location of proposed structures: In cases where the proposed structure is close to an airport, within 6 km, or on an airport with a localizer/ILS (Instrument Landing System) runway, it is important to determine where the structure is with respect to any ILS at the airport. For this reason, site plans should include the *entire airport* and have the airport zoomed in as close as possible while still showing the proposed site in its entirety.

Proposals adjacent within 2 km from an airport with FSS or Control Tower: Certain equipment used by NAV CANADA (the radar equipment in particular) can potentially be disrupted by structures that possess large horizontal dimensions. Such scenarios are assessed by determining the structure's horizontal angle with respect to the site in question. This angle cannot be determined unless all horizontal dimensions and orientation of the structure are provided as well as the structure's bearing (that is, the map should include a north arrow).

For localizer/ILS runways, site plan with distance bar at 1:2,000 scale measure distances based at 90° to nearest runway centerline/extended runway centerline, and distance to nearest runway threshold. *Note: reference TP 1247 to determine requirement when along an extended centerline of a localizer runway up to 6 km.*

Materials and Roof Shape: Indicate only the dominant materials of the structure, along with any metal which may exist. Indicate whether or not the roof (if applicable) of the structure is flat or sloped. *Note: Certain materials (such as metal) can cause undesirable reflections if they are sufficiently close to NAV CANADA equipment. Mentioning every material being used in the development is unnecessary, but metal in particular is worthy of mention, regardless of whether or not it is the dominant component of the structure. For example: A windmill made entirely of fibreglass with metal strips outlining the blades.*

Metres/Feet: Please identify whether heights provided are in feet or metres. All values will be converted into feet in the Land Use assessment and Notice of Construction as this is the required format for aeronautical publications and database purposes.

All metric/imperial conversions will be calculated as follows:

- Feet to Metres: To obtain metres, multiply the value (in feet) by 0.3048.
- Metres to Feet: To obtain feet, divide the value (in metres) by 0.3048.

NC File Number: If this submission is an amendment or is associated to a previous submission, applicant to indicate NAV CANADA file number assigned to the associated land use submission. For example, Revision to 07-0001 or Reference 07-0001 (building application).

Nearest Town: Closest town to where the development/project will take place.

New Structure: Replacement of a structure is considered a new structure; however, details on the old location and original owner are to be provided in the comments section for NAV CANADA database management. If submitting for an existing structure, NAV CANADA will consider the structure as 'new' if it is not currently recorded in our obstacle database.

OBSTRUCTION TO VISION ON OR ADJACENT TO AN AIRPORT WITH NAV CANADA SERVICES / CONTROL TOWER, FSS CARS: Controller/Specialist visibility requirements are based on dimensions defined in TP 312, Aerodrome Standards & Recommended Practices and TP308, Criteria for the Development of Instrument Procedures. These Transport Canada publications define the airspace around aerodromes that has to be maintained free from obstacles to protect aircraft during either "an entirely visual approach or during the visual segment of an instrument approach". An aircraft on approach should be somewhere within this defined airspace, thus, controllers and specialists require line-of-sight to the areas overlying (above) these obstacle limitation surfaces. It is important to note that structures which meet these obstacle limitation surfaces could still interfere with controller/specialist line-of-sight.

Line of Sight: All aerodrome manoeuvring surfaces, unobstructed line-of-sight from the Tower Cab to the mandatory viewing area shall be provided. Line-of-sight is defined as a straight line from the 'ideal' controller/specialist eye-level position, established at 122 cm (48 in or 4 ft) above the floor and 91 cm (36 in) back from the perpendicular glass line, to any object in the mandatory viewing area. Line-of-sight shall not be obstructed by structures, parked aircraft, large vehicles and surrounding terrain/landscaping. Line-of-sight over buildings or other structures shall have a suitable margin of clearance to allow for snow build-up.

Generation of Smoke/Vapour: Line-of-sight can be impaired by visible contaminants such as steam, or heat distortion patterns. Consideration shall also be given to local weather phenomena that would restrict visibility due to fog or industrial haze from off airport sources.

Reflectivity: Line-of-sight can be impaired by direct or indirect sun glare and external light sources such as apron lights, parking area lights, street lights, or reflective surfaces (water pooling).

Aircraft Parking: Line-of-sight can be obstructed by structures such as parked aircraft, large vehicles and surrounding terrain/landscaping.

Exterior Lighting: Line-of-sight can be impaired by external light sources such as apron lights, parking area lights, street lights.

Other: Any high-powered electronic or telecommunications equipment that does not fall under the preceding categories should be brought to our attention if they can potentially interfere with equipment.

Radar Emission: High powered radio frequencies (in the GHz range) will potentially interfere with NAV CANADA radar performance. Any high-powered frequencies originating from your proposed structure must be brought to the attention of NAV CANADA.

Reference: TP 1247 Land Use in the Vicinity of Airports

Runway Certification Changes: To ensure Instrument Procedures meet design criteria requirements, NAV CANADA must be informed of any changes to runway certification (for example, precision to non-precision, non-precision to non-instrument, etc.). This includes temporary certification changes or changes occurring during a runway closure (the instrument procedure serving a closed runway may still be used for circling or other purposes).

Structure Height: This is the overall height of the structure above ground level.

Buildings: Include roof top structures such as, antennas, advertising boards, architectural features or mechanical rooms above the building height.

Communication Towers: Include the tower structure itself plus all appurtenances such as antennas, lightning rods, equipment, and obstruction lights.

Wind turbines: Overall height of the structure including blade radius (blade in the 12 o'clock position); and to include height at the hub and blade length.

Cranes: Maximum heights to which the crane will be raised when on site include height of mobile crane if used to install a tower crane.

TC Number: Applicant to provide the Transport Canada file number if known.

Temporary Structure: For structures with a planned removal date such as drilling rigs, cranes, meteorological towers, etc., please indicate the estimated removal date.

Total Height: Ground elevation plus the structure height at its highest point.

Type of Structure: The type of structure; for example, Hotel, Drilling Rig, Cranes, Hangar, Development, Wind Turbine, Communication Tower, Meteorological Tower, Flare Stack, Telephone/Transmission line, Cable Crossing, etc. *Note, where the structure is a flag pole, dimensions of maximum flag size is to be stipulated.* Should cranes be required during building construction, please refer to the [Cranes](#) section.

Tower or Support Structures: Applicant to indicate whether they are guyed or self-support structures

Guyed Towers: Applicant may be required to provide drawing with specifications on number of guyed lines, orientation of the structure (with north arrow) in both plan and profile view if available. Drawings may be required if the proposed structure is in close proximity to a NAV CANADA facility.

Self-Support Towers: Applicant to provide a profile view detailing the dimensions of the structure if available. *Note: may be required if the proposed structure is located within 2 km of a NAV CANADA facility.*

Buildings: Require architectural drawings in both plan view (with a north arrow indicator detailing the orientation of the building) and a profile (elevation) view (detailing maximum height of building including rooftop structures such as mechanical room, air conditioners, elevator shaft, etc. with the ground elevation at grade level). The North arrow indicator is particularly important to identify how the structure is oriented for azimuth calculations. *Note: should cranes be required during construction an additional land use submission will be required for assessment.*

VHF Radio: Frequency and Transmitter Power

VHF consists of all frequencies between 30 MHz and 300 MHz. Such frequencies will potentially cause interference with NAV CANADA's communications equipment. Any frequencies originating from the proposed site which fall within this range must be mentioned here to rule out the possibility of interference.

For situations in which VHF radio will exist at a proposed site, NAV CANADA engineers must perform intermodulation studies to ensure that the performance of NAV CANADA communication sites is not compromised. These studies cannot be performed unless the proponent indicates the *specific* VHF frequencies being used onsite. Specify the transmitter power, as this is required to determine whether or not an overlap in coverage will take place.

Wind Farm: For clusters consisting of more than one turbine, the applicant can use one land use proposal submission form with a spreadsheet listing all turbines including turbine number, geographic coordinates (latitude/longitude) in NAD83, ground elevation and structure height. The *Multiple Obstacle Template* spreadsheet sample is provided on the *Proposal Submission Procedures* portion of the web site.