

Project Title GEREUX ISLAND LIGHT STATION L.L 954
GEREAUX ISLAND, ONTARIO

SITE REMEDIATION AND LEAD/PCB BASED PAINT ABATEMENT

Project Number R.064772.001

Project Date 2013-06-21

<u>Section</u>	<u>Title</u>	<u>Pages</u>
<u>Division 00 - Procurement and Contracting Requirements</u>		
00 00 00	SPECIFICATION TITLE SHEET	1
<u>Division 01 - General Requirements</u>		
01 10 00	SUMMARY OF WORK	2
01 11 06	GENERAL INSTRUCTIONS FOR SITE REMEDIATION	9
01 32 16	CONSTRUCTION PROGRESS SCHEDULE - BAR (GANTT) CHART FOR SOIL REMEDIATION	4
01 35 29	HEALTH AND SAFETY REQUIREMENTS FOR SOIL REMEDIATION	6
01 35 43	ENVIRONMENTAL PROCEDURES FOR SOIL REMEDIATION	15
01 42 13	ABBREVIATIONS AND ACRONYMS FOR SOIL REMEDIATION	7
01 56 00	TEMPORARY BARRIERS AND ENCLOSURES FOR SOIL REMEDICATION	5
<u>Division 02 - Existing Conditions</u>		
02 61 00	REMOVAL AND DISPOSAL OF CONTAMINATED SOILS/ BACKFILL AND GRADING	10
02 83 10	LEAD - BASE PAINT ABATEMENT - MINIMUM PRECAUTIONS	14
02 83 11	LEAD - BASE PAINT ABATEMENT - INTERMEDIATE PRECAUTIONS	15
<u>Division 32 - Exterior Improvements</u>		
32 90 00	LANDSCAPING	4
32 92 19	SEEDING AND EROSION BLANKET FOR SOIL REMEDIATION	4

APPENDICES

APPENDIX 1	SITE FIGURES	
APPENDIX 2	ENVIRONMENTAL SITE ASSESSMENT SCREENING REPORT - MITIGATION MEASURES FORM	
APPENDIX 3	SITE PHOTOGRAPHS - EXTERIOR	
APPENDIX 4	SITE PHOTOGRAPHS - INTERIOR	
APPENDIX 5	SITE PHOTOGRAPHS - WATER ACCESS	
APPENDIX 6	LANDFILL CONTENTS	

PART 1 - GENERAL

- 1.1 SECTION INCLUDES .1 Title and description of Work.
- 1.2 PRECEDENCE .1 For Federal Government projects, Division 01 Sections take precedence over technical specification sections in other Divisions of this Project Manual.
- 1.3 WORK COVERED BY CONTRACT DOCUMENTS .1 Work of this Contract comprises of the site preparation, abatement (removal) of lead based paint on three (3) structures, removal of some hazardous and mainly non-hazardous contaminated soil, backfilling and restoration with topsoil and vegetation at the Gereaux Island Light Station, L.L.954 located on Gereaux Island southwest of Britt, Ontario. The three on-site structures, which have no road access, include: a lighthouse, residence building and boathouse. Work on the exterior of the lighthouse includes removal and salvage of metal siding and removal of lead based paint on the structure; repainting and re-installation of new or the salvaged siding. On the interior, remove lead based paint and repaint the abated areas. Work on the residence building includes removal of lead based paint on the interior and repainting the abated areas. Work on the boathouse includes removal of lead based paint on the exterior of the boathouse and repainting the abated areas. Removal and disposal of surficial hazardous and non-hazardous soils contaminated with lead paint and polycyclic aromatic hydrocarbon (PAH) from six (6) areas including any clearing and grubbing. Removal of domestic debris from three (3) dump sites. Supply and place sand backfill and topsoil and restore ground cover with trees, shrubs, seeding and erosion blankets in excavated areas.
- .2 On-site structures include:
.1 Lighthouse.
.2 Light Keepers Residence.
.3 Boathouse.
- .3 Contractor must be licensed and have the appropriate Ontario Ministry of the Environment Certificates of Approval to transport hazardous
-

- 1.3 WORK COVERED BY CONTRACT DOCUMENTS (Cont'd) .3 (Cont'd)
lead and PCB contaminated soil over water.
- CONTRACT DOCUMENTS (Cont'd) .4 This contract also includes:
- .1 Obtaining any required permits.
 - .2 Locating and clearly marking underground and overhead utilities.
 - .3 Protection of buildings and footings.
 - .4 Preparation of the site including the construction of access roads where required and the removal of debris from three (3) dump sites.
 - .5 Clearing and grubbing work area prior to excavation. The tree stumps and roots are to be disposed of off site.
 - .6 Installation of new or salvaged metal siding and painting of trim to match original colour schemes.
 - .7 Removal and off site disposal of the top approximately 0.20 m surficial layer of hazardous and non-hazardous PAH and/or metal contaminated soil at the direction of the Departmental Representative.
 - .8 Supply and placement of approved clean sand fill and topsoil materials and compaction and final contour grading of excavated area.
 - .9 Restoration of ground cover, including:
 - .1 Replanting of shrubs or trees.
 - .2 Fertilizing, seeding, and application of erosion control blankets.
- 1.4 CONTRACT FORM .1 "Bid and Acceptance Form - Combined Price" and the Unit Price Table.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not used.
-

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

1.1 MINIMUM
STANDARDS

- .1 Execute work to meet or exceed:
- .1 Rules and regulations of authorities having jurisdiction.
 - .2 Observe and enforce construction safety measures required by National Building Code 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
 - .3 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter 0.1 as amended, O.Reg. 490/09 Designated Substances, O.Reg. 833/90 Control of Exposure to Biological or Chemical Agents, Workplace Safety and Insurance Act and municipal statutes and authorities.
 - .4 Environmental Protection Act, Revised Statutes of Ontario 1990, Chapter E19 as amended, O. Reg. 102/94, Waste Audits and Waste Reduction Work Plans, O. Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs, O. Reg. 153/04 Record of Site Programs, O. Reg. 153/04 Record of Site Condition, and O.Reg 347/90 General Waste Management.
 - .5 Canadian Environmental Assessment Act.
 - .6 Canadian Environmental Protection Act (New Substance Notification Regulations).
 - .7 Transportation of Dangerous Goods Act.
 - .8 Fisheries Act.
 - .9 Migratory Birds Convention Act.
 - .10 Migratory Birds Regulations.

1.2 AUTHORITIES
HAVING JURISDICTION

- .1 The Federal Fire Commissioner is the sole authority having jurisdiction over this project with regards fire standards.

1.3 LOAD
RESTRICTIONS

- .1 Within the Town of Britt the year round maximum load restrictions are posted.
- .2 Comply with posted restrictions. Acquire and submit to Departmental Representative copies of all necessary permits.
- .3 Small floating wooden dock on-site maybe operational for small sized vessels.
- .1 Dock is not capable of supporting any heavy machinery.

-
- 1.3 LOAD RESTRICTIONS (Cont'd) .3 (Cont'd)
.2 Dock may be used for passenger and lightweight supply transfers.
- 1.4 TAXES .1 Pay applicable Federal, Provincial and Municipal taxes.
- 1.5 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.
- 1.6 EXAMINATION .1 Examine existing conditions and determine conditions affecting work.
.2 Notify Departmental Representative in writing of any discrepancies between contract documents and site conditions.
- 1.7 DOCUMENTS .1 Keep one (1) copy of contract documents at the site.
- 1.8 ELECTRONIC SUBMITTALS .1 Submit number of hard copies specified for each type and format of submittal and in also submit in electronic format as .pdf files. Forward pdf files on CD, USB, through email or ftp site.
- 1.9 PRODUCT DATA SHEETS .1 Submit product data sheets to Departmental Representative for review at least five (5) days before the start of field activities.
.2 Submit laboratory analytical results for sand backfill material prior to delivery to the site.
-

- 1.10 ADDITIONAL PHOTOGRAPHS
- .1 Submit electronic copies of colour digital photography in jpeg format, standard resolution.
 - .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: at the completion of: site preparation, debris removal, paint abatement, paint encapsulation, excavation of contaminated soils, fill/grading, completion of restoration and as directed by Departmental Representative.
- 1.11 SAMPLES
- .1 Submit duplicate samples of new materials being installed under this contract.
 - .2 Identify manufacturer's name and product.
 - .3 Installed work shall match reviewed sample.
- 1.12 ADDITIONAL DRAWING/PHOTOGRAPHS
- .1 Departmental Representative may furnish additional drawings/aerial photographs to clarify work.
 - .2 Such drawings/aerial photographs become part of Contract Documents.
- 1.13 PROTECTION
- .1 Protect existing work and on-site structures from damage.
 - .2 Replace and repair damaged existing work and on-site structures with material and finish to match original.
 - .3 Protect existing trees and plants on site and adjacent properties.
- 1.14 EXISTING SERVICES
- .1 Establish location, protect and maintain existing utility lines.
 - .2 Maintain existing services in occupied areas.
 - .3 Provide sanitary facilities.
-

-
- 1.14 EXISTING SERVICES
(Cont'd)
- .4 Provide water and electrical services.
- 1.15 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.
- 1.16 METRIC SIZED MATERIALS
- .1 SI metric units of measurement are used exclusively on the drawings and in the specifications for this project.
- 1.17 MATERIAL AND EQUIPMENT
- .1 Use new products unless otherwise specified.
- .2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.
- .3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.
- 1.18 CO-ORDINATION AND CO-OPERATION
- .1 Site may be occupied during execution of work.
- .2 Light Keeper's Residence (R.B.) may be occupied during execution of work. Lighthouse (L.H.) will not be occupied during execution of work.
- .3 Work areas will not be occupied during execution of work.
- .4 Execute work with minimum disturbance to public and on-site buildings.
- .5 Where security has been reduced by work of contract, provide temporary means to maintain security.
- .6 Maintain access and exits.
-

- 1.19 ALTERATIONS TO EXISTING SITE .1 Remove and recycle, compost, anaerobic digest or dispose of:
.1 Trees, shrubs and other plant material as indicated, and as directed by the Departmental Representative. Refer to section 02 61 00.
.2 Paint chips, paint chip collection tarps and related paint abatement materials and as directed by the Departmental Representative.
- 1.20 INSPECTION AND TESTING .1 When initial tests and inspections reveal work not to contract requirements, pay for tests and inspections required by Departmental Representative on corrected work.
- 1.21 COST BREAKDOWN .1 Within 48 hours of notification of acceptance of bid furnish a cost breakdown by Section aggregating Contract Amount.
.2 Within 48 hours of acceptance of bid submit a list of subcontractors.
- 1.22 SCHEDULING .1 On Award of Contract submit bar chart construction scheduled for work in accordance with Section 01 32 16.
.2 Carry out work during normal working hours.
- 1.23 CLEANING .1 Maintain project free of accumulated waste and rubbish.
.2 Final cleaning:
.1 Remove temporary protection.
.2 Remove dust, dirt and foreign matter from surfaces.
.3 Broom clean paved exterior surfaces, rake clean other exterior surfaces.
- 1.24 ASBESTOS DISCOVERY .1 If during alteration work existing asbestos material is discovered, stop work and immediately notify Departmental Representative. Do not remove any existing material containing asbestos fibres.
-

1.25 DESIGNATED
SUBSTANCES

- .1 The project site has been surveyed for the presence of designated substances referred to in Regulations for Construction Projects, O.Reg. 213/91 as amended.
- .2 Designated substances present on site are included in previous environmental reports available for review at PWGSC Office, 11th floor 4900 Yonge Street, Toronto, ON and include:
 - .1 Lead in paint and solder of copper pipes.
 - .2 PCBs in interior paints.
 - .3 Mercury in flourescent light bulbs.
 - .4 Benzene in gasoline stored on site.
 - .5 Silica within concrete foundations on site.
- .3 Provide copies of this report to each prospective subcontractor prior to entering into a contract with them.
- .4 Post prominent notices identifying and warning of the hazardous agent in the part of the workplace in which the agent is found or used. Notices shall be in English and other languages prescribed under the Occupational Health and Safety Act.

1.26 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 material safety data sheets acceptable to HRSDC - Labour Program.

1.27 POLLUTION
CONTROL

- .1 Spills of deleterious substances:
 - .1 Immediately contain, limit spread and clean up in accordance with provincial regulatory requirements.
 - .2 Report immediately to Ontario Spills Action Centre: 1-800-268-6060.
 - .3 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.
-

- 1.28 OPSS AND OPSD .1 OPSS Ontario Provincial Standard Specifications and OPSD Ontario Provincial Standard Drawings quoted in these specifications are available online at <http://www.raqsa.mto.gov.on.ca/techpubs/ops.nsf/OPSHomepage>.
- 1.29 PROJECT MEETINGS .1 Administrative:
- .1 Schedule and administer project meetings throughout the progress of the work as directed by the Departmental Representative.
 - .2 Prepare agenda for meetings.
 - .3 Distribute written notice of each meeting four (4) 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 three 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.
- .2 Preconstruction meeting:
- .1 Within five (5) days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.
 - .2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.
 - .3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.
 - .4 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.
 - .3 Schedule of submission of Health and Safety and Environmental Protection Plans.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities and fences.
 - .5 Site security.
 - .6 Proposed changes, change orders, procedures, approvals required, mark-up
-

1.29 PROJECT
MEETINGS
(Cont'd)

- .2 Preconstruction meeting:(Cont'd)
 - .4 Agenda to include:(Cont'd)
 - .6 (Cont'd)
percentages permitted, time extensions,
overtime, administrative requirements.
 - .7 Owner provided products.
 - .8 Maintenance manuals.
 - .9 Take-over procedures, acceptance,
warranties.
 - .10 Progress claims, administrative
procedures, photographs, hold backs.
 - .11 Appointment of inspection and testing
agencies or firms.
 - .12 Insurances and transcript of
policies.
- .3 Progress meetings:
 - .1 Project meetings will be requested as
required by the Departmental Representative
 - .2 Contractor, major Subcontractors involved
in Work and Departmental Representative are to
be in attendance.
 - .3 Notify parties minimum 3 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, approval of minutes of
previous meeting.
 - .2 Review of Work progress since
previous meeting.
 - .3 Field observations, problems,
conflicts.
 - .4 Problems which impede construction
schedule.
 - .5 Corrective measures and procedures to
regain projected schedule.
 - .6 Revision to construction schedule.
 - .7 Progress schedule, during succeeding
work period.
 - .8 Review submittal schedules: expedite
as required.
 - .9 Maintenance of quality standards.
 - .10 Review proposed changes for affect on
construction schedule and on completion
date.
 - .11 Other business.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

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: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
 - .5 Duration: number of work periods (not including holidays or other non-working periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
 - .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
 - .7 Milestone: significant event in project, usually completion of major deliverable.
 - .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
 - .9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.
-

- 1.2 REQUIREMENTS
- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
 - .2 Plan to complete Work in accordance with prescribed milestones and time frame.
 - .3 Limit activity durations to maximum of approximately 10 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 11 06.
 - .2 Submit to Departmental Representative within 5 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 three (3) working days of receipt of acceptance of Master Plan.
- 1.4 PROJECT MILESTONES
- .1 Project milestones form interim targets for Project Schedule.
 - .1 Site preparation including access road construction and site clearing and grubbing within fifteen (15) working days of Award of Contract date.
 - .2 Exterior abatement of the structures on site within twenty-five (25) working days of award of Contract.
 - .3 Interior abatement of one structure within fifteen (15) working days of award of contract.
 - .4 Interior abatement of remaining structure within twenty (20) working days of award of contract.
 - .5 Excavation completed within thirty (30) working days of Award of Contract date.
 - .6 Fill, grading, landscaping, seeding and erosion blanket completed within thirty-five (35) working days of Award of Contract date.
 - .7 Certificate of Completion within forty (40) working days of Award of Contract date.
-

- 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 five (5) working days.
 - .3 Revise impractical schedule and resubmit within five (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 minimum milestone and activity types as follows:
 - .3 Award.
 - .1 Permits.
 - .2 Mobilization.
 - .3 Site Preparation.
 - .4 Paint Abatement.
 - .5 Excavation.
 - .6 Backfill and Grading.
 - .7 Landscaping.
 - .8 Seeding and Erosion Control Blanket.
 - .9 Demobilization
 - .4 Contractor to allow four (4) days for receipt of analytical results.
 - .5 Access to the site by water may be restricted at times due to weather and water conditions common to Georgian Bay.
- 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 Weather related delays will be discussed and negotiated.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 REFERENCES
- .1 Province of Ontario:
 - .1 Occupational Health and Safety Act Revised Statutes of Ontario 1990, Chapter O.1 as amended, and Regulations for Construction Projects, O. Reg. 213/91 as amended.
 - .2 Workplace Safety and Insurance Act, 1997.
 - .3 Municipal statutes and authorities.
 - .2 Canadian Standards Association (CSA): Canada
 - .1 CSA-S350-M1980(R2003), Code of Practice for Safety in Demolition of Structures.
 - .3 National Building Code 2010 (NBC):
 - .1 NBC 2010, Division B, Part 8 Safety Measures at Construction and Demolition Sites.
 - .4 National Fire Code 2010 (NFC):
 - .1 NFC 2010, Division B, Part 2 Emergency Planning, subsection 2.8.2 Fire Safety Plan.
 - .5 Federal Fire Commissioner (FFC):
 - .1 FC-301 Standard for Construction Operations, June 1982.
 - .2 FC-302 Standard for Welding and Cutting, June 1982.

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
4900 Yonge Street 8th Floor
Willowdale, Ontario M2N 6A8

and copies may be obtained from:

Human Resources and Social Development Canada
Labour Program
Fire Protection Engineering Services
Ottawa, Ontario K1A 0J2

- 1.2 SUBMITTALS
- .1 Make submittals in accordance with Section 01 11 06.
 - .2 Submit site-specific Health and Safety Plan:
Within five (5) days after date of Notice to Proceed and prior to commencement of Work.
Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
-

- 1.2 SUBMITTALS .2 (Cont'd)
- (Cont'd)
-
- .2 Results of safety and health risk or hazard analysis for site tasks and operations found in work plan.
- .3 Measures and Controls to be implemented to address identifying safety hazards and risks.
- .4 Provide a fire safety plan specific to work location.
- .5 Contractor's and subcontractors safety communication plan.
- .6 Contingency and Emergency Response Plan addressing standard operating procedures specific to the project site to be implemented during emergency situations.
- .3 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within three(3) days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within two (2) days after receipt of comments from Departmental Representative.
- .4 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.
- .5 Submit names of personnel and alternates responsible for site safety and health.
- .6 Submit records of Contractor's Health and Safety meetings when requested.
- .7 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative, weekly.
- .8 Submit copies of orders, directions or reports issued by health and safety inspectors of the authorities having jurisdiction.
- .9 Submit copies of incident and accident reports.
- .10 Submit Material Safety Data Sheets (MSDS).
- .11 Submit Workplace Safety and Insurance Board (WSIB)- Experience Rating Report.
-

- 1.3 FILING OF NOTICE .1 File Notice of Project with Provincial authorities prior to commencement of Work.
- 1.4 WORK PERMIT .1 Obtain permits related to project prior to commencement of Work.
- 1.5 SAFETY ASSESSMENT .1 Perform site specific safety hazard assessment related to project.
- 1.6 MEETINGS .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- 1.7 REGULATORY REQUIREMENTS .1 Comply with the Acts and regulations of the Province of Ontario.
.2 Comply with specified standards and regulations to ensure safe operations at site.
- 1.8 PROJECT/SITE CONDITIONS .1 Work at the site will involve contact with:
.1 Lead and PCB's in paints and metals and PAHs in soils.
.2 Asbestos containing floor tiles.
.2 Site has no road access from mainland.
.2 Access to the site is by water or helicopter only.
.3 Uneven rocky terrain with no established roads.
- 1.9 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 requesting improvements.
-

- 1.9 GENERAL REQUIREMENTS (Cont'd) .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.
- 1.10 COMPLIANCE REQUIREMENTS .1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter 0.1, as amended.
- 1.11 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 for the Province of Ontario.
- 1.12 UNFORESEEN HAZARDS .1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, immediately stop work and advise Departmental Representative verbally and in writing.
- .2 Follow procedures in place for Employees Right to Refuse Work as specified in the Occupational Health and Safety Act for the Province of Ontario.
- 1.13 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 working knowledge of occupational safety and health regulations.
- .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing
-

- 1.13 HEALTH AND SAFETY CO-ORDINATOR (Cont'd)
- .1 (Cont'd)
- .2 (Cont'd)
- required training are not permitted to enter site to perform Work.
- .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .4 Be on site during execution of Work and report directly to and be under direction of site supervisor.
- 1.14 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 of Ontario, 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 or Joint Health and Safety Committee members (if applicable).
- .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 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.
- 1.15 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.
-

1.16 BLASTING .1 Blasting or other use of explosives is not permitted at the site.

1.17 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 a Competent Supervisor to stop or start Work at the Competent Supervisor's discretion when it is necessary or advisable for reasons of health or safety. Departmental Representative may also stop Work for health and safety considerations.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 DEFINITIONS
- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; 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.
 - .3 Green Remediation: the application of technologies and approaches that enhance a cleanup project's environmental, social, and economic footprints, as defined by the California Department of Toxic Substances Control.
- 1.2 REFERENCES
- .1 O.Reg 347/90 Ministry of Environment Fact Sheet.
 - .2 Land Disposal Restrictions in O.Reg. 347 - General Waste Disposal under Ontario EPA and MOE Fact Sheet "Summary of Land Disposal Restrictions, Treatment and Notification Requirements for Waste Generators".
- 1.3 SUBMITTALS
- .1 Submittals: in accordance with Section 01 11 06.
 - .2 Prior to commencing construction activities or delivery of materials to site, submit an Environmental Protection Plan for review and approval by Departmental Representative. The Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction. The Environmental Protection Plan shall take into account the
-

-
- 1.3 SUBMITTALS .2 (Cont'd)
(Cont'd)
- .3 recommendations of the Environmental Assessment. Refer to Appendix 2 Environmental Assessment Screening Report.
- .3 Address topics at level of detail commensurate with environmental issue and required remedial tasks.
- .4 Environmental protection plan is to include:
- .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for training site personnel.
 - .3 Descriptions of environmental protection personnel training program.
 - .4 Erosion and sediment control plan which identifies 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.
 - .5 Drawings showing locations of proposed temporary excavations or embankments, haul and access roads, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.
 - .6 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.
 - .7 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .8 Hazardous and Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .9 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
 - .10 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
-

-
- 1.3 SUBMITTALS .4 (Cont'd)
- (Cont'd)
- .11 Waste water management plan that identifies methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as clean-up water, disinfection water.
- .12 Historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .5 Complete the Environmental Assessment Mitigation Report Form (Appendix 2) during work program and submit to Departmental Representative with closing documents upon completion of the project.
- 1.4 FIRES .1 Fires and burning of rubbish on site not permitted.
- 1.5 DISPOSAL OF WASTES .1 Do not bury rubbish and waste materials on site.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.
- .3 Dispose of wastewater generated by excavation activities at a licensed disposal facility in accordance with local and/or provincial authorities.
- .4 Do not discharge wastes into streams or waterways.
- .5 Within the radius of hazardous soil, the tree roots and stumps will be removed off-site with the excavated impacted soil. The classification of tree material will be determined by the Departmental Representative based on site conditions. The remaining tree materials and stumps from the non-hazardous area will be stockpiled on-site in an area designated by the Departmental Representative.
- .6 Appropriate procedures shall be implemented for handling, temporary storage, transport and disposal of impacted soils during all phases of the project. Refer to Land Disposal Restrictions in O.Reg. 347 - General Waste Disposal under
-

1.5 DISPOSAL OF
WASTES
(Cont'd)

- .6 (Cont'd)
Ontario EPA and MOE Fact Sheet "Summary of Land Disposal Restrictions, Treatment and Notification Requirements for Waste Generators". Off-site disposal will be by licensed haulers to a MOE-approved disposal facility.
- .7 Submit proof of licensed waste hauler along with proof of a licensed waste disposal site.
- .8 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.

1.6 VEHICULAR
ACCESS AND PARKING

- .1 Maintenance and Use:
Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by Departmental Representative; transport and place into designated area approved by Departmental Representative. Clean access at a frequency designated by the Departmental Representative.
- .2 Departmental Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to Departmental Representative.
- .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 During remedial activities designated fuelling area(s) will be established.
- .5 Refuelling of vehicles and equipment shall not be conducted near watercourses.

1.7 EQUIPMENT
DECONTAMINATION

- .1 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.
- .2 Perform equipment decontamination in a manner to prevent cross contaminating un-impacted areas.
- .3 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. Contractor to pay particular attention to tire treads, equipment tracks, springs, joints, and sprockets.
- .4 Use of high-pressure low volume, hot water or steam supplemented by detergents or solvents only as approved by Departmental Representative.
- .5 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.
- .6 Transfer sediments to a designated area approved by the Departmental Representative.
- .7 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

1.8 DRAINAGE

- .1 Provide erosion and sediment control plan.
 - .1 Plan to include the type and location of erosion and sediment controls to be provided. Include monitoring and reporting requirements to assure that control measures are in compliance with mitigation measures in the Environmental Assessment Screening Report, Federal, Provincial and Municipal laws and regulations.
 - .2 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
-

-
- 1.8 DRAINAGE (Cont'd)
- .3 Do not allow water containing suspended materials to enter into waterways, sewer or drainage systems.
 - .4 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.
 - .5 Do not direct water flow in a manner which would cause erosion to existing areas
- 1.9 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 Groundwater or surface water entering excavations shall be collected and disposed of at an MOE-approved facility.
- 1.10 SITE CLEARING AND PLANT PROTECTION
- .1 Protect trees and plants on site and adjacent properties where indicated or as directed by the Departmental Representative.
 - .2 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
 - .3 Restrict tree removal to areas indicated or designated by Departmental Representative.
 - .4 Trees removed that are greater than 5 centimetres in diameter at a height of 1.2 m above ground will be replaced following a policy of 'for every tree removed two are planted.' Replanting will occur on relatively flat areas only as close to the original site as possible.
 - .5 Planted tree species will include:
 - .1 Staghorn Sumac (*Rhus typhina*)
 - .2 Red Alder (*Alnus rubra*)
- 1.11 VEGETATION
- .1 Protect vegetation that does not have to be removed.
-

-
- 1.11 VEGETATION
(Cont'd)
- .2 Operated construction machinery in a manner that minimizes damage to adjacent vegetation.
- 1.12 WORK ADJACENT TO WATERWAYS
- .1 Do not operate construction equipment in waterways.
- .2 Do not use waterway beds for borrow material without Departmental Representative's approval.
- .3 Do not dump excavated fill, waste material or debris in waterways.
- .4 Design and construct temporary crossings to minimize erosion to waterways.
- .5 Do not skid logs or construction materials across waterways.
- .6 Avoid indicated spawning beds when constructing temporary crossings of waterways.
- .7 Do not use water from waterways.
- .8 Special care shall be exercised while working near water's edge including site-specific erosion and sediment control measures. Silt fences shall be used to minimize sediment transport as well as limit access to watercourses by site personnel.
- 1.13 POLLUTION CONTROL
- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Vehicles and equipment must be maintained in good working condition, equipped with emission controls as applicable to local authorities emission requirements.
- .3 Implement dust abatement measures, as required to control dust.
- .4 Control emissions from equipment to local authorities emission requirements.
- .5 Prevent lead based paints from contaminating air and waterways beyond the removal area. Lay an impervious polyethylene 6 mm thick tarp around the base of the structures to collect any paint chips and debris during exterior paint abatement. Carefully wrap up tarp to contain
-

1.14 SPILLS OR
RELEASE OF
DELETERIOUS
SUBSTANCES
(Cont'd)

- .7 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.
- .8 Equipment fuelling or lubricating shall occur in a designated area with proper controls to prevent the release of deleterious substances, and shall be conducted away from any surface water drains or collection points.
- .9 Any equipment remaining on site overnight shall have appropriately placed drip pans.
- .10 The rinse, cleaning water or solvents for glues, wood preservatives and other potentially harmful or toxic substances should be controlled so as to prevent leakage, loss or discharge into the storm drain system or into the marine environment.
- .11 Protect the roadways from tracking of mud, soil, and debris throughout the work.
- .12 Prevent discharges containing asphalt, grout, concrete or other waste materials from reaching storm drains or the marine environment. This includes, but is not limited to:

1.15 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 Ensure that noise control devices (i.e. mufflers, silencers) on construction equipment are properly maintained.

1.16 HISTORICAL/
ARCHAEOLOGICAL
CONTROL

- .1 Provide historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to

1.16 HISTORICAL/
ARCHAEOLOGICAL
CONTROL
(Cont'd)

- .1 (Cont'd)
be onsite or in area are discovered during construction.
- .2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.
- .3 If archaeological deposits are discovered during the project work shall stop immediately and the Departmental Representative shall immediately be notified.
- .4 Archaeologically significant material, if found on the property, remains the property of the Crown and shall not be removed from the site.
- .5 Management of the archaeological materials will be coordinated through Departmental Representative.

1.17 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, 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.
- .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.

1.18 SPECIES AT
RISK

- .1 Should a species at risk or its critical habitat be encountered, measures are to be implemented to avoid destruction, injury or interference with the species, its residence and/or its habitat (e.g. through siting, timing or design changes). If the foregoing cannot be avoided Contractor should cease work and contact
-

- 1.18 SPECIES AT RISK
(Cont'd)
- .1 (Cont'd)
Departmental Representative for advice regarding mitigation measures.
 - .2 In the event that it is determined that the project likely may have unexpected adverse effects on species at risk (SAR), the Contractor shall notify the Department Representative immediately.
 - .3 Refer to the Environmental Assessment Screening Report (Appendix 2) for species at risk and related mitigation issues.
- 1.19 MIGRATORY BIRDS/WILDLIFE HABITAT
HABITAT
- .1 Disturbance and destruction of habitat should be timed outside of breeding season of mid-April to end of July.
 - .2 Ensure all works are in compliance with the Migratory Birds Convention Act.
 - .3 Restrict vehicle movements to construction areas and access roads and avoid harassment of animals.
- 1.20 FISH/ FISH HABITAT
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.
- 1.21 GREEN REMEDIATION
REMEDICATION
- .1 The following section provides Green Remediation techniques that are to be used where practical during remedial activities.
 - .2 Energy
 - .1 Select suitably sized power machinery and equipment that operate using clean alternative fuels, are energy efficient or hybrid, and maintain equipment at peak performance to maximize efficiency.
 - .2 Substitute a fuel-based energy source with one that uses on-site renewable energy systems, wind, solar, biomass, biofuels, methane gas, or hydrogen fuel cells to replace or offset energy requirements.
 - .3 Purchase green power through local utility programs and Renewable Energy Credits and Certificates.
-

1.21 GREEN
REMEDICATION
(Cont'd)

- .2 (Cont'd)
 - .4 Use optimized passive-energy technologies (with little or no demand for external utility power).
 - .5 Purchase materials from one (1) supplier of locally produced products and select local providers for field operations.
 - .6 Coordinate outside services and service providers to minimize transport of equipment.
 - .7 Employ auxiliary power units to power cab heating and air conditioning when a machine is unengaged.
 - .8 Use treatment systems with optimum efficiency.
 - .9 Evaluate and optimize energy efficiency of equipment with high energy demands periodically and adjust operations accordingly.
 - .10 Offset carbon emissions through renewable energy credits, green pricing programs, and power purchase agreements.
 - .11 Replace, repower, or retrofit older engines with advanced emission control devices to reduce harmful pollutants.
 - .12 Control nuisance odours associated with diesel emissions from construction equipment.
 - .13 Maintain engines to meet original standards and train operators to run equipment efficiently.
 - .3 Water
 - .1 Minimize fresh water and potable water consumption and maximize use of non-potable water and water reuse during daily operations and treatment processes.
 - .2 Use native vegetation requiring little or no irrigation.
 - .3 Reclaim treated water for beneficial use such as irrigation.
 - .4 Prevent nutrient loading in nearby water bodies.
 - .5 Return treated groundwater to its original aquifer to maintain the original groundwater resource, and return unused water to surface water bodies.
 - .6 Minimize runoff using open-space preservation methods such as duster development, reduced pavement widths, and shared transportation access.
 - .7 Utilize engineered structures or landscape features such as basins, trenches, porous pavement, disconnected downspouts, and rain gardens to capture and infiltrate runoff.
 - .8 Store captured runoff in rain barrels, cisterns, green roofs, and natural depressions and reuse operational greywater.
-

1.21 GREEN
REMEDICATION
(Cont'd)

- .3 (Cont'd)
 - .9 Utilize biodegradable tarps and mats to contain dust rather than spraying with water.

 - .4 Air Emissions
 - .1 Reduce atmospheric release of toxic or priority pollutants and minimize dust export of contaminants.
 - .2 Consolidate onsite and offsite vehicular trips to reduce fuel consumption.
 - .3 Secure and cover loose, excavated material in open trucks, and reuse the with reuseable covers.
 - .4 Re-vegetate excavated areas as quickly as possible.
 - .5 Retrofit machinery and heavy equipment for diesel-engine emission control and exhaust treatment technologies such as particulate filters and oxidation catalyts.
 - .6 Maintain engines of vehicles and machinery in accordance with manufacturer recommendations.
 - .7 Modify field operations through combined activity schedules, an idle reduction plan, and using machinery with automatic idle-shutdown devices.
 - .8 Replace conventional engines of existing vehicles and purchase new vehicles equipped for hybrid systems or alternative fuel.
 - .9 Use rail for the transportation of materials to minimize greenhouse gas emissions.
 - .10 Minimize the use of heavy equipment that consumes high volumes of fuel and use cleaner fuels such as ultra-low sulphur diesel.

 - .5 Waste
 - .1 Minimize waste generation and re-use materials whenever possible.
 - .2 Segregate materials such as metals, concrete, and lumber for reuse or recycling.
 - .3 Select the closest waste receiver.
 - .4 Use products with recycled and bio-based content and recycling potential.
 - .5 Salvage uncontaminated and pest- or disease-free organic debris for use as on-site or off-site infill, mulch, or compost.
 - .6 Salvage uncontaminated objects with potential recycle, resale, donation, or onsite infrastructure value such as steel, concrete, granite, and storage containers.
 - .7 Reuse or recycle recovered product from remedial activities.
 - .8 Salvage wood scraps for onsite landscaping use, mulch, and erosion control.
-

1.21 GREEN
REMEDICATION
(Cont'd)

- .6 Land and Ecosystems
- .1 Establish efficient traffic patterns to minimize soil compaction in work areas.
 - .2 Install silt basins to capture sediment runoff along slopes.
 - .3 Ensure all equipment is clean prior to arrival on site to minimize potential of transporting invasive species.
 - .4 Minimize soil and habitat disturbance and reduce noise and lighting disturbance.
 - .5 Increase wildlife habitat.
 - .6 Create new greenspaces or corridors.
 - .7 Prevent topsoil compaction and increase subsurface water infiltration.
 - .8 Plant native vegetation.
 - .9 Provide uncompacted soil that is conducive to plant growth.
 - .10 Utilize environmentally friendly landscaping solutions to minimize environmental impacts at the site.
 - .11 Use environmentally friendly lubricants for engine maintenance.
 - .12 Decontaminate equipment away from environmentally sensitive areas.
 - .13 Use secondary containment to avoid cross-contamination.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 ABBREVIATIONS AND ACRONYMS .1 The abbreviations and acronyms are commonly found in the Project Manual and represent the associated organizations or terms.
- 1.2 MATERIALS, EQUIPMENT AND METHODS .1 A:
.1 AL: aluminum.
.2 AB: anchor bolt.
- .2 B:
.1 B: base.
.2 BEAST: benthic assessment of sediment.
.3 BH: bore hole.
.4 BL: bottom layer.
.5 BLK: block.
.6 BOT: bottom.
.7 BMP: best management practice.
.8 B PL: base plate.
.9 BRG: bearing.
.10 BSMT: basement.
.11 BTEX: benzene, toluene, ethylbenzene, and xylenes.
- .3 C:
.1 CB: catch basin.
.2 CC: centre to centre.
.3 CCN: contemplated change notice.
.4 CDF: controlled density fill.
.5 CEC: Canadian electrical code.
.6 CHS: Canadian hydrographic service.
.7 CL: centreline.
.8 CLR: clear.
.9 COL: column.
.10 CONC: concrete.
.11 CONC BLK: concrete block.
.12 CONT: continuous.
.13 COMPL: complete.
.14 CPM: critical path method.
.15 C/W: complete with.
- .4 D:
.1 D: deep.
.2 DEG: degree.
.3 DIA: diameter.
.4 DIM: dimension.
.5 DL: dead load.
.6 DSS: designated substance survey
-

1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)

- .5 E:
.1 EA: each.
.2 ECF: engineered containment facility.
.3 EE: each end.
.4 EF: each face.
.5 EL: elevation.
.6 ELEC: electric.
.7 ENCL: enclosure.
.8 EQ: equal.
.9 EXIST: existing.
.10 EW: each way.
- .6 F:
.1 FC: fuel contributed.
.2 FDN: foundation.
.3 FEXT: fire extinguisher.
.4 FIN: finish.
.5 FIP: federal identity program.
.6 FLD: field.
.7 FRR: fire resistance rating.
.8 FTG: footing.
- .7 G:
.1 GALV: galvanized steel.
.2 GC: General Conditions.
.3 GCL: geosynthetic clay liner.
- .8 H:
.1 HOR: horizontal.
.2 HOR EF: horizontal each face.
.3 HP: hydro pole.
.4 HPA: Hamilton Port Authority.
.5 HT: height.
.6 HYD: hydrant.
- .9 I:
.1 ID: inside diameter.
- .10 J:
.1 JT: joint.
- .11 L:
.1 LG: long.
.2 LL: live load.
- .12 M:
.1 MAS: masonry.
.2 MAX: maximum.
.3 MET: metal.
.4 MH: maintenance hole.
.5 MIN: minimum.
- .13 N:
.1 NBC: national building code.
.2 NF: near face.
-

-
- 1.2 MATERIALS,
EQUIPMENT AND
METHODS
(Cont'd)
- .13 N:(Cont'd)
.3 NFC: national fire code.
.4 NIC: not in contract.
.5 NTS: not to scale.
- .14 O:
.1 OBC: Ontario building code.
.2 OC: on centre.
.3 OD: outside diameter.
.4 OPNG: opening.
- .15 P:
.1 PAH: polynuclear aromatic hydrocarbons.
.2 PCB: polychlorinated biphenyl.
.3 PCC: precast concrete.
.4 PL: plate.
.5 PLYWD: plywood.
.6 PR: pair.
.7 PREFAB: prefabricated.
.8 PRFL: profile.
.9 PT: paint.
.10 PVC: polyvinyl cholide.
- .16 R:
.1 R: radius.
.2 RC: reinforced concrete.
.3 REINF: reinforced/reinforcing.
.4 REQD: required.
.5 REQT: requirement.
.6 RO: rough opening.
.7 RWL: rain water leader.
- .17 S:
.1 SAN SEW: sanitary sewer.
.2 SCHED: schedule.
.3 SD: smoke developed.
.4 SECT: section.
.5 SPEC: specification.
.6 SS: stainless steel.
.7 STD: standard.
.8 STL: steel.
.9 STC: sound tranmission class.
.10 STL PL: steel plate.
.11 STN: stone.
.12 STR: structure or structural.
.13 ST SEW: storm sewer.
- .18 T:
.1 T: top.
.2 T&B: top and bottom.
.3 TCB: turbidity control plan.
.4 TCLP:Toxicity characteristic leaching
procedure
.5 TEL: telephone.
.6 THKNS: thickness.
-

- 1.3 STANDARDS ORGANIZATIONS
(Cont'd)
- .1 (Cont'd)
- .20 FSC - Forest Stewardship Council.
 - .21 IEEE - Institute of Electrical and Electronics Engineers Inc.
 - .22 ISO - International Organization for Standardization.
 - .23 LEED - LEED Canada, Leadership in Energy and Environmental Design.
 - .24 MPI - Master Painters Insitute.
 - .25 NAAMM - National Association of Architectural Metal Manufacturers.
 - .26 NCPI - National Clay Pipe Institute.
 - .27 NEMA - National Electrical Manufacturers Association.
 - .28 NFPA - National Fire Protection Association.
 - .29 OPSD - Ontario Provincial Standard Drawings.
 - .30 OPSS - Ontario Provincial Standard Specifications.
 - .31 PPI - Plasctics Pipe Institute.
 - .32 SCAQMD - South Coast Air Quality Management District.
 - .33 TIA - Telecommunications Industry Association.
 - .34 UL - Underwriters Laboratories.
 - .35 ULC - Underwriters Laboratories of Canada.
 - .36 US EPA - United States Environmental Protection Agency.
 - .37 WH - Warnock Hersey.
- 1.4 FEDERAL GOVERNMENT DEPARTMENTS AND AGENGIES
- .1 Departments, agencies and crown corporations.
- .1 CEAA - Canadian Environmental Assessment Agency.
 - .2 CSC - Correctional Service Canada.
 - .3 CRA - Canada Revenue Agency.
 - .4 DFO - Fisheries and Oceans Canada.
 - .5 DND - Department of National Defence.
 - .6 EC - Environment Canada.
 - .7 FHBRO - Federal Heritage Buildings Review Office.
 - .8 HCD - Heritage Conservation Directorate.
 - .9 LC - Labour Canada.
 - .10 PC - Parks Canada.
 - .11 PWGSC - Public Works and Government Services Canada.
 - .12 RCMP - Royal Canadian Mounted Police.
 - .13 TBS - Treasury Board Secretariat.
 - .14 TC - Transport Canada.
-

- 1.5 PROVINCIAL GOVERNMENT DEPARTMENTS AND AGENCIES .1 MOE - Ontario Ministry of Environment.
.2 MOL - Ontario Ministry of Labour.
.3 MTO and MOT - Ontario Ministry of Transportation.
- 1.6 INTERNATIONAL GOVERNMENT DEPARTMENTS AND AGENCIES .1 DOHMH - New York City Department of Health and Mental Hygiene, USA.
.2 GSA - Government Services Administration, USA.
- 1.7 UNITS OF MEASURE METRIC .1 The following abbreviations of units of measure are commonly found in the Project Manual:
.1 C: Celsius.
.2 cm: centimetre.
.3 kg: kilogram.
.4 kg/m³: kilogram per cubic metre.
.5 kN: kilonewton.
.6 kPa: kilopascals.
.7 kw: kilowatts.
.8 l/s: litre per second.
.9 m: metre.
.10 m³: cubic metre.
.11 mg/kg: milligrams per kilogram.
.12 mg/L: milligrams per litre.
.13 mm: millimetres.
.14 mt: metric tonnes.
.15 MPa: megapascal.
.16 NTU: nephelometric turbidity unit.
.17 ppm: parts per million.
.18 ug/L: micrograms per litre.
.19 ug/m³: micrograms per cubic metre.
- 1.8 UNITS OF MEASURE IMPERIAL .1 The following abbreviations of units of measure are commonly found in the Project Manual:
.1 F: Fahrenheit.
.2 ft: foot/feet.
.3 ga: guage.
.4 gpm: gallons per minute.
.5 in: inches.
.6 lbs: pounds.
.7 NTU: nephelometric turbidity unit.
.8 psi: pounds-force per square inch.
.9 ppm: parts per million.
-

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

<u>1.1 SECTION INCLUDES</u>	.1	Barriers.
	.2	Environmental Controls.
	.3	Traffic Controls
	.4	Fire Routes
<u>1.2 MEASUREMENT PROCEDURES</u>	.1	Supply and installation of erosion and sediment control measures for environmental protection for all work, maintenance of sediment control measures during work, and removal of erosion and sediment control measures after all work is completed will be measured as part of the lump sum.
<u>1.3 REFERENCES</u>	.1	Canadian General Standards Board (CGSB): .1 CAN/CGSB-1.189-2000, Exterior Alkyd Primer for Wood. .2 CAN/CGSB-1.59-97, Alkyd Exterior Gloss Enamel.
	.2	Canadian Standards Association (CSA): .1 CAN/CSA-O121-M1978(R2003), Douglas Fir Plywood.
<u>1.4 INSTALLATION AND REMOVAL</u>	.1	Provide temporary controls in order to execute Work expeditiously.
	.2	Remove from site all such work after use.
<u>1.5 EROSION AND SEDIMENT CONTROL</u>	.1	Plan and execute construction by methods to control surface drainage from cuts and fills, from 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

1.5 EROSION AND
SEDIMENT CONTROL
(Cont'd)

- .2 (Cont'd)
systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by Departmental Representative.
- .3 Provide and maintain temporary measures which may include, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, vegetative cover, and other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Regulations. Make sediment control measures available during construction. Place silt fences and/or hay or straw bales in ditches to prevent sediments from escaping from ditch terminations.
- .4 Plan construction procedures to avoid damage to work or equipment encroachment onto water bodies or drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank or water body to existing condition.

1.6 GUARD RAILS AND
BARRICADES

- .1 Provide secure barricades at top of deep slopes.
- .2 Provide as required by governing authorities on land and marine vessels.

1.7 ACCESS TO SITE

- .1 Provide and maintain haul and access roads, ramps and construction runways as may be required for access to Work.
 - .2 Construct haul and access roads necessary to complete work.
 - .3 Haul Roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic should be avoided.
 - .4 Location, grade, width and alignment of access and hauling roads subject to approval by Departmental Representative.
 - .5 Remove upon completion of work, haul and access roads designated by Departmental Representative
-

1.8 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.

1.9 PUBLIC TRAFFIC FLOW .1 Provide and maintain competent signal flag operators, traffic signals, barricades and flares, lights, or lanterns as required to perform Work and protect the public.

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

1.11 PROTECTION OF FINISHES .1 Provide protection for building finishes, site furnishings and equipment during performance of Work.

.2 Provide necessary screens, covers and hoardings.

.3 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.

.4 Be responsible for damage incurred due to lack of or improper protection.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Hay or Straw Bale: wire bound or string tied; securely anchored by at least 2 stakes or rebars driven through bale 300 mm to 450 mm into ground; chinked (filled by wedging) with hay or straw to prevent water from escaping between bales; and entrenched a minimum of 100 mm into ground.

.2 Silt Fence: assembled, ready to install unit consisting of geotextile attached to driveable posts. Geotextile: uniform in texture and appearance, having no defects, flaws, or tears that would affect its physical properties; and contain sufficient ultraviolet ray inhibitor and stabilizers to provide minimum 2-year service life from outdoor exposure.

2.1 MATERIALS
(Cont'd)

- .3 Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.
- .4 Posts: sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Construct temporary erosion control items as required. Actual alignment and/or location of various items as directed by Departmental Representative.
- .2 Do not construct bale barriers and silt fence in flowing streams or in swales.
- .3 Check erosion and sediment control measures weekly or after each rainfall; during prolonged rainfall check daily.
- .4 Bales and/or silt fence may be removed at beginning of work day, replace at end of work day at the discretion of Departmental Representative.
- .5 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.
- .6 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, 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.
- .7 Repair damaged bales, end runs, and undercutting beneath bales.

- 3.1 INSTALLATION
(Cont'd)
- .8 Unless otherwise directed by Departmental Representative, 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.
- .9 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.
- .10 Do not disturb existing embankments or embankment protection.
- .11 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.
- .12 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.

PART 1 - GENERAL

- 1.1 SUMMARY
- .1 Section includes clearing and grubbing of trees and shrubs, the removal of dumpsite debris, contaminated soil removal and offsite disposal, and placement of backfill and topsoil.
 - .2 Site remediation work includes:
 - .1 Provide equipment required for soil removal.
 - .2 Transportation of all equipment, staff, clean fill, contaminated materials, to and from site as required.
 - .3 Co-ordination, supervision and preparation for removal of contaminated soil. Departmental Representative requires 1 week notice previous to the commencement of site work for provision of site supervision.
 - .4 Specification of final soil remediation design and facilities required.
 - .5 Provision and installation of materials and equipment necessary to remediate the site.
 - .6 Preparation of soil storage over layout and installation of associated equipment.
 - .7 Implementation of safety work zones, temporary barriers, site Health and Safety Plans and Emergency Response Plans.
 - .8 Removal of landfill material/debris to approximate depths of between 0 to 1.0 m below ground surface.
 - .9 Clear and grub. Removal of a surficial layer of approximately 200 mm of hazardous and non-hazardous contaminated soil to bedrock.
 - .10 Management of contaminated soil.
 - .11 Backfilling of excavations with sand fill and topsoil and grading of excavations to match existing grade.
- 1.2 MEASUREMENT PROCEDURES
- .1 Clearing and grubbing of small trees and shrubs shall be measured in square meters of area cleared and grubbed at the site.
 - .1 Tree stumps and roots to be disposed of off site.
 - .2 Tree trunks and branches to be disposed of on site as directed by the Departmental Representative.
 - .2 Removal of dump site waste materials from three(3) dump sites shall be measured in metric tonnes of actual weight of materials removed. Measurement shall be based on the net weight of
-

1.2 MEASUREMENT PROCEDURES
(Cont'd)

- .2 (Cont'd)
materials removed from the site and substantiated by certified weigh bills from the landfill sites.
- .1 Remove and dispose of dump waste materials to the extent and limits as directed by Departmental Representative.
- .2 Price shall include: preparatory work including obtaining the required permits and certificates; quality control/quality assurance; other required equipment; implementation of safety work zones; removal; loading; required storage and delivery of wastes to an approved landfill or recycling facility.
- .3 Refer to Appendix 4 for description of the types of waste present at the landfill sites.
- .3 Removal and disposal of hazardous and non-hazardous lead contaminated soil shall be measured in metric tonnes of the actual weight of soil removed. Measurement shall be based on the net weight of contaminated soil delivered to the landfill sites and substantiated by certified weigh bills from the landfill facility.
- .1 Remove and dispose of contaminated soil to the extent and limits outlined in Figures 3 through 5 (Appendix 1) and as directed on site by Departmental Representative.
- .2 Screen out cobbles and boulders with a 50 mm screen and place as directed by the Departmental Representative.
- .3 Price shall include: preparatory work including obtaining the required permits and certificates; quality control/quality assurance; other required equipment; implementation of safety work zones; excavation; screening; loading; required storage and delivery of contaminated soil to an approved landfill facility.
- .4 Include working weekend hours if required to complete work by contract completion date.
- .4 Imported sand backfill material, will be measured as metric tonnes. Measurement shall be based on the net weight of clean sand fill delivered to the site and substantiated by certified weigh bills from the quarry / pit from which it came from. Clean sand backfill material shall be brought to the site, and placed in the remediated areas as directed on site by Departmental Representative.
- .1 Price to include grading, compaction, and costs to analyze fill. Imported fill to be analyzed and meet MOE Reg. 153/04 Table 1
-

1.2 MEASUREMENT
PROCEDURES
(Cont'd)

- .4 (Cont'd)
 - .1 (Cont'd)
standards for the following parameters: mercury,
barium, cadmium, copper, nickel, lead,
molybdenum, tin, zinc and PAHs.
- .5 Imported topsoil, free of toxic chemicals and
debris, complying with MOE Residential/Parkland
land use criteria, appropriate for supporting
intended plant growth, will be measured as a
unit price. Measurement shall be based on square
meters of compacted area covered by a compacted
100 mm layer of topsoil.
- .6 Bedrock shoreline and shallow water may prevent
direct access to the shore by barge. Additional
equipment required to transport equipment to and
from the site will be measured as part of the
lump sump price.
- .7 Mobilization to and demobilization from the
site will be measured as part of the lump sum
price. The site is accessible only by a wooden
dock for pedestrians and helipad.
- .8 Locating and protecting buried and aboveground
utilities, structures, and features will be
measured as part of the lump sum price

1.3 SUBMITTALS

- .1 Provide quality assurance and quality control
submittals in accordance with Section 01 11 06
as follows:
 - .1 Description of emergency plans in case of
breakdown, spill or other problem.
 - .2 Complete the Environmental Assessment
Mitigation Monitoring Report Form included as
Appendix 2.
 - .3 Waste management plan and complete list of
wastes, including waste registration numbers as
required by provincial regulations, that will be
generated by activities.
 - .4 Copies of transport manifests, trip
tickets, and landfill weigh bill receipts for
waste materials removed from work area.
 - .5 Detailed plan of soil remediation to be
supplied by Departmental Representative.
 - .6 Inform Departmental Representative 1 week
prior to beginning of work, of proposed source
of clean fill material.
 - .7 The Contractor shall provide the
Departmental Representative with a Certificate
of Analysis that the fill material to be used at
the site is clean and meets applicable
-

- 1.3 SUBMITTALS (Cont'd)
- .1 (Cont'd)
- .7 (Cont'd)
- Provincial (MOE Table 1, 2011)residential criteria.
- .1 Fill material is to be analyzed at a frequency of one sample per 100 metric tonnes.
- .2 Sand backfill material to be analyzed for mercury, barium, cadmium, copper, nickel, lead, molybdenum, tin, zinc and PAHs and must meet applicable provincial standards.
- .2 Provide closeout submittals as follows:
- .1 Provide written proof that contaminated soil has been sent to centre authorized by MOE for Province of Ontario.
- .2 Provide written proof that waste and debris have been sent to site authorized by MOE for Province of Ontario or eliminated according to level of contamination.
- 1.4 QUALITY ASSURANCE
- .1 Qualifications:
- .1 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 Identify members of project team. Define experience, education and training, qualifications, tasks and responsibilities of each team member. Supply résumés of key technical and management staff.
- .2 Regulatory requirements: 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; and waste management.
- .2 WHMIS.
- .3 Canadian Environmental Assessment Act.
- .4 Canadian Environmental Protection Act (New Substance Notification Regulations).
- .5 Transportation of Dangerous Goods Act.
- .6 National Building Code of Canada.
- .7 National Fire Code of Canada.
- .8 The Fisheries Act.
- .9 Migratory Birds Convention Act.
- .10 Migratory Birds Regulations.

- 1.4 QUALITY ASSURANCE (Cont'd)
- .2 Regulatory requirements:(Cont'd)
- .11 Environmental Protection Act (Ontario) O. Reg. 153/04 (as amended), O. Reg. 347 (as amended).
- .12 Species at Risk Act (SARA).
- .3 Acceptance of topsoil subject to inspection and/or soil analysis test results. Do not commence work until topsoil accepted by Departmental Representative
- 1.5 DELIVERY, STORAGE, AND HANDLING
- .1 Contaminated soil:
- .1 Store excavated, contaminated soil as determined by Departmental Representative in drums or flexible intermediate bulk container bags with plastic liners. Cover stored contaminated soil with a flexible impervious membrane (polyethylene liner - 1 mm or heavier) to minimize cross contamination due to water run-off and wind erosion and underlay contaminated soil with flexible membrane to minimize or prevent leaching losses. Transport and dispose of contaminated soil and water according to current provincial regulations.
- .2 Separate cobbles, stones and boulders from contaminated soil using a 50 mm screen. Conduct sieving/screening of soils over an impermeable membrane as directed by the Departmental Representative, to minimize cross contamination due to screening activities.
- .3 Store non-contaminated soil excavated by drilling or trenching only on non-contaminated site surface areas. Ensure no contact between non-contaminated excavated soil and drainage or contaminated water or contaminated soil.
- .2 New materials and equipment:
- .1 Ship, store and preserve in original packaging with manufacturer's seal and label remain intact.
- .2 Ensure materials and equipment are not damaged, altered or soiled during shipment, handling and storage.
- .3 Transport rejected equipment and materials from work site immediately.
- .4 Store materials and equipment according to manufacturer's and supplier's instructions.
- .5 Establish quality management system for materials and equipment.
-

- 1.6 PROJECT/SITE CONDITIONS
- .1 Environmental Requirements:
 - .1 Review of environmental assessment to be completed by Departmental Representative.
 - .2 Existing Conditions: removal of contaminated soil;
 - .1 Set area aside for temporary storage of contaminated soils.
 - .2 Protect non-contaminated material from adjacent contaminated soil.

- 1.7 SEQUENCING
- .1 Clearing and grubbing of the work area will include vegetation removal and the removal of debris from the three (3) landfill sites. Removal of debris and contaminated soils from landfill is to be completed following the clearing and grubbing of the site.
 - .2 Decontaminate equipment used in remediation procedures before removing equipment from job site.

- 1.8 MAINTENANCE OF ACCESS ROADS
- .1 Unless otherwise directed, maintain access roads as follows:
 - .1 Maintain and clean roads/paths/docks for duration of Work.
 - .2 Repair damage incurred from use of roads/paths/docks.
 - .3 Provide photographic documentation of roads/paths used by construction vehicles before, during and after Work.

PART 2 - PRODUCTS

- 2.1 MATERIALS
- .1 Topsoil: horticultural loam, pH value 5.5 to 7.5.
 - .2 Sand: clean, washed, minimum 100% passing 4.75 mm sieve, maximum 5% passing 0.075 mm sieve to OPSS 1004.05.07.

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

- 2.2 EQUIPMENT (Cont'd)
- .2 Trucks and Marine Equipment: use watertight containment for transporting contaminated soil.
 - .3 Environmental emergency response equipment.
 - .4 Safety equipment.

PART 3 - EXECUTION

- 3.1 EQUIPMENT
- .1 Trucks:
 - .1 Clean meticulously between loads of contaminated soil and clean fill.
 - .2 Clean meticulously at end of Work.
 - .3 Cover truck boxes with tarpaulins during transportation.
 - .2 Marine Equipment: Prevent any spillage of soils during all transfers of soil over land or water.
 - .3 Equipment to be decontaminated in accordance with Section 01 35 43.

- 3.2 PREPARATION
- .1 Protection:
 - .1 The approximate extents of contaminated soil and landfills are outlined in Figures 3 through 5 Appendix 1.
 - .2 Keep excavation sites water free throughout work.
 - .3 Provide safety measures to ensure worker and public safety.
 - .4 Protect buried services that are required to remain undisturbed.

- 3.3 CLEARING AND GRUBBING
- .1 Dispose of tree roots and stumps off site. Tree trunks and branches to be disposed of on site as directed by Departmental Representative.

- 3.4 APPLICATION
- .1 Soil Management:
 - .1 Store, transport, and dispose off-site in accordance with applicable provincial standards, requirements and regulations.
 - .2 Do not dilute contaminated soil with less contaminated soil.
-

- 3.4 APPLICATION (Cont'd)
- .2 Landfill materials/debris management:
.1 Store, transport, and dispose off-site in accordance with applicable provincial standards, requirements and regulations.
- 3.5 METHOD OF REMEDIATION
- .1 Contaminated/volatile waste: store in covered metal containers.
- .2 Hazardous waste: dispose of in accordance with regulations.
- .3 Use removal and off-site disposal for contaminated soil. Soil removal and off-site disposal shall be completed by Contractor and supervised by Departmental Representative. Removal and off-site disposal of contaminated soils in accordance with applicable federal and provincial regulations.
- .4 Dump Site Removal.
.1 Remove refuse debris from the three (3) dump sites identified. Recyclable items (i.e. metal, unpainted wood, glass) shall be separated from non-recyclable materials where possible. Refuse and contaminated soil removal and off-site disposal shall be completed by Contractor and supervised by Departmental Representative. Removal and off-site disposal of refuse and soils containing refuse in accordance with applicable federal and provincial regulations.
.2 Remove only soils mixed with refuse below and around landfill sites at the discretion of the Departmental Representative. These soils are to be handled as contaminated soils.
- .5 Soil removal and off-site disposal.
.1 Excavate contaminated soils so as to prevent contamination of non-contaminated soils. Underlay and tarp contaminated soils stored in watertight drums or soil bags with a flexible membrane (polyethylene liner - 1 mm or heavier).
.2 Screen cobbles and boulders from soil using a 50 mm screen and place as directed by Departmental Representative.
.3 Remove contaminated soils from the landfill sites down to bedrock and from crevices as directed by Departmental Representative.
- .6 Assist the Departmental Representative in the collection of confirmatory soil samples to verify that all contaminated soil has been removed. Protect excavation at all times until
-

- 3.5 METHOD OF
REMEDICATION
(Cont'd) .6 (Cont'd)
Departmental Representative authorizes the Contractor to backfill the area. Allow three (3) working days for analysis.
- 3.6 RESTORATION .1 Backfill and grade excavations to match adjacent natural grade and maintain proper drainage.
.1 Backfill and compact excavation to within 100 mm below original grade with sand.
.2 Backfill remaining depth with compacted topsoil to match surrounding grade.
.2 Re-instate surface grading to give site same appearance as before remediation work.
.3 Clean access and haul roads of contamination resulting from project activity.
- 3.7 FIELD QUALITY
CONTROL .1 Site Tests:
.1 Ensure Toxicity Characteristic Leaching Procedure results for contaminated soils conform to hazardous waste regulations.
.2 Remove and replace non-compliant materials.
- 3.8 EQUIPMENT
DECONTAMINATION .1 Decontaminate equipment used in remediation process and remove from site at end of remediation activities.
- 3.9 ENVIRONMENTAL
PROTECTION .1 While executing the project, implement the mitigation measures identified in the Environmental Assessment (EA) Screening Report (Appendix 2) prepared in accordance with the Canadian Environmental Assessment Act (CEAA) for this project. Complete the Mitigation Monitoring Report Form contained herein and submit it to the Departmental Representative upon completion of the project.
.2 Work to be done in accordance with Contractor Environmental Protection Plan. Refer to Section 01 35 43.

PART 1 - GENERAL

- 1.1 SUMMARY .1 Comply with requirements of this Section when performing following Work: Type 1 Operation.
- .1 Set-up of Work area.
 - .2 Removal of metal siding from the Light Station and Residence Building for possible re-installation.
 - .3 Removal of lead-based and low concentration PCB containing coatings with a chemical gel or paste and fibrous laminated cloth wrap on exterior and interior surfaces as indicated on drawing.
 - .4 Removal of lead-based and low concentration PCB containing coatings or materials using a power tool with an effective dust collection system equipped with a HEPA filter on exterior and interior surfaces as indicated on drawing.
 - .5 Removal of lead-based and low concentration PCB containing coatings or materials with non-powered hand tool, other than manual scraping and sanding on exterior and interior surfaces as indicated on drawings.
 - .6 Dispose of all removed paint at a licensed facility in accordance to regulations.
 - .7 Repainting of abated surfaces to match original paint colour scheme or as directed by the Departmental Representative.
 - .8 Replacement with salvaged or new siding to match original work.
 - .9 Salvaged aluminum siding to be reused must be of acceptable condition to the Departmental Representative.
 - .10 Repainting of trim to match original paint colour scheme
- 1.2 REFERENCES .1 Province of Ontario - Ontario Ministry of Labour.
- .1 Occupational Health and Safety Branch, Guideline Lead On Construction Projects, September 2004, and O. Reg. 490/09 respecting Designated Substances - Lead made under the Occupational Health and Safety Act as amended by O. Reg. 148/12 and O. Reg. 149/12; and O.Reg 833/90 respecting the Control and Exposure to Biological or Chemical Agents as amended.
- .2 Ontario Ministry of Environment (MOE)
-

- 1.2 REFERENCES (Cont'd)
-
- .2 (Cont'd)
- .1 Protocol for Sampling and Testing at PCB Storage Sites in Ontario, 2000 (ISBN 0-7794-0020/PIBS 4049e).
- .3 Department of Justice Canada
- .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 Health Canada
- .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .5 Human Resources and Social Development Canada (HRSDC)
- .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .6 Transport Canada (TC)
- .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .7 U.S. Environmental Protection Agency (EPA)
- .1 EPA 747-R-95-007-1995, Sampling House Dust for Lead.
- .8 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
- .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
- .9 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
- .1 Lead in Construction Regulation - 29 CFR 1926.62-1993.
- .10 Underwriters' Laboratories of Canada (ULC)
- .11 American National Standards Institute (ANSI). American Society of Mechanical Engineers (ASME)
- .1 ANSI/ASME B18.6.3-[2010], Machine Screws, Tapping Screws, and Metallic Drive Screws (Inch).
- .12 American Society for Testing and Materials International, (ASTM).
- .1 ASTM D2369 10, Test Method for Volatile Content of Coatings.
- .2 ASTM D2832-[92(2005)], Standard Guide for Determining Volatile and Nonvolatile Content of Paint and Related Coatings.
-

1.2 REFERENCES
(Cont'd)

- .12 (Cont'd)
 - .3 EnASTM D5116-10, Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.
- .13 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB 51 1.32 M77, Sheathing, Membrane, Breather Type.
 - .2 CAN/CGSB 93.2 M91, Prefinished Aluminum Siding, Soffits and Fascia, for Residential Use.
 - .3 CAN/CGSB 93.3 M91, Prefinished Galvanized and Aluminum Zinc Alloy Steel Sheet for Residential Use.
 - .4 CAN/CGSB 93.4 92, Galvanized and Aluminum Zinc Alloy Coated Steel Siding Soffits and Fascia, Prefinished, Residential.
 - .5 CGSB 93.5 92, Installation of Metal Residential Siding, Soffits and Fascia.
- .14 Canadian Standards Association (CSA International).
 - .1 CSA B111 1974(R2003), Wire Nails, Spikes and Staples.
- .15 Environmental Choice Program (ECP).
 - .1 CCD 045 95, Sealants and Caulking Compounds.
- .16 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN/ULC18-S706-02, Wood Fibre Thermal Insulation for Buildings.

1.3 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
 - .2 Authorized Visitors: Departmental Representative or designated representatives.
 - .3 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.
 - .4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing
-

1.3 DEFINITIONS
(Cont'd)

- .4 Sprayer:(Cont'd)
mist or fine spray. Must be appropriate capacity for scope of work.
- .5 Action level: employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/m³) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic metre of air for removal of lead based paint by methods noted in paragraph 1.1.
- .6 Competent person: individuals capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.
- .7 Lead dust: wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.4 MEASUREMENT
PROCEDURES

- .1 All work required to remove and dispose of the lead based and low PCB containing coating by Type 1 operations and repainting will be paid by the square metre of area.
- .2 All work for the removal and reinstallation of salvaged or new aluminum siding will be paid for as part of the lump sum price.
- .3 Construct all other work of this section under lump sum price.

1.5 SUBMITTALS

- .1 Provide submittals in accordance with Section 01 11 06.
 - .2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
 - .3 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of paint with low PCB concentration.
-

- 1.5 SUBMITTALS
(Cont'd)
- .3 (Cont'd)
- .1 Landfill operator to be notified of low PCB concentration and confirmation obtained for acceptance of waste.
- .4 Provide proof of Contractor's General and Environmental Liability Insurance.
- .5 Quality Control:
- .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that lead based paint waste has been received and properly disposed.
- .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, and aspects of work procedures and protective measures.
- .3 Submit product data sheets and MSDS for sealant and caulking used during siding application and curing.
- .4 Submit manufacturer's written application instructions for encapsulant and siding.
- .5 Submit 100 x 100 mm sample of siding material of colour and profile to match existing.
- 1.6 QUALITY ASSURANCE
- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead materials, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
- .1 Do construction occupational health and safety in accordance with Section 01 35 29.
- .2 Safety Requirements: worker and visitor protection.
- .1 Protective equipment and clothing to be worn by workers and visitors in work Area include:
- .1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of 10, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters.
-

- 1.6 QUALITY ASSURANCE (Cont'd)
- .2 Health and Safety:(Cont'd)
- .2 Safety Requirements:(Cont'd)
- .1 (Cont'd)
- .2 Half mask respirator: half-mask particulate respirator with N, R, or P - series filter, and 95, 99 or 100% efficiency could be provided.
- .3 Eating, drinking, chewing, and smoking are not permitted in work area.
- .4 Ensure workers wash hands and face when leaving work area. Facilities for washing are to be provided by contractor.
- .2 Visitor Protection:
- .1 Provide approved respirators to Authorized Visitors to work areas.
- .2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.
- 1.7 WASTE MANAGEMENT AND DISPOSAL
- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Provincial and Municipal regulations.
- .2 Separate waste materials for reuse and recycling where possible.
- .3 Disposal of lead waste generated by removal activities must comply with Federal, Provincial and Municipal regulations. Dispose of lead waste in sealed double thickness 0.152 mm thick bags or leak proof drums. Label containers with appropriate warning labels.
- .1 Lead-based paint containing low concentration of PCBs to be disposed of in separate sealed double thickness 0.152 mm thick bags or leak proof drums. Label containers with warning labels indicating lead and PCB content with PCB concentration stated on the label.
- .4 Contractor to conduct toxicity characteristic leaching procedure (TCLP) analysis on lead based paint waste to determine waste classification disposal procedures. A copy of laboratory analysis is to be provided to Departmental Representative.
- .5 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.
-

1.10 OWNER'S
INSTRUCTIONS
(Cont'd)

- .2 Instruction and training related to respirators includes, at minimum:
 - .1 Proper fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Polyethylene 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
 - .2 Polyethylene 6 mm thick unless otherwise specified; in sheet size to minimize joints.
 - .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
 - .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual lead paint residue.
 - .5 Lead waste containers: metal or fibre type acceptable to landfill operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .1 Label containers with pre-printed bilingual cautionary "Warning Lead" clearly visible when ready for removal to disposal site.
 - .6 Lead/Low-Concentration PCB waste containers: metal or fibre type acceptable to landfill operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .1 Label containers with pre-printed bilingual cautionary "Warning Lead/PCB (3.7mg/kg)" clearly visible when ready for removal to disposal site.
 - .7 Replacement Boards: to match existing grade, quality and thickness.
-

2.1 MATERIALS
(Cont'd)

- .8 Strip siding: to CAN/CGSB 93.2 to match existing.
 - .1 Colour: to match existing.
 - .2 Gloss: to match existing.
 - .3 Profile: to match existing.
 - .4 Thickness: to match existing.
 - .5 Backing: wood fibre composite board Type II to CAN/ULC S706 12.5 mm thick underlain by spun-bonded polyolefin(Tyvek)paper.
- .9 Exposed trim: inside corners, outside corners, cap strip, drip cap, undersill trim, starter strip and window/door trim of same material, colour and gloss as original siding, with fastener holes pre punched.
- .10 Nails: CSA B111. Screws: ANSI B18.6.4. Purpose made aluminum alloy.
- .11 Caulking Sealant: Tested for acceptable VOC emissions in accordance with ASTM D2369 and ASTM D2832.
- .12 Trim Paint: materials and procedures to conform to Master Painters Institute (MPI) requirements.
 - .1 Submit proposed colour schedule to Departmental Representative for review.
 - .2 Galvanized Metal (top of light tower structure)
 - .1 REX 5.3B - Alkyd (Flat Gloss)
 - .3 Wood (Railings and Trim)
 - .1 REX 6.3B - Alkyd (Flat Gloss)

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 One Supervisor for every ten workers is required.
- .2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

3.2 PREPARATION

- .1 Remove and store tems to be salvaged or reused.
 - .1 Protect and wrap items and transport and store in area specified by Departmental Representative.
 - .2 Work Area:
 - .1 Shut off and isolate HVAC system to prevent dust dispersal into other buildings.
-

- 3.2 PREPARATION .2 Work Area:(Cont'd)
(Cont'd) .1 (Cont'd)
Ensure windows and doors are closed and sealed to prevent dust from entering into buildings. Conduct smoke tests to ensure duct work is airtight.
- .2 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise dust.
- .3 Seal off openings with polyethylene sheeting and seal with tape.
- .4 Protect floor surfaces covered from wall to wall with polyethylene sheets.
- .5 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.
- .6 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized for application of water as required.
- .7 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .8 Lay an impervious polyethylene 6 mm thick tarp around the base of the buildings to collect any paint chips and debris resulting from loose paint removal.
- .9 All work shall be performed to applicable codes, bylaws and standards governing this project.
- .3 Do not start work until:
- .1 Arrangements have been made for disposal of waste.
- .2 Tools, equipment, and materials waste containers are on site.
- .3 Arrangements have been made for building security.
- .4 Notifications have been completed and preparatory steps have been taken.
- 3.3 LEAD ABATEMENT .1 Removal of lead-based and low concentration PCB containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal with using power tools equipped with HEPA filters, or non-powered hand tool, other than manual scraping and sanding.
- .2 Remove lead based and low concentration PCB paint in sections and pack as it is being
-

- 3.3 LEAD ABATEMENT .2 (Cont'd)
(Cont'd)
- removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.
- .3 Replace rotting or damaged boards on walls or trim to match original as required.
- .4 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .5 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .6 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Do not disturb work area for 8 hours no entry, activity, ventilation, or disturbance during this period.
- 3.4 INSPECTION .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
- .1 Adherence to specific procedures and materials.
- .2 Final cleanliness and completion.
- .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.
-

3.5 LEAD SURFACE
SAMPLING - WORK
AREAS

- .1 Final lead and PCB surface sampling to be conducted as follows:
- .1 After work area has passed a visual inspection for cleanliness approved and accepted by Departmental Representative and following application of lock-down agent to surfaces and the appropriate settling period of 8 hours has passed, Departmental Representative will perform lead wipe sampling.
- .1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.
- .2 Final PCB wipe sampling results from horizontal and vertical surfaces must show PCB levels of less than 10 micrograms of PCB in dust per 100 centimetres squared. Samples collected and analyzed in accordance with MOE PIBS 4049E.
- .3 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot or PCBs in excess of 100 micrograms per 100 square centimetres, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
- .4 Repeat as necessary until lead levels are less than 40 micrograms per square foot and PCBs are less than 100 micrograms per 100 square centimeters.

3.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead and PCB wipe sampling is below acceptable concentrations proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from edges to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.
-

- 3.7 PAINT
- .1 Protect adjacent surfaces from damage and overspray.
 - .2 Following application of lockdown and acceptance by Departmental Representative, repaint abated surfaces to match original paint colour scheme.
 - .1 Where abated surfaces are to be covered by siding material, repainting is not required.
 - .3 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage installation instructions, and data sheets.
 - .4 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
 - .5 Place "WET PAINT" signs in occupied areas as operations progresses.
 - .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
 - .7 Paint only after prepared surfaces have been accepted by Departmental Representative.
 - .8 Apply paint by brush, roller or airless sprayer in accordance with paint manufacturer's written instructions.
 - .9 Repaint encapsulated trim surfaces to match original paint colour scheme.
 - .10 Place paint defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.
- 3.8 SIDING
INSTALLATION
- .1 Install cladding in accordance with CGSB 93.5, and manufacturers written instructions using salvaged or new materials to match original.
 - .2 Install one layer exterior wall sheathing paper horizontally by stapling or nailing, lapping edges a minimum of 150 mm.
-

- 3.8 SIDING
INSTALLATION
(Cont'd)
- .3 Install wall composite board backing by nailing.
 - .4 Install continuous starter strips inside and outside corners, edgings, soffit, drip, cap, sill and window/door opening flashings to match original.
 - .5 Install outside corners, fillers and closure strips with carefully formed and profiled work.
 - .6 Install soffit and fascia cladding to match original. Maintain joints in exterior cladding, true to line, tight fitting, hairline joints.
 - .7 Attach components in manner not restricting thermal movement.
 - .8 Caulk junctions with adjoining work with sealant.
- 3.9
RE-ESTABLISHMENT
OF OBJECTS AND
SYSTEMS
- .1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

PART 1 - GENERAL

- 1.1 SUMMARY .1 In the event that Type 1 Operations are not adequate, as confirmed by Departmental Representative, comply with requirements of this Section when performing following Work Type: 2a Operation.
- .1 Removal of exterior and interior lead based and low concentration PCB containing paint from areas indicated on drawings by scraping or sanding using non-powered hand tools.
- .2 Repainting of abated surfaces to match original paint colour scheme or as directed by Departmental Representative.
- 1.2 SECTION INCLUDES .1 Requirements and procedures for abatement of lead based and low concentration PCB containing paints from the exterior and interior of three (3) on-site structures:
- .1 Light Keeper's Residence (interior).
- .2 Lighthouse (interior and exterior).
- .3 Boathouse (exterior).
- 1.3 REFERENCES .1 Ontario Ministry of Labour
- .1 Occupational Health and Safety Branch, Guideline Lead On Construction Projects, September 2004; O. Reg. 490/09 respecting Designated Substances made under the Occupational Health and Safety Act as amended by O. Reg. 148/12 and O. Reg. 149/12; and O.Reg. 833/90 respecting Control of Exposure to Biological and Chemical Agents, as amended.
- .2 Department of Justice Canada
- .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada
- .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC)
- .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
-

1.3 REFERENCES
(Cont'd)

- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007-1995, Sampling House Dust for Lead.
- .7 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
- .8 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
 - .1 Lead in Construction Regulation - 29 CFR 1926.62-1993.
- .9 Underwriters' Laboratories of Canada (ULC)
- .10 Ontario Ministry of the Environment
 - .1 Protocol for Sampling and Testing at PCB Storage Sites in Ontario, 2000 (ISBN 0-7794-0020-8/PIBS 4049e).

1.4 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
 - .2 Authorized Visitors: Departmental Representative or designated representatives and representatives of regulatory agencies.
 - .3 Occupied Area: areas of building or work site that is outside Work Area.
 - .4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.
 - .5 Airlock: ingress or egress system, without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.
-

1.4 DEFINITIONS
(Cont'd)

- .6 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows:
- .1 Place two overlapping polyethylene sheets over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one sheet along one vertical side of doorway, and secure other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
- .7 Action level: employee exposure, without regard to usage of respirators, to an airborne concentration of lead or PCBs of 50 micrograms per cubic meter of air calculated as 8 hour time-weighted average (TWA). Intermediate precautions for lead abatement are based on airborne lead concentrations greater than 0.05 milligrams per cubic meter of air within Work Area.
- .8 Competent person: Individuals capable of identifying existing lead or PCB hazards in workplace and taking corrective measures to eliminate them.
- .9 Lead in Dust: wipe sampling on vertical and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.
- .10 PCBs in Dust: wipe sampling on vertical and/or horizontal surfaces, dust and debris is considered to be PCB contaminated if it contains more than 10 micrograms of PCBs in dust per 100 square centimeters.

1.5 MEASUREMENT
PROCEDURES

- .1 All work required to remove and dispose of the lead based and low PCB containing coating by Type 2a operations and repainting will be paid for by the square metre of area.
- .2 All work for the removal and reinstallation of salvaged or new aluminum siding will be paid for under the lump sum price.
- .3 Construct all other work of this section under lump sum price.

- 1.6 SUBMITTALS
- .1 Provide submittals in accordance with Section 01 11 06.
 - .2 Provide drawings indicating proposed layout of decontamination system enclosures and barrier systems to be used during the work.
 - .1 Drawings to be submitted to Departmental Representative three (3) days prior to the start of abatement work.
 - .3 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
 - .4 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of paint with low PCB concentration.
 - .1 Landfill operator to be notified of low PCB concentration and confirmation obtained for acceptance of waste.
 - .5 Provide: Provincial and local requirements for Notice of Project Form.
 - .6 Provide proof of Contractor's General and Environmental Liability Insurance.
 - .7 Quality Control:
 - .1 Provide Departmental Representative necessary permits for transportation and disposal of lead and PCB based paint waste and proof that it has been received and properly disposed.
 - .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead and PCB exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
 - .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two days duration, approved by Departmental Representative. Minimum of one supervisor for every ten workers.
 - .8 Product data:
 - .1 Provide documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 Encapsulants.
 - .2 Amended water.
-

1.6 SUBMITTALS .8 Product data:(Cont'd)
(Cont'd) .1 (Cont'd)
.3 Slow drying sealer.

1.7 QUALITY .1 Regulatory Requirements: comply with Federal,
ASSURANCE Provincial and local requirements pertaining to
lead and PCB containing materials, in case of
conflict among those requirements or with these
specifications more stringent requirement
applies. Comply with regulations in effect at
time work is performed.

.2 Health and Safety:
.1 Do construction occupational health and
safety in accordance with Section 01 35 29.
.2 Safety Requirements: worker and visitor
protection.
.1 Protective equipment and clothing to
be worn by workers and visitors in Work
Area includes:
.1 Respirator NIOSH approved and
equipped with filter cartridges with
assigned protection factor of 50,
acceptable to Authority having
jurisdiction. Suitable for type of
lead and PCBs and and level of lead
and PCB dust exposure in Work Area.
Provide sufficient filters so workers
can install new filters following
disposal of used filters and before
re-entering contaminated areas.
.2 Disposable type protective
clothing that does not readily retain
or permit skin contamination,
consisting of full body covering
including head covering with snug
fitting cuffs at wrists, ankles, and
neck.
.2 Requirements for workers for Type 2a
interior abatement:
.1 Remove street clothes in clean
change room and put on respirator with
new filters or reusable filters, clean
coveralls and head covers before
entering Equipment and Access Rooms or
Work Area. Store street clothes,
uncontaminated footwear, towels, and
similar uncontaminated articles in
clean change room.
.2 Remove gross contamination from
clothing before leaving work area.
Place contaminated work suits in
receptacles for disposal with other

1.7 QUALITY ASSURANCE (Cont'd)	.2 Health and Safety:(Cont'd)
	.2 Safety Requirements:(Cont'd)
	.2 (Cont'd)

lead and PCB contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in Work Area, store work footwear in Equipment and Access Room. Upon completion of lead/PCB abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from Work Area or from Equipment and Access Room.

.3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not to use this system as means to leave or enter work area.

.4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead and PCB abatement.

.5 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.

.3 Eating, drinking, chewing, and smoking are not permitted in Work Area.

.4 Ensure workers wash hands and face when leaving Work Area. Facilities for washing are to be provided by contractor.

.5 Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.

.6 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to Work Areas.

.2 Instruct Authorized Visitors in use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.8 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Provincial and Municipal regulations.
- .2 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, and Municipal regulations. Dispose of lead and PCB waste in sealed double thickness 0.152 mm thick bags or leak proof drums. Label containers with appropriate warning labels.
 - .1 Lead-based paint containing low concentration of PCBs to be disposed of in separate sealed double thickness 0.152 mm thick bags or leak proof drums. Label containers with warning labels indicating lead and PCB content with PCB concentration stated on the label.
- .3 Contractor to conduct toxicity characteristic leachate procedure (TCLP) analysis on lead and lead/PCB wastes to determine waste classification for disposal purposes. A copy of the laboratory analysis to be provided to Departmental Representative.
- .4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill or destruction facility.

1.9 EXISTING
CONDITIONS

- .1 Information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this project are included as Figure 2 of Appendix 1.
 - .1 Paint containing low concentrations of PCBs has been identified in lavender coloured paint located on the main floor of the Light Keeper's Residence.
 - .2 Concentration of PCBs in the lavender paint is 3.7 mg/kg.
- .2 Notify Departmental Representative of lead or PCB based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.10 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify the following in writing, where appropriate:
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
-

PART 3 - EXECUTION

- 3.1 SUPERVISION .1 Approved Supervisor must remain within Lead and PCB Work Area during disturbance, removal, or other handling of lead and PCB based paints.
- 3.2 PREPERATION .1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.
- .2 Work Area:
- .1 Shut off and isolate HVAC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.
- .2 Pre-clean fixed casework, and equipment within work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
- .3 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum.
- .4 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
- .5 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
- .6 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.
- .7 At point of access to work areas install warning signs in both official languages in upper case "Helvetica Medium" letters reading as follows where number in parentheses indicates font size to be used:
- .1 CAUTION LEAD AND PCB HAZARD AREA (25 mm).
- .2 NO UNAUTHORIZED ENTRY (19 mm).
- .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm).
- .4 BREATHING LEAD AND PCB CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).
- .8 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.
- .9 Where water application is required for wetting lead and PCB containing materials, provide temporary water supply by use of
-

3.2 PREPERATION
(Cont'd)

- .2 Work Area:(Cont'd)
 - .9 (Cont'd)
appropriately sized hoses for application of water as required.
 - .10 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical lines and equipment.
- .3 Worker Decontamination Enclosure System:
 - .1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:
 - .1 Equipment and Access Room: construct between exit and work areas, with two curtained doorways, one to the rest of suite, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change comfortably.
 - .2 Clean Room: construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Construction of Decontamination Enclosures:
 - .1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two layers of FR polyethylene on floor.
 - .2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.
- .5 Separation of Work Areas from Occupied Areas
 - .1 Barriers between Work Area and occupied area to be constructed as follows:
 - .1 Construct floor to ceiling lumber stud framing, cover with polyethylene sheeting and seal with duct tape. Apply plywood over polyethylene sheeting. Seal plywood joints and between adjacent

3.2 PREPERATION .5 (Cont'd)
(Cont'd) .1 (Cont'd)

materials with surface film forming sealer, to create airtight barrier.

.2 Cover plywood with polyethylene sheeting and sealed with duct tape.

- .6 Maintenance of Enclosures:
- .1 Maintain enclosures in clean condition.
 - .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
 - .3 Visually inspect enclosures at beginning of each work day.
 - .4 Use smoke test method to test effectiveness of barriers as directed by Departmental Representative.

- 3.3 LEAD AND PCB .1 Removal of lead based and low concentration PCB
BASED PAINT containing paint to be performed by scraping or
ABATEMENT sanding using non-powered hand tools.
- .2 Remove lead based and low concentration PCB containing paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to Staging Area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead and PCB based paint, wet clean work area including equipment and access room, and equipment used in process. After inspection by Departmental Representative, apply continuous coat of slow drying sealer to surfaces. Do not

- 3.3 LEAD AND PCB .5 (Cont'd)
BASED PAINT disturb work for 8 hours with no entry,
ABATEMENT activity, ventilation or disturbance during this
(Cont'd) period.
- .6 After applying encapsulant to abated surfaces,
wet clean work area and equipment and access
room. During settling period no entry, activity,
or ventilation will be permitted.
- 3.4 INSPECTION .1 Perform inspection to confirm compliance with
specification and governing authority
requirements. Deviations from these requirements
not approved in writing by Departmental
Representative will result in work stoppage, at
no cost to Departmental Representative.
- .2 Departmental Representative will inspect work
for:
.1 Adherence to specific procedures and
materials.
.2 Final cleanliness and completion.
.3 No additional costs will be allowed by
Contractor for additional labour or materials
required to provide specified performance level.
- .3 When lead or PCB dust leakage from Work Area
occurs Departmental Representative may order
Work shutdown.
.1 No additional costs will be allowed by
Contractor for additional labour or materials
required to provide specified performance level.
- 3.5 LEAD AND PCB .1 Final lead and PCB surface sampling to be
SURFACE SAMPLING conducted as follows:
WORK AREAS .1 After Work Area has passed a visual
inspection for cleanliness approved by
Departmental Representative and acceptable coat
of lock-down agent has been applied to surfaces
within enclosure, and appropriate setting period
of 8 hours has passed, Departmental
Representative will perform lead and PCB wipe
sampling in Work Area.
.1 Final lead wipe sampling results from
horizontal and vertical surfaces where lead
based paints have been removed must show
lead levels of less than 40 micrograms of
lead in dust per square foot. Samples must
be collected and analyzed in accordance
with EPA 747-R-95-007. Where lead and PCB
-

3.5 LEAD AND PCB
SURFACE SAMPLING
WORK AREAS
(Cont'd)

- .1 (Cont'd)
- .1 (Cont'd)
- .2 Final PCB wipe sampling results from horizontal and vertical surfaces must show PCB levels of less than 10 micrograms of PCBs in dust per 100 square centimeters. Samples must be collected and analyzed in accordance with the Ontario Ministry of the Environment PIBS 4049e.
- .3 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot or PCB levels in excess of 10 micrograms per 100 square centimeters, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
- .4 Repeat as necessary until lead levels are less than 40 micrograms per square foot and PCBs are less than 10 micrograms per 100 square centimeters.

3.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead and PCB wipe sampling is below acceptable concentrations proceed with final cleanup.
 - .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead and PCB containing particles observed during cleanup, immediately, using HEPA vacuum equipment.
 - .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
 - .4 Clean-up Work Areas, Equipment and Access Room, and other contaminated enclosures.
 - .5 Clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
 - .6 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.
-

- 3.7 PAINT
- .1 Following application of lock down agent and acceptance by Departmental Representative, repaint abated surfaces to match original paint colour scheme.
 - .1 Where abated surface is to be covered by siding material, repainting is not required.
 - .2 Protect adjacent surfaces from damage and overspray.
 - .3 Comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage installation instructions, and data sheets.
 - .4 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to Departmental Representative damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.
 - .5 Place "WET PAINT" signs in occupied areas as operations progresses.
 - .6 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
 - .7 Paint only after prepared surfaces have been accepted by Departmental Representative.
 - .8 Apply paint by brush, roller or airless sprayer in accordance with paint manufacturer's written instructions.
 - .9 Place paint defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazaroud waste.
- 3.8 RE-ESTABLISH-MENT OF OBJECTS AND SYSTEMS
- .1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

PART 1 - GENERAL

- 1.1 MEASUREMENT PROCEDURES .1 Payment for tree/shrub replacement will be made at unit price per tree and shall include supply and application of soil amendments, including fertilizer. Departmental Representative to indicate which trees require replacement.
- 1.2 ENVIRONMENTAL CHOICE PROGRAM .1 Provide products bearing the 'Ecologo' of the Environmental Choice Program, Department of the Environment, Canadian Environmental Protection Act, Environmental Choice Product Guidelines ECP/PCE-69-94 Polyethylene Film Products.
- .2 Submit two copies of the licensing criteria statements and the verification of compliance with Sections 3(a) and 3(b) of the ECP to the Departmental Representative in accordance with Section 01 11 06. Alternatively, material in original containers bearing the 'Ecologo' or products bearing the 'Ecologo' will satisfy this requirement.

PART 2 - PRODUCTS

- 2.1 MATERIALS .1 Peatmoss or coconut fibre: decomposed plant material, 60% organic matter by weight, maximum 15% moisture content, maximum 6 mm particle size, pH value 4.5 to 6.0, brown colour.
- .2 Bonemeal: finely ground, raw, 4% nitrogen, 20% phosphoric acid.
- .3 Lime: ground, agricultural type, 85% carbonates.
- .4 Fertilizer: 10-6-4, 50% from organic source.
- .5 Water: potable.
- .6 Plant material: to "Canadian Standards for Nursery Stock", Canadian Nursery Trades Association, 2001:
- .1 Staghorn Sumac (*Rhus typhina*)
 - .2 Red Alder (*Alnus rubra*)
 - .3 Minimum stock height of 500mm and minimum trunk girth of 12mm.
-

- 2.1 MATERIALS
(Cont'd)
- .7 Stakes: wooden 50x50x1000mm to form a tripod buried in the ground.
 - .8 Cables and accessories: zinc coated, strength to withstand wind pressure, turnbuckles with 10 mm dia. threaded opening for adjustment.
 - .9 Guy wires: 4 mm galvanized malleable wire.
 - .10 Tree rings: 3.5 mm galvanized wire encased in 2 ply, reinforced, 25 mm diameter, rubber hose.
 - .11 Tree wrapping material: 150 mm wide burlap, 2.5 kg/m².
 - .12 Spray: appropriate to combat pests and disease, not prohibited by Agriculture Canada.

PART 3 - EXECUTION

- 3.1 PREPARATION
- .1 Plants: mix 3 parts topsoil, 1 part peatmoss, 3 kg/m³ bonemeal for plant beds.
- 3.2 LOCATION
- .1 Plant trees in areas as directed by Departmental Representative.
- 3.3 INSTALLATION
- .1 Planting:
 - .1 Excavate as required to carry out work.
 - .2 Minimum 170 mm deep planting beds.
 - .3 Planting holes dependent on sized of root ball. Holes shall be minimum 50 mm deeper and minimum 50 mm wider than root ball where possible.
 - .4 Keep excavations dry and frost free.
 - .5 Loosen 30 mm depth of soil in excavation bottom.
 - .6 Place 50 mm planting soil mix.
 - .7 Install plants vertically plumb.
 - .8 Cut and remove burlap from top of root ball only, without disturbing root ball.
 - .9 Place planting soil mix in 150 mm tamped layers.
 - .10 Fill 2/3 of hole with planting soil mix.
 - .11 Fill remainder of hole with water.
 - .12 Fill remainder of hole with planting soil mix after water penetrates soil. Top of bed to be flush with existing grade for all trees.
 - .13 Install stakes in excavation.

-
- 3.3 INSTALLATION (Cont'd)
- .1 Planting:(Cont'd)
 - .14 Build 100 mm lip around hole perimeter.
 - .15 Cover planting soil mix with 50 mm thickness of mulch.
 - .2 Tree supports: use 3 wooden stakes to form a tripod .
 - .1 Install tree rings above branch to prevent slipping at approximately 2/3 height for plants Collar mounting height not to exceed 0.5 m above grade.
 - .2 Tree rings to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through tree ring. Spread lead wires equally proportioned about trunk at 120 degrees.
 - .3 Attach guy wire to wooden stakes. Tension wire and secure.
 - .4 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.
 - .5 Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by Departmental Representative.
 - .6 After tree supports have been installed, remove broken branches with clean, sharp tools.
- 3.4 MAINTENANCE
- .1 Plants and Trees:
 - .1 Maintain plants and trees for twelve (12) months from date of planting.
 - .2 Cultivate and weed soil around plants and trees as required.
 - .3 Spray at appropriate time to combat pests and disease.
 - .4 Immediately remove plants and/or trees which fail to survive and replace in next planting season with new plants and/or trees to match existing.
 - .5 Extend warranty on replaced material for a period equal to original warranty period and continue replacement and extend warranty until work is acceptable.
 - .6 Remove guy wires, stakes and wrapping material at end of warranty period.

PART 1 - GENERAL

<u>1.1 RELATED SECTIONS</u>	.1	Section 02 61 00 - Removal and Disposal of Contaminated Soil.
<u>1.2 SECTION INCLUDES</u>	.1	Fertilizer, Watering, Seeding, Erosion Control Blanket and Warranty Period.
<u>1.3 MEASUREMENT PROCEDURES</u>	.1	Measure fertilizer, seeding, and straw erosion control blanket in square meters of actual surface area covering the topsoiled area. .1 Areas of blending into existing turf grass will not be measured for payment.
<u>1.4 SUBMITTALS</u>	.1	Product Data. .1 Submit product data in accordance with Section 01 11 06. .2 Provide product data for: .1 Seed. .2 Fertilizer. .3 Straw Erosion Control Blanket.
<u>1.5 QUALITY ASSURANCE</u>	.1	Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
	.2	Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
	.3	Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements. Comply with Section 01 11 06.
<u>1.6 SCHEDULING</u>	.1	Schedule seeding to coincide with preparation of soil, fertilizing and watering of soil surface.
	.2	Schedule seeding using grass mixtures and mixtures containing Crownvtech and Trefoil or

1.6 SCHEDULING .2 (Cont'd)
(Cont'd)
comparable seed between dates recommended by the
Provincial Agricultural Department.

1.7 WASTE .1 Separate and recycle waste materials in
MANAGEMENT AND accordance with Section 01 11 06.
DISPOSAL .2 Divert unused fertilizer from landfill to
official hazardous material collections site
approved by Departmental Representative.
.3 Do not dispose of unused fertilizer into sewer
systems, lakes, streams, onto ground or in
locations where it will pose health or
environmental hazard.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Seed: "Canada pedigreed grade" in accordance
with Government of Canada Seeds Act and
Regulations.
.1 Grass mixture: "Certified", "Canada No. 1
Lawn Grass Mixture" in accordance with
Government of Canada "Seeds Act" and "Seeds
Regulations".
.2 Mixture composition:
.1 Creeping Red Fescue (Festuca rubra)
55%.
.2 Kentucky Blue Grass (Poa pratensis)
27%.
.3 Perennial Rye Grass (Lolium perenne)
15%.
.4 White Clover (Trifolium repens) 3%.
.3 Apply seed mix at a minimum rate of 200
kg. per hectare.
.2 Water: free of impurities that would inhibit
germination and growth.
.3 Fertilizer:
.1 To Canada "Fertilizers Act" and
"Fertilizers Regulations".
.2 Complete synthetic, slow release with 8%
of nitrogen content in water-insoluble form.
Apply 8-32-16 at a rate of 600 kg/hectare or as
determined by soil analysis.
.4 Erosion Control Straw Blanket: specially
manufactured in rolls for fasten to the ground

- 2.1 MATERIALS
(Cont'd)
- .4 Erosion Control Straw Blanket:(Cont'd)
to cover seeds, is non-toxic, water activated,
with the following properties:
.1 Made from 70% or more straw fiber matrix.
.2 Minimum thickness of 6 mm.
.3 Potential water absorption: minimum 250%.

PART 3 - EXECUTION

- 3.1 WORKMANSHIP
- .1 Seeding to include the following steps:
.1 Prepare the topsoil by working the
fertilizer into the top 30 mm layer of topsoil.
.2 Apply grass seed mixture into the top 10
mm layer of topsoil.
.3 Cover the seeded area with the straw
erosion control blanket, secure it down to the
topsoil surface and water at a rate that does
not cause the erosion of the seed or soil but
that saturates the blanket and the topsoil to a
depth of 100 mm.
.2 Rewater one week later, if necessary, to
maintain sufficient moisture in the topsoil to
promote germination.
.3 Do not perform work under adverse field
conditions such as wind speeds over 10 km/h,
frozen ground or ground covered with snow, ice,
or standing water.
.4 Protect seeded areas from trespass until grass
is established.
- 3.2 PREPARATION OF SURFACES
- .1 Fine grade areas to be seeded free of humps and
hollows. Ensure areas are free of deleterious
and refuse materials.
.2 Cultivated areas identified as requiring
cultivation to depth of 30 mm.
.3 Obtain Departmental Representative approval of
grade and topsoil depth before starting to seed.
- 3.3 FERTILIZING PROGRAM
- .1 Fertilize prior to fine grading and prior to
incorporating fertilizer equally distributed at
a rate of 600 kg per hectare at a ratio of
8-32-16 or as determined by the soil analysis.
-

- 3.3 FERTILIZING PROGRAM
(Cont'd)
- 3.4 ACCEPTANCE
- 3.5 MAINTENANCE DURING WARRANTY PERIOD
- 3.6 CLEANING
- .2 Re-apply where application is not uniform.
 - .1 Seeded areas subject to the Departmental Representatives approval. Contractor to ensure that:
 - .1 Materials of topsoil, fertilizer, seed, and erosion mat are uniformly applied.
 - .2 Seeded areas are free of rutted, eroded, or bare spots.
 - .2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.
 - .1 Perform following operations from time of acceptance until end of warranty period:
 - .1 Repair and reseed dead or bare spots to satisfaction of Departmental Representative.
 - .1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.