SNC·LAVALIN

Bâtisseurs d'avenir

Parks Canada Agency

Lachine Canal – National Historic Site of Canada

Rehabilitation of Spillway 2.

CONSTRUCTION SPECIFICATION

Issued for Tender 100%

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List of Modifications

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Section 00 01 07

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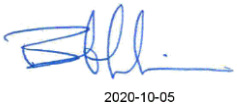

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CL-11-136.2	654138-0200-41DD-0002	C2	General Notes, Legends and Abbreviations
CL-11-136.3	654138-0200-41DD-0003	C3	Steel Demolition (Plan and Sections)
CL-11-136.4	654138-0200-41DD-0004	C4	Concrete Demolition (Plan and Sections)
CL-11-136.5	654138-0200-41DD-0005	C5	Rehabilitation (Plan and Sections)
CL-11-136.6	654138-0200-41DD-0006	C6	Rehabilitation (Details)
CL-11-136.7	654138-0200-41DD-0007	C7	Catwalk (Plan and Sections)
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Reference Drawings List

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GC-920-05-200-07	DÉVERSOIRS
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GC-920-02-200-47	ÉLÉVATIONS ET COUPES DES MURS DE L'ÉCLUSE No 2 SUD
GC-920-02-200-79	PLANS, COUPES, DÉTAILS DÉVERSOIRS OPTION No 1
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END OF SECTION

General Requirements – Summary of Work
Section 01 11 00

PART 1 GENERAL

1.1 DESCRIPTION OF FACILITIES

.1 The Lachine Canal extends over 14.5 kilometers between the Old Port of Montreal and Lake St. Louis. This waterway includes several spillways: spillways 1, 2, Mill, 3 and 4.

.2 The present mandate is for the repair of spillway 2.

.3 Spillway 2 is located in the old south channel. More precisely at the lower entrance of the old Lock 2 in the vicinity of the lower gates. The spillway is a mini-dam containing ten knife gates operated with manual cranks.

1.2 OBJECT

.1 This document defines the works including labor supply, materials and equipment and all works required for the supply and the installation of electrical equipment systems and associated civil work as part of the Lachine Canal Spillway 2 Rehabilitation Project, in accordance with the drawings, the related technical specifications and the associated requirements from Parks Canada.

1.3 RELATED REQUIREMENTS

.1 Section 01 14 00 – Work Restrictions

.2 Section 01 29 00 – Payment Procedures

.3 Section 01 29 83 – Payment – Procedures for Testing Laboratory Services

.4 Section 01 31 19 – Project Meetings

.5 Section 01 32 16.19 – Construction Progress Schedule - Bar Chart (GANTT)

.6 Section 01 33 00 – Submittal Procedures

.7 Section 01 33 00 – Appendix A - Documents Required from the Contractor

.8 Section 01 33 00 – Appendix B - Shop Drawings - Presentation Sheet

.9 Section 01 35 00.06 – Special Procedures - Traffic Control

.10 Section 01 35 29.06 – Health and Safety

.11 Section 01 35 35 – Fire and Safety - DND

.12 Section 01 35 43 – Environmental Protection

.13 Section 01 45 00 – Quality Control

.14 Section 01 52 00 – Construction Facilities

.15 Section 01 56 00 – Temporary Barriers and Enclosures

.16 Section 01 61 00 – Common Product Requirements

.17 Section 01 71 00 – Examination and Preparation

.18 Section 01 72 00 – Project Document

.19 Section 01 73 00 – Execution

.20 Section 01 74 00 – Cleaning

.21 Section 01 74 19 – Construction / Demolition Waste Management and Disposal

.22 Section 01 77 00 – Closeout Procedures

.23 Section 01 78 00 – Closeout Submittals

.24 Section 01 91 13 – General Commissioning Requirements

.25 Section 02 41 16 – Construction Conditions

.26 Section 02 56 13 – Management of Waste

.27 Section 02 83 10 – Lead-Based Paint Abatment – Minimum Precautions

.28 Section 03 10 00 – Concrete Forming and Accessories

.29 Section 03 20 00 – Concrete reinforcement

.30 Section 03 30 00 – Cast in place Concrete

.31 Section 03 60 00 – Compaction grouting

.32 Section 04 03 05.13 – Historic – Mortars

.33 Section 04 03 05.21 – Historic – Masonry Repointing

.34 Section 05 50 00 – Metal Fabrications

.35 Section 06 50 00 – Catwalk

.36 Section 09 91 13.01 – Exterior Re-painting

.37 Section 26 05 00 – Common Work Results for Electrical

.38 Section 26 05 03 – Commissioning

.39 Section 26 05 20 – Wire and Box Connectors (0-1000 V)

.40 Section 26 05 21 – Wires and cables (0-1000 V)

.41 Section 26 05 22 – Connectors and Terminations

.42 Section 26 05 34 – Conduits Fastenings

.43 Section 26 50 00 – Lighting devices

.44 Section 31 05 16 – Aggregate Materials

.45 Section 31 23 33 01 – Excavating, Trenching and Backfilling

.46 Section 31 32 19 01 – Geosynthetics

.47 Section 31 37 00 – Riprap

1.4 CONTRACT TYPE

.1 Work shall be subject to a Lump Sum contract.

1.5 WORK BY OTHERS

.1 Cooperate with other Contractors, if required, in carrying out their respective works and carry out instructions from Departmental Representative.

.2 Coordinate work with that of other Contractors, if required. If any part of work under this Contract depends for its proper execution or result upon work by another Contractor, report promptly to Departmental Representative, in writing, any anomalies or defects which may interfere with proper execution of Work.

1.6 WORK SEQUENCE

.1 Works shall be executed during the closing period of the canal at navigation. This period begins the week following Thanksgiving (October 12th 2021) until May 20th 2022. The water level in the canal is scheduled to be lowered from October 25th, 2021 to May 6th, 2022.

.2 The work at spillway 2 must be completed by April 29th, 2022.

.3 The Lachine Canal will be drained by PCA within two (2) weeks of Thanksgiving Holiday.

1.7 CONTRACTOR'S USE OF PREMISES

.1 The use of the premises is limited to required areas for work, storage and access roads to allow work to be performed by other contractors, if required;

.2 Coordinate use of premises under direction of Departmental Representative.

.3 Obtain and pay for use of additional storage or work areas needed for this Contract.

.4 Remove or alter existing work to prevent damage to portions of existing work which remain.

.5 Repair or replace portions of existing work which have been altered during construction to match existing or adjoining work, as directed by the Departmental Representative.

.6 At completion of construction, the existing works condition shall be equal to or better than that which existed before work.

.7 The available mobilization area for the work is identified in Appendix C.

1.8 OWNER OCCUPANCY

.1 The Owner will use the premises during the entire construction period for normal operation.

.2 Coordinate with the Owner in scheduling activities to minimize conflicts and facilitate operation by Owner.

1.9 EXISTING SERVICES

.1 Notify the Departmental Representative and utility companies of intended interruption of services and obtain required authorizations.

.2 Establish location and extent of existing services located in work area before starting work. Notify the Departmental Representative of any findings.

.3 Submit a schedule and obtain approval from Departmental Representative for any shut-down or temporary closure of services or facilities including power and communication services. Adhere to approved schedule and provide notices to affected parties.

.4 Provide temporary services as directed by Departmental Representative to maintain existing services.

.5 Where unknown services are encountered, immediately notify the Departmental Representative and record findings in writing.

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

.7 Record location of maintained, re-routed and abandoned utility lines.

.8 Install temporary barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

1.10 RIGHTS, PERMITS AND INSPECTION

.1 Pay all required fees.

.2 At the end of the work, obtain from authorities having jurisdiction, an acceptance certificate and forward it to Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 SCOPE OF WORK

.1 General

.1 The work covered by this contract shall include the supply of all materials, labour, tools, equipment, protection and transportation required to complete the work in accordance with the requirements specified on the drawings and in the specification.

.2 The coordination and distribution of work for subcontractors is the Contractor's responsibility and any reference to documents referring to subcontractors shall not be construed as binding the Departmental Representative to such a distribution.

.2 Spillway 2

.1 Civil Work

.1 The civil work covered by this contract shall include but not be limited to:

.1 The dewatering and control of infiltrations of the upstream and downstream work areas

.2 The dismantling and disposal off site, according to applicable laws, of the existing knife gates and the existing catwalk and its support system;

.3 The dismantling, temporary storage and reinstallation of the ladder and the safety boom;

.4 The dismantling, temporary storage, repair if required, painting and reinstallation of the guardrails on the downstream walls of the spillway;

.5 The excavation along the rehabilitated areas, proper off-site disposal as indicated in the drawings and soils characterization;

.6 The demolition of the shotcrete as indicated on the drawings;

.7 The replacement of the geomembrane upstream of the spillway;

.8 The drilling and injection on the right bank as indicated on the drawings;

.9 The repointing of the masonry as indicated on the drawings;

.10 The concrete resurfacing of the vertical face of the adjacent walls as indicated on the drawings;

.11 The backfilling of the excavated sections;

.12 The concreting of the spillway as indicated on the drawings;

.13 The installation of a new catwalk as well as its support system and guard-rails as indicated on the drawings;

.14 The sandblasting and painting of the existing stoplog gains and embedded steel parts on the upstream face of the spillway;

.15 The supply and installation of a concrete protection slab and a riprap section downstream of the spillway;

.16 Necessary protection of the work area and temporary support of existing structures.

.2 Electrical Work

.1 The work covered by this contract shall include but not be limited to:

.1 The dismantling of the existing lighting fixtures under the catwalk;

.2 The supply, installation, hookup and commissioning of new LED lighting fixtures along the guard-rail;

.3 The supply and installation of all electric conductors and cables and their accessories.

.2 Note regarding the electrical hook-up:

.1 The electrical supply of the catwalk lighting is done from pulling pit PA-1 shown on the drawing. All work beyond this point is not part of this mandate.

END OF SECTION

General Requirements – Work Restrictions
Section 01 14 00

PART 1 GENERAL

1.1 CONSTRUCTION CONSTRAINTS

.1 Several constraints will affect the realization of work.

.2 Work shall consider:

.1 Access availability according to weather conditions;

.2 Spaces availability for sites facilities;

.3 Environmental restrictions;

.4 Security constraints.

1.2 ARCHEOLOGY

.1 Specific conditions

.1 Lachine Canal National Historic Site of Canada is known by Canadian Government as one of the sites with highest heritage value. Thus, on this property, any soil excavation work recognized as possibly containing archaeological remains must be monitored by an archaeologist designated by the federal government.

.2 Archeological requirements are presented in this section due to the potential of discovering archaeological remains during excavation work required in the project.

.2 Access and collaboration

.1 Contractor shall cooperate and comply with all Project Authority instructions during excavation work to avoid any loss of archaeological information on the site, if applicable.

.2 Contractor shall facilitate access to Work and collaborate with the archaeologist. Archaeologist or his representative will be on site, according to the needs related to the protection and the recording of the remains. Their role will be to guide Contractor to avoid any loss of archaeological information and gather information about the remains.

.3 Contractor must allow the archeology team to carry out the archaeological examinations and surveys if required.

.3 Archeological discoveries

.1 Contractor shall notify Parks Canada representative or, in his absence, the archaeologist or his representative of any archaeological discovery (remnant of construction or development, object and fragment of object) carried out on Site and wait for instructions before continuing work on the place of discovery.

.2 Remains, antiques and other items with historical, archaeological or scientific interest (vestige, object or fragment of object) found on Site or in the areas to be excavated or demolished remain property of the Crown. The contractor will need to protect them and obtain direction from the Project Authority in this regard.

.4 Work Stoppage

.1 Contractor must provide in its contract, at its expense, work stoppages of 15 minutes per half-day of excavation in areas requiring the presence of the archaeologist (as described in section 1.2.1 of this section). These stops, if not used, will be accumulated and can be reused as needed later. A record of unused time will be kept by the Departmental representative in consultation with Contractor and Archaeologist.

.2 For a work stoppage of more than 30 minutes, the Departmental representative shall evaluate the implications of this judgment and will notify the contractor accordingly. Contractor may be required to assign the machinery to another work area to allow archaeologist work. If relocation is not possible, the contractor will be compensated according to the agreement set out at the kick-off meeting.

.3 In case of accidental discoveries of cultural resources made in the absence of an archaeologist, contractor must suspend work in the immediate area of the discovery and notify Parks Canada Agency.

.5 Manual excavations for archeological purposes

.1 Given the possibility of archaeological discoveries, Contractor is advised that during the works, manual excavation may be required as well as any work necessary to ensure the protection of discoveries. The contractor will be compensated according to the agreement set out at the kick-off meeting.

.6 Protection of remains and works

.1 Contractor shall take all reasonable precautions during excavations and work to protect the remains and to allow for their examination by archaeologists. Parks Canada will not tolerate any derogation in this regard. If Contractor negligently deteriorate any vestige, it will be held responsible and the Ministry will consider the consequences.

.2 If the Parks Canada representative authorizes the demolition of archaeological items on the site, Contractor must take necessary precautions to ensure the protection of adjacent archaeological works that will not be demolished. These demolitions must be carried out gradually and in a controlled way after the archaeological surveys have been completed. If any work is damaged during work, notify Parks Canada representative immediately.

1.3 CONTRACTOR SITE ACCESS

.1 If Contractor causes damage to roads and installations, Contractor is responsible to repair or replace at his own cost to the complete satisfaction of Parks Canada Agency.

1.4 SITE CLEANING AND MAINTENANCE AND ENVIRONMENT PROTECTION

.1 Keep the site clear of all material accumulations, scrap and waste and make a complete and final cleaning to the satisfaction of Parks Canada Agency.

.2 Contractor is responsible to dispose waste and debris in appropriate places.

1.5 WINTER CONDITIONS

.1 Snow removal of the site is the responsibility of the Contractor. Contractor is also responsible for all its accesses off the existing roads.

1.6 WEEKEND WORK

.1 If the Contractor plan any work on Saturdays, Sundays, statutory holidays or nights, he shall give a written notice to Parks Canada Agency at least five (5) business days before the work. The Contractor must respect municipal regulations.

1.7 WORK BY OTHERS

.1 Cooperate with other Contractors.

1.8 SITE INSPECTION

.1 Starting the work completely or partially means that the Contractor accepts the existing conditions of the site. If the Contractor performs its work on defective surfaces or conditions, corrections or rework will be made at his own cost.

1.9 DYNAMITING

.1 No blasting work of any kind is allowed.

1.10 ENVIRONMENTAL RESTRICTIONS

.1 Environmental restrictions are defined in section 01 35 43 – Environmental Procedures.

.2 Work shall meet federal, provincial and local noise requirements.

1.11 LAND-SURVEYING

.1 Contractor responsible to characterize the various structures according to Departmental Representative drawings and do a survey of the existing all around to validate the connection to the existing. Contractor shall notify to the Departmental Representative and to Parks Canada Agency any unforeseen of anomaly detected. Contractor shall plan the time required for a possible verification by the Departmental Representative.

.2 Before the final acceptance of the work, Contractor shall provide survey plans of the final work (Final Drawings) on a computer media.

1.12 WORK SCHEDULE

.1 Construction work is allowed between 7h00 and 19h00, Monday to Friday.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION OF THE ITEMS ON THE PRICE SCHEDULE

.1 General Conditions

.1 Item 1.1 – Site Organization

.1 Payment of this item shall me made as follows:

.1 25% with the first monthly payment, after mobilization and installation of site facilities;

.2 50% also distributed with milestone payments and in proportion to the progress of the work;

.3 25% with payment issued upon issuance of "Substantial Completion Certificate" after final cleaning.

.2 This item is paid on a lump sum basis and includes the costs of mobilization and demobilization, the cost of purchasing, depreciating or leasing machinery, tools and equipment, personnel, materials, site facilities and any mobilization as may be required to meet the work schedule.

.3 Maintenance and operating costs for the maintenance of machinery, equipment and tools included in the worksite facilities during the work and the personnel supporting these facilities are also included.

.4 This price includes, but is not limited to:

.1 Land

.1 Expenses for the acquisition, lease, compensation and use of land other than those made available to the contractor, either for the site installations or for temporary laydown areas.

.2 The costs of use and maintenance of the lands made available to the contractor.

.2 Layout of the site work zones

.1 Land layout required for set-up of site facilities

.2 Site drainage.

.3 Site office of the personnel.

.4 Premises for storage of equipment.

.5 External storage for material and equipment.

.6 Barriers and fencing required throughout the duration of the work, including its eventual movement and all temporary safety devices

.3 Access roads

.1 Any additional access roads required.

.2 Maintenance of access roads (cleaning in summer, leveling of gravel roads, installation of dust suppressant, etc.).

.3 Temporary signage.

.4 Required temporary road diversions.

.5 Snow removal during winter, if required.

.4 Materials and supply

.1 Generators and temporary lighting;

.2 Scaffolding;

.3 Small tools;

.4 Compressors;

.5 Other required equipment;

.5 Temporary works and cofferdams

.1 The supply and installation of cofferdams identified or not on the drawings but required for the works.

.2 Required actions and supplies such as, but not limited to, labor, equipment, tools and machinery, materials, professional services and land surveys for transportation and land surveys for temporary support of utilities.

.3 Engineering and expertise as well as the design of structures and the provision of drawings signed and sealed by an engineer who must be a member of the “Ordre des Ingénieurs du Québec” (OIQ) as well as technical data sheets (materials, equipment, etc.) to the Departmental Representative for approval.

.4 Restoration of the site upon completion of work.

.6 Networks

.1 Toilets on site;

.2 Water supply to existing site facilities;

.3 Fire protection;

.4 Water for compaction of material and dust suppressant.

.5 Power supply;

.7 Health and Safety

.1 All equipment, labour, materials, machinery, tooling and accessories required to ensure health and safety in accordance with Section 01 35 29.06 of the construction Specification and applicable laws and regulations.

.8 Environment

.1 The protection of the environment, in accordance with section "01 35 43 - Environmental Protection" of the construction specifications and applicable laws.

.2 Construction / demolition waste management, in accordance with the requirements of all sections of "Division 1 - General Requirements" of the Construction Specification excluding contaminated material.

.9 Miscellaneous

.1 Transportation of contractor's personnel;

.2 Disposal of waste.

.3 All loading and unloading activities required by the contractor.

.4 Coordination with users and other contractors in same areas.

.5 Coordination of sub-contractors and suppliers;

.6 Site coordination meetings.

.7 Performance tests and commissioning;

.8 All other costs required for the complete execution of the works but not included in other unit or lump sum costs;

.2 Soil Characterization

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, collection of samples at site and laboratory analyses for soil characterization.

.2 The samples will be collected in the anticipated excavation zones.

.3 At a minimum, one (1) sample per excavated area (one (1) upstream and one (1) downstream of the spillway.

.4 The following analyses are to be carried out on the samples:

- Petroleum Hydrocarbons (C10-C50) (Laboratory Method: STL SOP-00172);
- Mercury by ICP-MS (Laboratory Method: STL SOP-00069);
- Total Extractable Metals by ICP (Laboratory Method: STL SOP-00069);
- Polycyclic Aromatic Hydrocarbons (Laboratory Method: STL SOP-00178).

.5 All costs necessary to complete this item must be included.

.6 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.2 Spillway 2

.1 Item 2.1 – Dewatering and control of infiltrations of the Canal floor

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms, the

management of sediments in the pumped water, for the dewatering and control of infiltrations of the Canal floor, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.2 Item 2.2 – Cleaning and disposal off-site of debris upstream of the spillway

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the cleaning and disposal off-site of the debris upstream of the spillway, all in accordance with the drawings and requirements of the specifications.

.2 The disposal off-site of the debris.

.3 All costs necessary to complete this item must be included.

.4 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.3 Item 2.3 – Removal and temporary storage of existing equipment (ladder and safety boom)

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the removal and temporary storage of existing equipment (ladder and safety boom), all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.4 Item 2.4 – Removal, repair (if required), painting and temporary storage of the guard-rails on the walls downstream of the spillway

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the removal, repair (if required), painting and temporary storage of the guard-rails on the walls downstream of the spillway, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary for the handling of lead based contaminated debris. There is lead present in the painted items.

.3 All costs necessary to complete this item must be included.

.4 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.5 Item 2.5 – Dismantling and disposal of the existing knife gates, catwalk including its support system and guard-rails and steel plates

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the dismantling and disposal of the existing knife gates, catwalk including its support system and guard-rails and steel plates, all in accordance with the drawings and requirements of the specifications.

.2 The off-site disposal of waste, according to applicable laws. There is lead present in the painted items.

.3 All costs necessary to complete this item must be included.

.4 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.6 Item 2.6 – Dismantling and disposal of the existing cabling and electrical equipment (lighting fixtures)

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the dismantling and disposal of the existing cabling and electrical equipment (lighting fixtures), all in accordance with the drawings and requirements of the specifications.

.2 The off-site disposal of waste.

.3 All costs necessary to complete this item must be included.

.4 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.7 Item 2.7 – Excavation, transport and disposal or temporary stockpiling (if required)

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the Excavation, transport and disposal or temporary stockpiling (if required), all in accordance with the drawings and requirements of the specifications.

.2 Stockpiling and off-site disposal.

.3 Management plan for contaminated soils (if required).

.4 Surcharge for off-site disposal and elimination of contaminated soil (if required).

.5 All costs necessary to complete this item must be included.

.6 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.8 Item 2.8 – Protection of the embedded steel stoplog gains and the existing embedded steel parts

.1 These items remunerate on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials,

surveys, permits, professional services, construction engineering and work platforms for the protection of the embedded steel stoplog gains and the existing embedded steel parts, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete these items must be included.

.3 The payment of these items will be made according to the progress of the work, as approved by the Departmental Representative.

.9 Item 2.9 – Protection of the existing masonry wall

.1 These items remunerate on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the protection of the existing masonry wall, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete these items must be included.

.3 The payment of these items will be made according to the progress of the work, as approved by the Departmental Representative.

.10 Item 2.10 – Shotcrete demolition including the removal of steel plates/edgings

.1 These items remunerate on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the shotcrete demolition including the removal of steel plates/edgings, all in accordance with the drawings and requirements of the specifications.

.2 The off-site disposal of waste.

.3 All costs necessary to complete these items must be included.

.4 The payment of these items will be made according to the progress of the work, as approved by the Departmental Representative.

.11 Item 2.11 – Injection drilling including casings

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the injection drilling including casings, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.12 Item 2.12 – Grout Injection

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the grout injection, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.13 Item 2.13 – Repointing of the masonry walls

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the repointing of the masonry walls, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.14 Items 2.14, 2.15 and 2.16 New concrete for the walls including surface preparation. dowels, reinforcing steel, formwork and concrete finishing pattern to match existing masonry, new concrete on existing wall including surface preparation. dowels, reinforcing steel and formwork and the new protection slab downstream of the sill including reinforcing steel and formwork

.1 These items remunerate on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the new concrete for the walls including surface preparation. dowels, reinforcing steel, formwork and concrete finishing pattern to match existing masonry, new concrete on existing wall including surface preparation. dowels, reinforcing steel, formwork and the new protection slab downstream of the sill including reinforcing steel and formwork, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete and provide this item, such as concrete, surface preparation, concrete insert accessories, anchors and formwork where applicable, pumping, vibration, finishing, ripening, saw cuts, joints, chamfers, tests and coordination for the placement of anchors, sleeves or any other element or accessory to be embedded in the concrete shall be included.

.3 The price shall also include all costs necessary for the completion of the survey, prior to the commencement of the work, to determine the profile and geometry of any element present in the right-of-way of the work as specified in the plans and specifications. The price must also include all costs necessary for the completion and revisions of the shop drawings, before the start of the work, as specified in the drawings and specifications.

.4 The price also includes substrate preparation as specified in plans and specifications.

.5 The price also includes all costs associated with concreting in cold weather.

.6 All costs necessary to complete these items must be included.

.7 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.15 Item 2.17 – Sandblasting and painting of the embedded steel stoplog gains and the existing embedded steel parts downstream of the sill

.1 These items remunerate on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the protection of the embedded steel stoplog gains and the existing embedded steel parts downstream of the sill, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary for the off-site disposal of waste contaminated with lead. There is presence of lead in the paint.

.3 All costs necessary to complete these items must be included.

.4 The payment of these items will be made according to the progress of the work, as approved by the Departmental Representative.

.16 Items 2.18 and 2.19 – Backfilling of the upstream area including new geomembrane, geotextile, riprap and sand and gravel and backfilling of the downstream area including new geotextile, riprap and MG-20

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the backfilling of the upstream area including new geomembrane, geotextile, riprap and sand and gravel and backfilling of the downstream area including new geotextile, riprap and MG-20, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.17 Item 2.20 – New catwalk, guard-rails and its support system including anchors

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the New catwalk, guard-rails and its support system including anchors, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.18 Item 2.21 – Supply and installation of the new electrical equipment and cables

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the supply and installation of the new electrical equipment and cables, all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

.19 Item 2.22 – Re-installation of existing equipment (ladder, safety boom and guard-rails on the downstream walls)

.1 This item remunerates on a lump sum basis (LS) all necessary measures, actions and supplies such as, but not limited to, management, labor, tools and machinery, equipment, materials, surveys, permits, professional services, construction engineering and work platforms for the Re-installation of existing equipment (ladder, safety boom and guard-rails on the downstream walls), all in accordance with the drawings and requirements of the specifications.

.2 All costs necessary to complete this item must be included.

.3 The payment of this item will be made according to the progress of the work, as approved by the Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Inspection and testing to be carried out by Contractor.

1.2 APPOINTMENT AND PAYMENT

.1 Contractor will provide independent laboratory services to perform the tests as described in this technical specification. The costs of the laboratory services are the responsibility of the Contractor.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Provide labour, equipment and facilities to:

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and testing.

.3 Repair disturbed structures during inspections and tests.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Where materials are specified to be tested, deliver representative sample in required quantity to testing laboratory.

.3 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Project Meetings
Section 01 31 19

PART 1 GENERAL

1.1 ADMINISTRATIVE

.1 Schedule project meetings throughout the project at the call of Departmental Representative who will manage them. Meetings will be held at intervals or two (2) weeks or less as required by Representative of the Ministry. The meetings will take place in Contractor's trailers.

.2 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act, if required, on behalf of each represented party.

1.2 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, request a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 Departmental Representative, Contractor and any other party required by Departmental Representative 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 Designation of official representatives of the participants in the Work.

.2 Schedule of Work: in accordance with Section 01 32 16.19 – Construction Progress Schedules - Bar Chart (GANTT).

.3 Schedule of submission of shop drawings, samples, and colour samples. Submittals in accordance with Section 01 33 00 – Submittal procedures.

.4 Requirements for temporary facilities, site signage, offices, storage shed, utilities, fences in accordance with section 01 52 00 – Construction Facilities.

.5 Site security in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

.6 Proposed changes, change orders, procedures, approvals, mark-up percentages permitted, delays, overtime and others administrative requirements.

.7 Record drawings in accordance with Section 01 33 00 – Submittal Procedures.

.8 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 – Closeout Submittals.

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

.10 Appointment of inspection and testing agencies or firms.

.11 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 Meetings will be held every two (2) weeks or more as needed, as required by Departmental Representative.

.2 Agenda to include the following

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Fields observations, problems and conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision of construction schedule.

.8 Revision of progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

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

.12 Other.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements
Construction Progress Schedule – Bar Chart (GANTT)
Section 01 32 16.19

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 (GRANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or another 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 The Contractor will be responsible for the preparation of the execution calendar and of its periodic update.

.2 The execution calendar must correspond to the dates indicated in section 1.6.

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

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

.5 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.

.6 Ensure that it is understood that Award of Contract or beginning time, rate of progress, Interim Certificate and Final Certificates of completion constitute defined project milestones and are essential requirements of the Contract.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Maximum ten (10) working days after contract award, provide to Departmental Representative a Bar Chart (GANTT Chart) that would serve as master plan and will be used for planning and monitoring Work and for progress reports.

1.4 PROJECT MILESTONES

.1 Project milestones from interim targets for Project Schedule.

.1 Project granting;

.2 Start of Work (mobilization);

.3 End of Work and provisional acceptance;

.4 Final acceptance.

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:

.1 Contract Award.

.2 Shop Drawings, Samples.

.3 Permits.

.4 Mobilization.

.5 Excavation.

.6 Backfill.

.7 Supplied equipment long delivery items.

1.7 PROJECT SCHEDULE REPORTING

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

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

1.8 PROJECT MEETINGS

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

.2 Weather related delays with their remedial measures 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.

END OF SECTION

PART 1 GENERAL

1.1 ADMINISTRATIVE

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

.2 Do not proceed with Work where submittals are required until review is complete.

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

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

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

.6 Verify field measurements related to adjacent structures affected by Work.

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

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

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

.10 Submitted document shall include a transmittal letter containing:

.1 Date;

.2 Project number and title;

.3 Contractor’s name and address;

.4 Title and quantity of each submitted document;

.5 Any other pertinent data.

.11 Submit required data sheets compliant with the Workplace Hazardous Materials Information System (WHMIS).

1.2 DOCUMENTS REQUIRED FROM CONTRACTOR

.1 Documents to be submitted are defined but not limited to in Appendix A.

1.3 CERTIFICATES AND TRANSCRIPTS

.1 Submit to Departmental Representative documents required by authorities having jurisdiction for the protection of workers in the case of a work accident immediately after contract award.

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Quality: Shop drawings will be provided by Email as an original electronic PDF format. No shop drawing will be accepted as a fax for clarity purpose.

.3 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada

.4 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where structures or equipment attach or connect to other structure or equipment, indicate that such items have been coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Accompany submissions with transmittal letter, (Appendix B), containing:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of Contractor, Subcontractor, Supplier and Manufacturer

.4 Identification and quantity of each shop drawing, product data and sample.

.5 Other pertinent data.

.7 Contractor is responsible for the reproduction of the «Shop Drawings Presentation Sheet » and shop drawings in enough quantities for all subcontractors and suppliers, an additional copy for the Departmental Representative and copies for operation and maintenance books.

.8 No shop drawing will be verified if not submit in accordance with described procedure.

.9 Before submitting shop drawings to Departmental Representative, Contractor shall:

.1 Number each page;

.2 Point out all equipment and/or accessories include in shop drawings;

.3 Verify shop drawings are in accordance with plans and specifications for quality, specifications and space requirements.

.10 Departmental Representative will have ten (10) business days for the verification of shop drawings from the day of receipt.

.11 Verification of shop drawings by the Departmental Representative is an intermediate step of quality control and can not constitute an order of change to the Contract Documents.

.1 Departmental Representative will verify the drawings submitted by the Contractor in accordance with the general layout of the equipment. Examination of this document does not relieve the Contractor or the supplier of their responsibility for the accuracy of this document or its conformity with the contractual documents and the site conditions in any way. Annotations made by the Departmental Representative on the drawings are not exhaustive.

.12 Annotations on the Departmental Representative verification stamp are:

.1 « FINAL » means Contractor may proceed as per its drawing, no modification is required;

.2 « FOR INFORMATION ONLY » means document is for informational purpose only;

.3 « SUITABLE, START FABRICATION, RESUBMIT CERTIFIED REPRODUCIBLE » means Contractor may proceed as per its drawings by incorporating annotations added by Departmental Representative, resubmit document in accordance with the execution;

.4 « MODIFY AS NOTED, COMMENCE FABRICATION AND RESUBMIT » means Contractor may proceed as per its drawing if modified as per Departmental Representative comments, resubmit drawing in accordance with comments added by Departmental Representative;

.5 « MODIFY AS NOTED, RESUBMIT BEFORE FABRICATION » means information contained in the drawing or the drawing itself is incomplete, illegible, etc., and this information does not allow Departmental Representative to make a judgment on compliance with drawings and specifications. In such case, Departmental Representative may indicate the points to be specified or completed by Contractor before resubmitting;

.6 « NOT SUITABLE, RESUBMIT BEFORE FABRICATION » means drawings concern materials or works not conform to drawings and specifications. In such case, Contractor shall submit another drawing to Departmental Representative.

.13 Make changes requested by Departmental Representative to shop drawings in accordance with Contract Documents requirements. When resubmitting, notice Departmental Representative in writing of changes made in addition of those required.

.14 Submit electronic one (1) copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture.

.15 Keep one (1) annotated copy of Appendix B « Shop Drawings – Presentation Sheet » and shop drawing on site and ensure its availability for future reference use.

.16 Submit (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within three (3) years of date of contract award for project.

.17 Submit (1) electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.

.2 Certificates must be dated after award of project contract complete with project name.

.18 Submit (1) electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.

.19 Submit (1) electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.20 Submit documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.21 Submit (1) electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.

.22 Delete information not applicable to project.

.23 Supplement standard information to provide details applicable to project.

.24 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned, and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.

.25 The review of shop drawings by the Departmental Representative is for sole purpose of ascertaining conformance with general concept.

.1 This review shall not mean that Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.

.2 Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

.26 Upon receipt of the Parks Canada Agency intent letter, Contractor selected will have thirty (30) business days to provide all shop drawings for approval.

1.5 SAMPLES

.1 Contractor submits standard samples of manufacturers that Departmental Representative can require for the approval by Departmental Representative. Samples shall have a label indicating their origin and the purpose for which they are intended for the work and conform to the requirements of the contract documents.

.2 Contractor provides specified samples of complex and dimensioned products as well as stamped concrete.

.3 No order, purchase or products/materials production shall take place before written approval of the samples required in the specifications has been received.

.4 Products and works are similar to approved samples.

1.6 MIXTURES' DOSING AND TESTING

.1 Provide results of the mixtures' tests and dosage requested by Departmental Representative.

.2 No concrete pouring of paving will be authorized before proving the perfect conformity of the materials.

1.7 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic and hard copy of colour digital photography, fine resolution monthly with progress statement as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

1.8 FINAL DRAWINGS

.1 Documents to keep on Site:

.1 Provide one (1) set of drawings and indicate all changes made during the work.

.2 Report information every week noted on the copy of the reproducible drawings so that they show as it is actually installed.

.3 Use Parks Canada Agency specifications for drawings.

.4 Keep these drawings on site and make available for reference and verification.

.2 Final Drawings

.1 Before starting testing, system balances and adjustments, complete as-built drawings.

.2 Identify each drawing in the lower right corner, with letter at least 12 mm high, as follow: FINAL DRAWINGS: THIS DRAWING HAS BEEN REVISED AND INDICATES THE WORK AS BUILT [(Contractor signature) (Date)].

.3 Submit drawings for approval to Departmental Representative and make required corrections.

.4 Submit reproducible copies, complete as-built drawings with Operation and Maintenance Manual.

.5 Submit one copy of each as-built drawing and add to final testing, balancing and adjustment report.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Documents and Samples to Submit
Section 01 33 00
Appendix A – Documents Required From The Contractor

PART 1 DOCUMENTS REQUIRED AT THE BEGINING OF THE WORK

.1 These requirements must be completed before the mobilization:

- .1 Performance bond;
- .2 Bonding for liabilities, equipment and services;
- .3 Insurance certificate;
- .4 List of subcontractors and their contact information;
- .5 List of suppliers with addresses and contact information;
- .6 List of machinery to be used;
- .7 List of hourly rates for labour and machinery;
- .8 List of workers assigned to the project and their contact information;
- .9 Work schedule;
- .10 Health and Safety Plan;
- .11 Notice of opening of a construction site to CNESST;
- .12 RBQ valid license for each subcontractor;
- .13 Localization copy from Info-Excavation for public utilities;
- .14 Health and safety prevention program;
- .15 Contractor's Temporary Facilities Plan;
- .16 Traffic plan;
- .17 List of emergency contact with phone number (traffic, environment, accidents, etc.);
- .18 Identify an emergency contact available 24 hours a day and 7 days a week;
- .19 A copy of rights of way agreement for private areas (if required);
- .20 Environment protection plan (see template in appendix);

PART 2 DOCUMENTS REQUIRED DURING THE WORK UNTIL PROVISIONAL ACCEPTANCE

.1 These requirements must be completed before the provisional acceptance (essential prerequisite) to obtain the provisional approval with deductions:

- .1 Shop Drawings list;
- .2 Shop Drawings;
- .3 Test reports;
- .4 Manufacturers’ instructions;

.5 Tests and factory inspection reports;

.6 Test and in situ verification plan;

.7 Start-up and commissioning plan;

.8 Operation manual;

.9 Suppliers manual;

.10 List of final drawings;

.11 Final drawings

.12 Employee training plan;

.13 Contractor's Health and Safety Plan including those of its sub-contractors;

.14 Spare parts list

.15 Mixing formulas and data sheets required for concrete, bituminous concrete and bitumen;

.16 Compliance certificates of materials;

.17 Products data sheets;

.18 Drawings of temporary work describing the recommended method for the construction/repairs of a permanent work;

.19 Welding procedures

PART 3 DOCUMENTS REQUIRED FOR FINAL ACCEPTANCE

.1 These requirements must be completed for the final acceptance:

.1 List of deficiencies fully completed and signed by the Departmental Representative.

.2 Marked-up drawings as observed in order to prepare the as built drawings.

END OF SECTION

General Requirements – Submittal Procedures
Section 01 33 00
Appendix B – Shop Drawings – Presentation Sheet

CONTRACTOR:	
Supervisor:	
Phone: ( )	Email:

SUBCONTRACTOR: Address:	
Supervisor:	
Phone: ( )	Email:

SPECIALITY (discipline):	
Shop Drawing n°:	**Number of pages:**
Delivery Time (after verification):	
SHOP DRAWING DESCRIPTION:	
Drawing Reference:	
Technical Specification's Reference : Section : Article : Page :	

SUPPLIER: Address:	
Supervisor :	
Phone: ( )	Fax: ( )
SUBMITTED PRODUCT :	**DRAWING ISSUED FOR:**

☐ As built	☐ Verification
☐ Equivalent	☐ Information
☐ Substitution	☐ Coordination
	☐ Other:

REVISION	**DATE**

NOTES:

COMPLIANCE VERIFICATION

Nature and scope of the audit

☐ Compliance with drawings and specifications
☐ Other:

This audit does not constitute in any way a detailed and complete verification of the design.

☐ Approved
☐ Correct as indicated
☐ Correct and Re-submit
☐ Refused

Signature ☐ Engineer ☐ Other _____ Date _____

Name _____ OIQ No. _____

Verification of this document is restricted to the nature and extent indicated. It does not relieve in any way the person or company that prepared it from its obligations.

General Requirements – Special Procedures – Traffic Control
Section 01 35 00.06

PART 1 GENERAL

1.1 TRAFFIC PROTECTION

.1 Comply with existing laws, rules and orders governing the traffic and the use of roads where work or material transportation is required.

.2 Build and maintain an access road to Site and to any other area indicated except if another access road authorized by Departmental Representative is available.

1.2 INFORMATION AND WARNING DEVICE

.1 Provide and install delineators, barricades and other warning device in accordance with the Work Area Traffic Control Manual.

.2 Install signs and other devices at locations recommended in the Work Area Traffic Control Manual.

.3 Before the start of Work, consult with the Departmental Representative to make a list of the signs and other devices required for the Work. If the Site situation changes, review the list to the satisfaction of the Departmental Representative.

.4 Maintain signalling devices as follow:

.1 Check signs every day to ensure they are readable, in good condition, at the right place and meets requirements. If required, clean, fix or replace signs to keep the clarity and reflectance.

.2 Remove or cover signs that don’t apply to existing situations as they may vary day by day.

1.3 TRAFFIC CONTROL

.1 Provide a signalman whose training and equipment are in accordance with the Work Area Traffic Control Manual for the following situations:

.1 When public traffic must bypass vehicles or equipment blocking the roadway wholly or partly.

.2 When temporary protection measures are required for installation or removal of signalling devices.

.3 When emergency protection measures are required due to the impossibility to obtain signalling devices quickly.

.4 In any case where other signalling devices do not provide a total protection to workers, equipment or public traffic.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 CONTENT

.1 Contractor shall manage its activities so that the health and safety of the public and of the site workers and the environmental protection always take precedence over cost and schedule issues.

1.2 REFERENCE STANDARDS

.1 Latest available revision of the following documents shall be used:

.1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations

.2 Canadian Standards Association (CSA)

.3 An Act Respecting Occupational Health and Safety, R.S.Q., c.S-2.1. (2002)

.4 Safety Code for the Construction Industry, S-2.1, r.6 (2001)

.5 Any other law or rule for health and safety that would be applicable depending on the company status or the context of the Work.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit to Departmental Representative a site-specific construction prevention plan in accordance with article 1.9 - Health and Safety Management of this Section at least ten (10) days before starting the work. Contractor shall update its prevention plan if the work differs from projections. Departmental Representative may, after receiving the plan or at any time during the work, require that the plan be amended or supplemented to better reflect the Site reality. Contractor shall then make the necessary corrections to the plan before the work begins.

.3 Submit to Departmental Representative a Site inspection chart completed to the frequency indicated at article 1.13 – Site Inspection and Dangerous Situations Corrections of this Section.

.4 Submit to Departmental Representative within 24 hours, a copy of any inspection report, correction or recommendation notice issued by federal or provincial inspectors.

.5 Submit to Departmental Representative within 24 hours, an investigation report for any accident involving injury and any incident highlighting potential risk.

.6 Submit to Departmental Representative identification sheets of all controlled products used on site at least three (3) days before using the products.

.7 Submit to Departmental Representative all training certificate required to meet the requirement of the Prevention Plan, in particular:

.1 Workplace and Corporate First Aid Courses and Cardiopulmonary resuscitation;

.2 Confined space work;

.3 Lockout procedures;

.4 Wearing and adjustment of personal protective equipment;

.5 And any other training required by law or prevention plan.

.8 Medical Examinations: when medical examinations are required by law, rule or to meet the prevention plan, Contractor shall:

.1 Submit to Departmental Representative the medical examination certificate for its supervisory staff and employees who will be present at the beginning of the work;

.2 Then, submit as soon as possible, medical examination certificate for any newcomer to the site.

.9 Emergency Plan: emergency plan shall be submitted to Departmental Representative with the prevention plan as specified in article 1.9 – Health and Safety Management.

.10 Work Permit: Contractor shall obtain all municipal, provincial and federal permits required in accordance with the Contract requirements. A copy of the permit application shall be sent to Departmental Representative without delay.

.11 Plans and Statements of Conformity: Submit to Departmental Representative a signed and sealed by an engineer, working methods, drawings and statements of conformity for the following situation:

.1 Any modification to an equipment or machinery part that has not been authorized in writing by the supplier. A copy of these documents shall always be available at site.

1.4 SAFETY ASSESSMENT

.1 Identify all dangers related to any stages of the Work.

.2 Plan and organize the work to reduce on-site health hazards or collective protection and so, mitigate the need for personal protective equipment. When personal fall protection is required, workers shall use a safety harness in accordance with CSA-Z-259.10-M90. A safety belt shall not be use as personal fall protection.

.3 Any equipment, tool or protective means that cannot be installed or uses without compromising health and safety of workers and public is inappropriate for the work to be performed.

.4 Any mechanical equipment shall be inspected before being on Site. Before using mechanical equipment, Contractor shall submit to Departmental Representative a conformity statement signed by a competent mechanic. At any time, the Departmental Representative can order to stop the equipment and required a second inspection performed by the specialist of its choice if he suspects a defaults or safety hazard.

1.5 MEETINGS

.1 A decision-making representative of the Contractor shall attend all meetings when health and safety is discussed on site.

.2 Not used.

1.6 REGULATORY REQUIREMENTS

.1 Comply with laws, rules and standards related to Work.

.2 Especially, Contractor shall include all measures related to marine environment work (rescue boats, life jackets, buoys, poles, etc.) in its working plan.

1.7 PROJECT/SITE CONDITIONS

.1 On Site, Contractor shall consider the following particular conditions:

.1 Risk related to transshipment, handling and boarding of floating equipment as well as manual work near operating hydraulic or cable-operated excavator during dredging.

.2 Risk related to potential offshore oil spillage and its containing operation.

.3 Risk of drowning

.1 For all work involving drowning risks, respect the following requirements:

.1 Comply with article 2.10.13 of the Safety Code for the construction industry.

.2 (a) Wear lifejacket or floating device in accordance with the following standard:

- Standard CAN/CGSB-65.7-M88 from the Canadian General Standards Board (CGSB) titled Life Jackets, inherently buoyant, standard type.
- Or for some exceptions, be accepted by Transport Canada

(b) Or be protected by a safety net of any fall protection device.

.3 Obtain and submit to Departmental Representative a compliance letter provided by Transport Canada for the approval of any boat (transport, rescue, inspection or other) before starting the work.

.4 Make sure that a lifeboat moored and in the water is available for each work station. If a lifeboat is accessible by land, it may serve several work stations provided that distance between each workstation and the boat is less than 100m.

.5 Make sure that the boat has the required characteristics to accommodate people that may participate in the rescue operation.

.6 Make sure that the lifeboat is always available for workers in an emergency.

.7 Make sure that a qualified person is available to operate emergency equipment. This person shall have its Pleasure Craft Operator Card according to the length of the boat used.

.8 Establish written emergency procedure in which there is the following information and make sure that all workers concerned by these procedures have received appropriate training and information to apply them:

- Procedures descriptions including the responsibilities of these allowed on Site;
- Location of the emergency equipment.

.9 When the workstation is a pier, pond, wharf or any other similar structure, a ladder with at least two steps below water level shall be installed on the front of the structure, every 60m. This applies even for a construction project. In this situation, a temporary (or portable) ladder can be used and removed at the end of the work if the owner does not have the basic facilities.

1.8 HEALTH AND SAFETY MANAGEMENT

.1 Accept and assume all duties and responsibilities assigned to the project owner and employer under applicable health and safety laws and rules.

.2 Develop a site-specific prevention plan based on risk identification and implement this program from the beginning to the final stage of demobilization of the work. The prevention plan shall consider all information given in article 1.8- Project/Site Conditions. This plan shall be given to all concerned people in accordance with Article 1.4-Submittal Procedures. This prevention plan shall include, at least:

.1 Company's health and safety policy;

.2 Work description schedule an expected staffing curve;

.3 Organization chart of health and safety responsibilities;

.4 Physical and material disposition plan of the Site;

.5 First Aid standards;

.6 Risk identification related to Site;

.7 Risk identification related to tasks performed, including preventives measures and implementation methods;

.8 Training required;

.9 Accident/injury procedure;

.10 Written commitment to respect this prevention plan from every concerned people;

.11 A Site inspection grid based on the preventive measures included in the prevention plan.

.3 Develop an effective emergency plan, related to characteristics and constraints of the Site. The emergency plan shall be given to all concerned, in accordance with Article 1.4-Submittal Procedures. The plan shall include:

.1 Evacuation procedure;

.2 Resources identification (police, firefighters, ambulances, etc.);

.3 People in charge of the Site;

.4 First-aid worker identification;

.5 Training required for the responsible people;

.6 And any other information that may be required because of the Site characteristics.

1.9 RESPONSIBILITIES

.1 No matter the size of the Site or the quantity of workers, Contractor shall refer a competent person as supervisor and health and safety responsible. Take all measures required to ensure health and safety of people and property on the Site that may be affected by some work.

.2 Take all required measures to ensure effective implementation and enforcement regarding health and safety requirements in contract documents, federal or provincial rules, standards and site-specific prevention plan. Comply with all orders or correction notice issued by an inspector without delay.

.3 Take all measures required to keep work area clean and tidy during the work.

1.10 COMMUNICATION AND DISPLAY

.1 Make all arrangements required to ensure effective communication of health and safety information on Site. As soon as they are on Site, all workers shall be informed about the particularities of the prevention plan, their obligations and their rights. Contractor shall insist on the right of all workers to refuse to perform work if they believe that this work may compromise their or other health, safety or physical integrity. Contractor shall keep a register with the information transmitted and the signature of all workers who received this information on Site.

.2 Following information and document shall be displayed in an easily accessible place:

.1 Project owner identification.

.2 Company health and safety policy.

.3 Site-specific prevention plan.

.4 Emergency plan.

.5 Data sheets for all controlled products used at Site.

.6 Minute of workplace committee meetings.

.7 Names of representatives on Site committee.

.8 First-aid workers names.

.9 Intervention and correction reports issued by inspectors.

1.11 UNFORESEEN

.1 When a hazard situation not specified in the specifications and not identifiable during the preliminary inspection of Site appears by the fact of during execution of work, Contractor shall stop work immediately, implement temporary protection measures for workers and for the public and notify the Departmental Representative by writing. Contractor shall make the required modification to the Prevention plan so that the work stays safe.

1.12 SITE INSPECTION AND DANGEROUS SITUATIONS CORRECTIONS

.1 Inspect Site and complete site inspection schedule at least once a week.

.2 Take, without delay, all required measures to correct exceptions to the laws, regulations and hazardous situations identified by the Departmental Representative, the Parks Canada Agency's health and safety coordinator, or during periodic inspections.

.3 Submit to Departmental Representative written confirmation of all measures taken to correct the exemptions and hazardous situations.

.4 Stopping Work: Contractor shall designate a person hired solely for the health and safety aspect. The application of this person shall be approved by the Departmental Representative. Grant to the person authorized by the Contractor to take care of health and safety, all the authority necessary to order the stoppage and resumption of work, when it deems it necessary or desirable to health and safety reasons. It will ensure that the health and safety of the public and site workers and the protection of the environment always take precedence over cost and schedule issues. Without limiting the scope of the section "Management of Health and Safety" and the section "Accountability", the Departmental Representative or any person authorized by the Parks Canada Agency to deal with the management or project supervision may, at any time, order the work to be stopped if, in its opinion, there is a danger or risk to the health or safety of the site workers or the public to the environment.

1.13 BLASTING

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

1.14 SAFETY MEASURES

.1 Recruit reliable security staff to ensure the supervision of the Site, materials and equipment after working hours and during holiday at Contractor's cost.

1.15 APPROVAL STAFF

.1 Not used.

1.16 SAFETY REQUIREMENTS

.1 Protective Equipment

.1 All site workers shall wear approved helmet and safety shoes, safety vest and glasses all the time.

.2 All visitors shall wear approved helmet and safety shoes, safety vest and glasses all the time.

.3 All other personal protective equipment is required depending on the type of work. Strict compliance with security standards as per rule s-2.1, r6.

.2 Prohibitions on Site

.1 Walkman, radio;

.2 Alcohol, drugs (or under the influence of…);

.3 Tobacco;

.4 Gum;

.5 Games;

.6 Weapons;

.7 Theft, vandalism;

.8 Fight;

.9 Construction light;

.10 All other activities that may cause a risk to persons or goods.

.11 Anyone who does not respect these prohibitions will be evicted from Site without further notice.

.3 Non-smoking Policy

.1 It is strictly **FORBIDDEN** to smoke on Parks Canada Agency Site.

.4 Guardrails, Temporary Openings and Dangerous Area

.1 Contractor is responsible to build, modify and replace all the fall protection (no deviation will be tolerated)

.2 Dangerous areas shall be identified with red or yellow band identified “Danger”. This procedure will be used indoor, that is a completely closed area with walls, floor and ceiling. For outdoor dangerous areas, Contractor shall identify the area with a yellow nylon rope with colored band properly tied every four (4) meters. These colour bands shall comply with the needs of the related work.

.3 All materials that may be blown away shall be sufficiently anchored to the ground or stored in closed container.

.5 Cleaning

.1 It is important to keep the Site clean all the time, to dispose waste daily and to hand hoses and extension cords. Contractor and subcontractor shall carry out a good cleaning once a week.

.6 Injuries and Accidents

.1 Contractor and each subcontractor shall appoint a first-aid worker before starting the work.

.2 Any accidents or near-accidents shall be stated to the immediate supervisor. The supervisor shall inform the Departmental Representative or the preventing officer designated by Parks Canada Agency.

.3 A first-aid kit is required in each Contractor’s trailer.

.7 Protect Traffic

.1 Contractor shall ensure that a signaling controller is available all the time to drive back dump trucks and any other delivery vehicle.

.8 Fire Protection

.1 Fire Protection Equipment. Contractor shall:

.1 Provide its own fire extinguisher of type ABC;

.2 Inspect equipment regularly;

.3 Provide fire extinguisher for each trailer and dredging equipment;

.4 Have the fire extinguisher pressure checked once a year.

.9 Confined space work

.1 Work and equipment comply with applicable codes and standards. Make sure that the Regulation Respecting Occupational Health and Safety for confined space work is respected, especially articles 3.21.1, 3.21.2 and 3.21.3 of the Safety Code for the Construction Industry (RRQ, c S-2.1, r 4).

.2 Carry out contaminant concentration readings in access well. During surveys in manholes, respirator selection is in accordance with CSA Z94.4.93.

.10 Environmental Protection

.1 Employers and workers shall comply with all rules, codes and laws promulgated by various government's level.

.2 Before mobilization, Contractor shall submit a complete list of contaminants to be used on site with their WHMIS data sheets to Departmental Representative.

.3 Work shall be carried out in such way to prevent discharge of liquid or solid waste, fuel, lubricants or other on the ground or water according to laws and regulations.

.4 If a worker or any other person on site notices the presence of a contaminant on the ground, he must notify his immediate superior. Departmental Representative must be informed as soon as possible. A report received from an approved site for decontamination shall be provided to the Departmental Representative by the related contractor.

.5 Recovery, cleaning, and pumping of spills will be at Contractor's cost and to the satisfaction of Departmental Representative or its authorized representatives.

.6 See section 01 35 43 – Environmental Protection for more information.

.11 Temporary Markup

.1 All water structures and equipment must be marked during the work.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Fire and Safety (DND)
Section 01 35 35

PART 1 GENERAL

1.1 FIRE DEPARTMENT BRIEFING

.1 Departmental Representative will take the required measures for the Fire Chief to forward the fire safety instructions to Contractor at the meeting prior to the start of the work.

1.2 REPORTING FIRES

.1 Know location of nearest fire alarm pull station and telephone, including emergency phone number.

.2 Report immediately fire incidents to Fire Department as follows:

.1 Telephone.

.3 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify location.

1.3 FIRE PROTECTION SYSTEM

.1 Existing fire protection and alarm systems will not be:

.1 Obstructed;

.2 Shut off or disabled;

.3 Left inactive at end of each working day or shift without written authorization from Fire Chief.

.2 Use of fire hydrants, standpipes or hose systems for purposes other than firefighting unless authorized by Fire Chief, is prohibited.

1.4 FIRE EXTINGUISHERS

.1 Supply fire extinguishers, as scaled by Fire Chief, necessary to protect work in progress and contractor's physical plant on site.

1.5 OBSTRUCTION OF ROADS

.1 Notify the Fire Chief for any work that may interfere with the movement of fire fighting vehicles, deviation from the minimum clearances prescribed by the Fire Chief, installation of barricades and carrying out excavation work.

1.6 SMOKING PRECAUTIONS

.1 Observe smoking regulations.

1.7 RUBBISH AND WASTE MATERIALS

.1 Keep rubbish and waste materials to a minimum.

.2 Burning of rubbish is prohibited.

.3 Waste removal:

.1 Remove rubbish from work site at end of each working day or shift or more frequently as directed.

.4 Storage:

.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.

.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove at end of each work day.

1.8 FLAMMABLE AND COMBUSTIBLE LIQUIDS

.1 Handle, store and use flammable and combustible liquids in accordance with National Fire Code of Canada).

.2 Store flammable and combustible liquids such as gasoline, kerosene and naphtha in quantities not exceeding 45 liters. Store in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Obtain written authorization from Fire Chief for storage of quantities of flammable and combustible liquids exceeding 45 liters.

.3 Transfer of flammable or combustible liquids within buildings or on jetties is prohibited.

.4 Transfer of flammable or combustible liquids in vicinity of open flames or any type of heat-producing devices is prohibited.

.5 Use of flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents is prohibited

.6 Keep on site the minimum quantity of flammable or combustible spent liquids; if required, store them in approved containers stored in a safe and well-ventilated area. Send any request for evacuation of these products to the fire department.

1.9 HAZARDOUS SUBSTANCES

.1 Perform work involving the use of toxic or hazardous materials, chemicals or explosives, or otherwise creating hazard to life, safety or health, in accordance with National Fire Code of Canada.

.2 Obtain a "Hot Works" permit from Fire Chief for hot works in construction area (welding or burning operations or the use of torches or heat-generating equipment).

.3 For work requiring the use of a heat source in areas where there is a risk of fire or explosion, ensure the presence of fire-safety officers equipped with appropriate extinguishing equipment. The Fire Chief will identify areas where there is a risk of fire or explosion and the safety measures to be taken in each case. It is the Contractor’s responsibility to retain the services of fire safety officers on the site, in accordance with the procedures previously established with the Chief of the Fire Department.

.4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used. Eliminate sources of ignition. Provide written notification to the Fire Chief prior to starting work and immediately at completion of work.

1.10 QUESTIONS OR CLARIFICATION

.1 Direct questions or clarification on Fire Safety to Fire Chief.

1.11 FIRE INSPECTION

.1 Site inspections by Fire Chief will be coordinated by Departmental Representative.

.2 Allow Fire Chief unrestricted access to work site.

.3 Cooperate with Fire Chief during routine fire safety inspection of work site.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 DESCRIPTION

.1 This section describes the environmental requirements related to the refurbishment work of the Lachine Canal outlet 2. The Contractor is responsible for respecting these requirements at all times during the performance of the work covered by this specification.

.2 Other sections may also contain specific requirements for environment protection. These specific requirements are additional to the requirements prescribed in this section. In case of contradiction, the most stringent requirement must be respected.

1.2 DEFINITIONS

.1 Special Status Species: Wildlife or flora species which are legally protected by the Act Respecting the Conservation and Development of Wildlife (Quebec) and/or Species at Risk Act (Canada).

.2 Exotic Invasive Species (EIS): Species that are alien to the current ecosystem, but capable of reproducing and having the potential to have harmful effects on economy, environment, biodiversity or health (ex.: Warbler). In addition to plants, EIS include some animals, fungi and microorganisms.

.3 MSDEFACC: Ministry of Sustainable Development, Environment, and Fight against Climate Change.

.4 Environment Pollution and Damage: Presence of chemical, physical or biological elements or agents that have a deleterious effect on the health and well-being of people, which alter ecological balances important for humans and which constitute an attack on species that play an important role for them or that degrade aesthetic traits, cultural or historical characteristics of the environment.

.5 Environmental Protection: Prevention / control of pollution and disturbance of habitat and environment during construction. Prevention of pollution and damage to the environment covers the protection of soil, water, air, biological and cultural resources; it also includes the management of visual aesthetics, noise and vibrations, solid, chemical, gaseous and liquid wastes, radiant energy, radioactive materials and other pollutants.

1.3 REFERENCES

.1 Environment Quality Act (LRQ, ch. Q-2)

.2 Canadian Environmental Protection Act, 1999 (L.C. 1999, c.33).

.3 Hazardous Materials Regulations (Q-2, r.32).

.4 Clean Air Regulation (Q-2, section 4.1).

.5 Solid Waste Regulations (Q-2, r.13).

.6 Regulation respecting the burial of contaminated soils (Q-2, r.18).

.7 Regulation respecting the landfilling and incineration of residual materials (chapter Q-2, r. 19).

.8 Storage and Transfer of Contaminated Soil Regulations (Q-2, r.46).

.9 Act respecting the conservation and development of wildlife (RSQ, C. C-61.1).

.10 Species at Risk Act (L.C. 2002, ch.29).

.11 Migratory Birds Convention Act, 1994 (L.C. 1994, ch.22).

.12 Wildlife habitat Regulations (C-61.1, r.18).

.13 Fisheries Act (RSC 1985, ch. F-15).

.14 Guidelines for the Management of Treated Wood (MSDEFACC, October 2011).

.15 Noise Guideline from Industrial Construction Site (MSDEFACC, March 2015).

.16 Soil Protection and Contaminated Sites Rehabilitation Policy (MSDEFACC, 1998).

.17 Quality Criteria for Surface Water (MSDEFACC, 2015).

.18 Canadian Environmental Quality Guidelines (CEQGs 1999).

.19 Canada-Wide Standards for Petroleum Hydrocarbons (PHCs) in Soil (CEQGs 2008).

.20 Regulation Respecting the Control of the Spread of Emerald Ash Borer on the Territory of the City of Montréal (15-040).

.21 By-law number 2008-47 on the Water Purification of the Metropolitan Community of Montreal (MCM, 2008).

.22 BNQ 2410-300 Standard - Products used as dust suppressants for unpaved roads and other similar surfaces (BNQ, 2009).

.23 Clean Air Regulation and replacing Community Regulations 44 and 44-1 (MUC No. 90, as amended by By-Laws Nos. 90-1, 90-2 and 90-3) (MCM, 1986).

.24 Limits and guidelines recommended by the Ministry of Sustainable Development, Environment and Parks for sound levels from a construction site (MSDEFACC, March 2015).

.25 Historic Canal Regulations (DSOR / 93-220).

.26 Regulation respecting noise (R.R.V.M. c. B-3) (City of Montreal, 1994).

.27 By-law No RCA13 22003 - By-law amending the By-law concerning noise (R.R.V.M., chapter B-3)

1.4 CONTRACTOR RESPONSIBILITIES

.1 The Parks Canada Agency is taking steps to obtain environmental authorizations for planned work. The Contractor must comply with the requirements of the conditions associated with each of the environmental authorizations.

.2 The work must be performed to the satisfaction of the Parks Canada Agency or of his Representative (Departmental Representative) with respect to environmental protection standards and regulations. The Contractor is required to comply with the environmental guidelines and must anticipate costs associated with these requirements.

.3 The Contractor must ensure that his work complies with:

.1 The requirements of conditions associated with each environmental authorization.

.2 Laws and regulations of municipal, provincial and federal environmental authorities.

.3 Other standards and guidelines that may be established by the supervisor designated by the Parks Canada Agency.

.4 The requirements set out in this specification.

.4 If work not provided for in the environmental authorizations issued is required by the Contractor, the latter, in addition to notifying and obtaining the approval of the Departmental Representative, shall obtain from the organizations concerned the authorizations and permits necessary to carry out its work. Costs and deadlines for compliance with and enforcement of the environmental requirements contained in these authorizations and permits must be anticipated and assumed entirely by the Contractor.

.5 An environmental protection plan shall be prepared by the Contractor and submitted to the Departmental Representative.

.6 The contract may be interrupted or canceled if the Contractor does not respect its obligations.

.7 The Contractor agrees to perform the work as directed by this specification and the instructions of the Departmental Representative at the time of the work.

.8 The Contractor must ensure that evidence is retained to demonstrate compliance of transactions.

1.5 NON-COMPLIANCE NOTICE

.1 A written non-compliance notice will be issued to the Contractor by the supervisor designated by the Parks Canada Agency whenever there is a finding of non-compliance with a federal, provincial or municipal law, regulation or permit, or any other element of the environmental protection plan to be implemented by the Contractor.

.2 Upon receipt of a non-compliance notice, the Contractor shall propose corrective measures to the Departmental Representative and shall implement them promptly with the approval of the Departmental Representative.

.3 The Contractor must wait for the written approval of the Departmental Representative before proceeding with the implementation of the proposed measures.

.4 If necessary, Departmental Representative may stop work until satisfactory corrective action is taken.

.5 No additional time and no adjustment will be granted following the work stoppage.

PART 2 PREPARATION

2.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Safety Data Sheets (SDS):

.1 Submit Safety Data Sheets (SDS) and manufacturer's instructions and documentation for hazardous materials used on site. The sheets must indicate the characteristics of the products, in accordance with the Workplace Hazardous Materials Information System (WHMIS 2015).

.2 The Contractor must submit all authorizations or permits required for the work described in this specification for which he is responsible to obtain. These authorizations or permits are at the expense of the Contractor.

.3 Environmental Protection Plan (Templated included in Appendix B) and Emergency Measures Plan:

.1 Before the start of construction activities or the delivery of materials and equipment to the site, the Contractor must submit an environmental protection plan and an environmental emergency plan (including a communication protocol) to the Departmental Representative for review and approval.

Plans must provide a comprehensive overview of known or potential environmental issues to be addressed during construction.

.2 The Contractor's Environmental Protection Action Plan must demonstrate how the Contractor intends to meet or consider the stated objectives. The Contractor must also demonstrate in his action plan how he intends to apply the requirements of this specification to avoid any damage to the environment. This action plan must be submitted to the Departmental Representative for approval, seven days (7) before the start of the work.

.3 Certain elements of the action plan are unknown before the start of the work, so they must be presented to the Departmental Representative for approval as the work progresses, and this, seven (7) working days before their installation or implementation.

.4 The Environmental Protection Plan shall be presented in the form of working methods, procedures, sketches and using small format construction plans (or any equivalent document) describing the location and nature of proposed methods.

.5 The emergency plan shall include at least the following:

.1 Potential hazards.

.2 Protection measures.

.3 Procedures and measures to be implemented and anticipated actions in the event of an incident or spill.

.4 Contact information of persons in charge.

.6 The environmental protection plan must include as minimum the following:

.1 The names of persons to ensure compliance with the plan, including the contractor's environmental manager, and the communication diagram for the construction site. The Environmental Manager must be other than the Project Manager, Superintendent or the Foreman.

.2 The name and skills of those responsible for manifesting the release of residual hazardous materials or toxic waste to be evacuated from the site.

.3 Names and skills of those responsible for training site personnel.

.4 A description of the training program for environmental protection personnel and the frequency of environmental awareness sessions for workers.

.5 Construction Order.

.6 A Soil and Sediment Management Plan to prevent erosion and sediment transport and to minimize the risk of sedimentation of the waterbody at all stages of the project.

.7 A cutting and / or plant protection plan. This plan must be approved by the Departmental Representative prior to the commencement of deforestation or excavation work.

.8 An EIS Management Plan outlining the steps that will be taken to prevent their introduction and / or dispersal. This plan should include layout methods.

.9 Drawings showing location of temporary excavations, site areas, site offices, parking lots, access roads, material storage areas, concrete washing areas (if applicable), refueling areas, sanitary facilities, waste storage areas, construction-demolition materials, hazardous materials and residual hazardous materials, as well as an illustration of the methods that will be used to control runoff and erosion control and to confine materials to the site.

.10 Traffic Control Plans, including measures to reduce erosion of temporary roadside platforms by vehicular and machinery traffic, particularly during rainy weather. These plans must include measures to reduce the transportation of materials on public roads by vehicles or runoff.

.11 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. This plan must include measures to mark the limits of useable areas and methods of protection of the elements within authorized work areas to be preserved.

.12 A plan for the management and disposal of non-hazardous residual materials, construction-demolition residues, excavated materials and hazardous residual materials including management methods and final disposition locations.

.13 Air pollution prevention plan, specifying measures to retain dust, debris, materials and residual materials inside the site.

.14 A Contamination Prevention Plan identifying potentially hazardous substances that will be used on the site, the measures to prevent these substances from being suspended in the air or being introduced into the soil, as well as the details of the hazards, measures that will be taken to ensure that the storage and handling of these substances comply with federal, provincial and municipal laws and regulations.

.15 A Wastewater Management Plan, indicating the methods and procedures to be implemented for the management or disposal of wastewater directly from construction activities, such as water used for curing concrete, water washing / cleaning, disinfection, hydrostatic testing and flushing of pipelines.

.16 A potentially contaminated precipitation, runoff and pumping management plan, indicating the methods and procedures to be used for the characterization, treatment, if required, and management of contaminated water.

.17 If required, Contaminated Soil Management Plan to be submitted for approval by Departmental Representative before starting the Work. Complementary characterization may be required if the quality of the soils is not known precisely or in case of discover of potentially contaminated soil.

.18 Materials imported to Site shall come from authorized borrows pits and quarries, be clean and free from contaminants or undesirable species.

.19 Actions includes in the Environmental Protection Plan shall be sufficiently detailed to be in accordance with environmental issues and with construction and/or demolition work to be carried out.

PART 3 EXECUTION

3.1 USE OF THE LAND

.1 Notify Site users of work and work schedule.

.2 Coordinate with local stakeholders. Display adequate ground and water signage for users.

.3 Plan extra routes and set up the road marking required around the construction site for the traffic of the staff, the pedestrians and the vehicles.

.4 Respect the work schedule of the municipal regulations.

.5 Do not interfere with recreational traffic or with the use of picnic areas and ensure workers' protection.

.6 No equipment, materials or debris shall be left in the waterway or obstruct navigation. Limit the traffic of the machinery to predefined areas only.

.7 Leave the site in its original conditions at the end of the Work.

3.2 VEGETATION PROTECTION

.1 Plan the use of work zones already subjected to disturbance in order to minimize area of disturbance.

.2 Identify the boundaries of access roads and work areas in order to protect sensitive environment and preserve vegetation cover and prevent drainage or rejects to sensitive environment.

.3 No site clearing is planned during the works and deforestation is forbidden. However, in case this situation shall happen, measures shall be put in place after Departmental Representative approval and authorizations required as appropriate:

.1 Limit felling / pruning and clearing to the minimum required for the work in order to preserve as much of the vegetation as possible;

.2 The areas to be cleared must be identified by marking before the beginning of the felling work;

.4 No deforestation will be permitted outside the Parks Canada property;

.5 Establish and delineate a protection area around trees and shrubs to be preserved (eg fences, ribbons, barriers, etc.) to prevent damaging them or their root system. If this is not possible, install a protection system for the trunks and the root system (wooden planks, non-compacting material with geotextile, etc.).

.6 If a tree or part of a tree (independent of the height) is damaged by the Contractor, it must obligatorily mandate, at its expenses, a forest engineer so that it determines the nature of the damage, the state of the tree, the correction methods to be applied, the interventions to be planned, an evaluation of the survival potential of the tree and any other recommendation and complete, at its expense, the corrective work. The results of this evaluation shall be submitted to the Departmental Representative in a report. The Contractor must use planks of wood or other carpets to protect the surface roots of trees and shrubs.

.7 Trees cannot be used as support in any cases;

.8 Trees felled with the prior approval of the Departmental Representative and damaged vegetation that does not interfere with the completion of the work will be replaced and / or restored by the Contractor.

.9 Deforestation activities that include the presence of ash trees must meet the requirements of the Regulation against the spread of Emerald Ash Borer on the territory of the City of Montreal and will be managed according to this regulation (ex. Ash cutting allowed only during certain times of the year);

3.3 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 Provide a plan that defines procedures for identifying and protecting historical, archaeological and cultural resources known to be on project site; and identifies procedures to be followed if resources not previously known to be onsite or in area are discovered during construction.

.2 The plan must include methods to ensure the protection of known or discovered resources (including the protection of archaeological soils from the movement of machinery), as well as communication means between the Contractor's personnel and the Departmental Representative.

.3 A location plan for the mobilization areas (and machinery type) must be pre-approved by the Departmental Representative prior to the start of the work, as well as any project modification.

.4 Comply with any special requirements defined by the Departmental Representative.

.5 If an archaeological remains (remains of construction or development, object and fragment of an object) is the subject of a fortuitous discovery during excavations in the absence of an archaeologist, the contractor must suspend the work in the immediate area of the discovery and notify the Departmental Representative, who will then take the necessary measures to protect and conserve the said archaeological remains. Work may continue in another area.

In areas where Parks Canada Agency considers that the potential warrants it, an archaeologist shall supervise work likely to damage elements of heritage interest. If necessary, the work will be stopped by the archaeologist to analyze the situation and to define needed actions.

3.4 FISH AND HABITAT PROTECTION

.1 Notice under the Fisheries Act is required for this project to determine if an authorization is required, as there will be excavation in fish habitat and modification of its susbtrate. Additional DFO requirements must be met, if applicable.

The following specific measures must be carefully applied:

.1 No permanent encroachment is authorized in fish habitat, except as provided for in the plans and validated by DFO.

.2 Temporary encroachments shall be minimized to avoid loss of fish habitat and shall be approved by Departmental Representative.

.3 The use of dry working methods must be preferred to minimize work directly in the water.

.4 Construction materials used in a waterway shall be handled and used to prevent the release or leaching of substances that may be harmful to fishes.

.5 An action plan shall be developed and implemented immediately in the case of a sediment release or spill of a deleterious substance and an emergency spill kit must be kept at site.

.6 Removal of riparian and aquatic vegetation should be minimized.

.7 Working area shall be clearly delineated from the water body (physical separation).

.8 If temporary access or work platforms are required at the bottom of the canal, these must be set up in such a way that the environment will return to its original state once the work has been completed.

.9 The banks should be stabilized after work, if necessary.

.2 No machinery and/or equipment movement is permitted directly in the waterway without the prior approval of the Departmental Representative. The method of access to the bank or to the canal shall minimize the movement of machinery. This access method shall first be approved by Departmental Representative and must provide the mitigation measures.

3.5 EXOTIC INVASIVE SPECIES

.1 Efforts must be made to avoid the spread of Exotic Invasive Species (EIS) while carrying out work on the different sites.

.2 Exotic Invasive Species listed on site, but no limited to:

.1 Plants

.1 Phragmite (Reed)

.2 Eurasian Watermilfoil

.3 Reed canary grass

.2 Animals

.1 Zebra mussel

.2 Tench

.3 Round goby

.3 Machinery and equipment maintenance and cleaning shall be carried out before and after performing the Work to avoid colonization by Exotic Invasive Species (EIS), both terrestrial and aquatic.

.4 Ensure that the machinery is clean and free of invasive species and weeds when arriving at the site and maintain this condition thereafter.

.5 Cleaning of equipment that has been in contact with EIS shall be done away of the Canal and areas suitable for seed germination.

.6 Banks and seagrass inspection for the various working zones shall be carried out before starting the work to identify the presence of EIS. Inspection shall be carried out after the end of the work (3 months deadlines or during the next growing season) to ensure that such species are not propagated. Corrective work could be requested from the Contractor if EIS are introduced into the environment.

.7 If EIS must be cut, place in an airtight container to prevent dispersion and dispose of in an authorized place.

.8 Contrary to what is required in article 3.10.1.4 of this specification, if specimens of tench or black-spotted goby are found inside temporary structures, they must not be returned to the water. Identification of these species should be done by a fish biologist.

.9 In the case where EIS have been introduced during the work, proceed quickly to the eradication of individuals according to techniques recognized for the type of species observed.

.10 No pesticide can be applied within 3 meters of the high-water mark. If pesticides are required elsewhere on the site, a pesticide treatment plan must be submitted to the Departmental Representative for approval.

.11 If materials used for temporary works are recovered for later use in another stream, clean them to prevent the spread of zebra mussels and other EIS.

3.6 SITE FACILITIES AND ACCESS

.1 Access to work site will be limited and only authorized persons will have access to site.

.2 Limit the circulation of machinery and storage of materials to previously defined areas.

.3 Access must remain free of all type of materials (soil, debris, stripping materials, etc.) and shall be rehabilitated after Work.

.4 Vehicle access roads and mobilization areas will be limited to existing roads and parking lots and other Parks Canada disturbed areas. If undisturbed areas are to be used, then protective measures will be needed such as the placement of a geotextile cloth covered with gravel.

.5 Prioritize the storage of construction materials on paved or concreted surfaces.

.6 Respect the speed limits established on the site (10 km / h).

.7 Store any potentially contaminated material on a sealed surface and cover it to prevent erosion by wind or surface runoff of particles.

.8 Equipment and machinery may not be stored above the root system of trees, within a minimum of 3 meters from the center of the trunk or within the projection limit of the ground.

.9 Install a protective surface (eg, wooden planks, granular materials) for machinery circulation in the bottom of the canal to avoid sediment compaction. Make sure that the channel bed is dry beforehand.

.10 Cover the bottom of the canal, the banks and all surfaces that will be affected by the temporary layout with a thick non-woven geotextile. This measure is used to facilitate the recovery of materials during the dismantling of the structure and to protect the integrity of the soil in place. If granular material is deposited at the bottom of the canal, ensure that the geotextile is sufficiently protruding on each side of the material.

3.7 DRAINAGE

.1 Provide temporary drainage and pumping required to keep excavations and site free from water. Pumped water shall be managed in accordance with the applicable regulations and these specifications.

.2 Runoff water into the workspace shall be confined, tested and treated, if required.

.3 Work methods must be adapted accordingly if a sudden increase in suspended solids occurs (slowing down work, decreasing pumping rates, adding settling ponds, etc.).

.4 Materials to be controlled include but are not limited to: gravel, clogging residues, resins, cladding materials, lubricants, injection products, oils and greases, cleaning muds, rinsing water, pumping water and runoff.

.5 The Contractor must avoid any direct discharge of water from the site and equipment into environment. Pumping water and/or wastewater generated on site must be tested regularly in accordance with provincial and municipal regulations. If pumping water and/or wastewater do not meet the discharge criteria in force, must be treated on the site by the installation of a settling basin or other treatment system outside site before release to environment.

.6 Precipitation, runoff and pumping water must be tail a sedimentation pond or filtration structure to reduce particle inputs to the Canal. Discharge of water to a watercourse, sewer system or drainage must meet Quality Criteria for Surface Water of MSDEFACC (protection of aquatic life), CMME (water quality-protection of aquatic life) and by-law number 2008-47 on the Water Purification of the Metropolitan Community of Montreal (MCM). For discharge to water stream, the maximum allowable release standard for suspended solids (SS) is 25 mg/L above background concentration. The sampling point is at the outlet of the pipe at the point of discharge.

.7 Any incidental discovery of unknown or potentially contaminated waters must be reported to the Departmental Representative without delay. Where appropriate, a characterization of these waters must be carried out prior to their treatment and disposal by the Contractor.

.8 Contaminated water management as follow:

.1 Pumping and temporary storage in tanks or in watertight containers;

.2 Use of a vacuum truck from an authorized contaminated liquid management service;

.3 Mobile treatment unit for contaminated water.

.9 If a vacuum truck from an authorized company is used, the recovery report (in liter) of the company must be submitted to the Departmental Representative daily.

.10 Works in the Canal must be stopped during adverse weather conditions that do not meet the criteria established.

.11 Ensure all authorizations for the use of mobile treatment unit for contaminated water.

3.8 WILDLIFE PROTECTION

.1 Restriction periods

.1 If required and pre-approved by Departmental Representative, the removal of vegetation (grass, shrubs, trees) shall be carried out outside the breeding season of avian species (birds) and bats, which generally extends from April 1st to August 31 for most species in the south of Quebec. Bird species with status as well as migratory species are protected, as well as their nest. Work during the nesting season involves the protection of nests and chicks until they have left the nest.

.2 If the Works have to be carried out during this period of nesting, an inventory shall be carried out prior to the planned activities that may have an impact on the nests (e.g. Deforestation). In the case of nesting discovery and depending on the species listed and of their legal protection status (Migratory Birds Convention Act, 1994), a protection zone may need to be established until the fledging of the chicks.

.3 Work in water must be carried out outside the reproduction period of ichthyofauna species, which extends from April 1 to July 31. If this measure cannot be met, Work in water must be conducted to minimize environmental impacts (see specific measures in Fish Habitat Protection section).

.2 If an animal is observed in or near the site, give it the opportunity to leave the area and move away from potential conflict areas. If the animal does not leave the premises by itself, notify the Parks Canada Representative who will take the necessary steps to move the individual.

.3 In the case of turtles, they must be relocated. The work will have to be suspended until the individuals can be relocated. The capture and relocation must be undertaken by a qualified person.

3.9 WORK ADJACENT TO OR IN WATERWAYS

.1 Prior stating the work, Departmental Representative must approve the location of areas designated for activities that may affect the quality of the environment, such as storage, oil handling, and equipment cleaning and maintenance areas.

.2 All work in waterways shall be isolated from free water or stream to prevent the addition of sediments or debris in the water.

.3 Work adjacent to waterways shall be planned and carried out to prevent materials such as concrete, paint, primers, pickling abrasives, anti-rust solvents, degreasers, grout or any other chemical product to end up in the waterway.

.4 Erosion and sediment control measures:

.1 Shall be implemented, in the case of work on the banks of the canal, until disturbed soils are permanently stabilized, suspended sediments are deposited in the bottom of the sedimentation pond, and reject water is clear. The maximum allowable release standard for suspended solids is 25 mg/L or 10% over background concentration.

.2 Soils must be stabilized wherever there is a risk of erosion to prevent the intake and emission of particles. Surface protection materials (e.g. wood fiber mat, mulch, membrane, stone) will be provided before starting the work.

.3 Inspection and regular maintenance of soil and sediment erosion control measures shall be carried out during the works. If necessary, cover bare floors in case of rain quickly.

.4 Sediment barriers (barrier with geotextile or retaining strand) to be installed, but not limited to, at the following locations: at the bottom of slopes, around a work area, parallel to Canal and around any piles of non-consolidated materials.

.5 Work requiring a more severe obstruction of the Canal that may cause greater impacts on the hydrological regime must be carried out in the fall, when the water level of the Canal is lower.

.6 Minimize work in water.

.7 If Work is carried out in the water during the summer, measures implemented to drain a part of the waterway (e.g. temporary works) shall allow the free flow of water, both for the aquatic wildlife and for the recreational water sports.

.8 No debris excavated materials or waste shall be released in the waterway. Any debris accidentally introduced into the aquatic environment shall be removed quickly to keep the water clean and free of contamination.

.9 Ensure that no deleterious substance is immersed or released in an aquatic environment or placed in a place that could contaminate the aquatic environment, as required by section 36 (3) of the Fisheries Act and section 5.1 of the Migratory Birds Convention Act, 1994.

.10 Provide debris collection measures during rehabilitation/demolition of concrete structures (spill crests, walls, etc.) and other structures (debris grates, valves, hydraulic system, etc.) to prevent debris into the water (e.g. use of hydraulic breaker). Pay attention to limit the movement of the particles into the water when removing from site.

.11 No piles, materials or equipment shall be stored in the aquatic environment and/or on the banks.

.12 No borrow material to be taken from the Canal.

.13 Equipment and materials that have been in contact with water and will be reused in another watercourse must be cleaned to prevent the spread of EIE such as zebra mussels.

3.10 DEWATERING

.1 If dewatering is required, Contractor must follow the following measures:

.1 Prior to the installation of temporary works in the Canal and if the water level is such that there is a flow, a turbidity curtain must be installed in the Lachine Canal so as to surround completely the work area and prevent the dispersion of soil and fine particles in the body of water, throughout the duration of the excavation work until the final backfill (including the removal of temporary installations and during setting up the dry workspace).

.2 Turbidity curtain must be kept in place during water works and removed at the end of Work, only after the removal of the temporary works and the complete decantation of the suspended materials.

.3 Turbidity curtain shall comply with the following specifications:

.1 Vertical height must be adapted to the depth of water and the potential fluctuations of the water level so that it rests entirely on the bottom of Canal.

.2 Restrained and ballasted at the bottom of the water to follow the asperities.

.3 Anchored on the shore and cover the entire work surface.

.4 Cleaned as needed during Work if the filter membrane is clogged.

.4 Fish inside temporary structure enclosure shall be captured manually with the help of a fish net and relocated in Lachine Canal, upstream of works area. Capture and relocation of fish must be undertaken by a qualified person.

.1 Install screen at intakes and outlets to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and can not escape. Impingement occurs when a trapped fish is kept in contact with the entrance screen and cannot be released. The design of the screens as well as their installation, maintenance and cleaning must be carried out in accordance with the *Interim code of practice: End-of-pipe fish protection screens for small water intakes in freshwater* of DFO (available at the following link: https://www.dfo-mpo.gc.ca/pnw-ppe/codes/screen-ecran-eng.html).

.2 Contractor shall gradually lower water level in the temporary works enclosure to facilitate catching fish. Refer to Section 3.7.5 for pumping water discharge.

.3 Special attention shall be paid to the presence in Canal of two species with special status, the American eel and the American shad. All precautions must be taken when setting up temporary structures and during the rescue of fish that may be retained inside them during dewatering.

.4 Fish found inside temporary structures must be carefully returned to the water before dewatering.

.5 Restore the Canal to its original conditions at the end of the Work (granulometry, elevation, slope).

3.11 WATERWAYS PROTECTION AND WATER PLAN

.1 Do not drag materials or debris from one side of the Canal to the other.

.2 Prior stating the work, Departmental Representative must approve the location of areas designated for activities that may affect the quality of the environment, such as storage, oil handling, and equipment cleaning and maintenance areas.

.3 Sediments and soils temporarily stored at the shore shall be dried prior to disposal, if applicable. Dewatering by temporary sedimentation basin method shall be preferred. It involves the use of a temporary basin mounted on a steel structure, adjustable to the desired volume, and equipped with a geo-membrane that acts as a filter to dry sediments / soils.

.4 Erosion and sediment control measures shall be carried out as quickly as possible until the disturbed soils are permanently stabilized.

.5 Soils must be stabilized wherever there is a risk of erosion to prevent the intake and emission of particles. Surface protection materials (e.g. wood fiber mat, mulch, membrane, stone) will be provided before starting the work.

.6 Inspection and regular maintenance of soil and sediment erosion control measures shall be carried out during the works.

.7 If necessary, cover bare, stone or membrane soils in case of rain quickly.

.8 Ensure that construction materials used in the canal are handled and used in a manner that prevents release or leaching into the canal water of substances that may be harmful to fish. The use of materials with particles smaller than 5 mm is prohibited.

3.12 WORK AND MATERIAL CONTROL

.1 Soil, Materials and Sediment Control

.1 All necessary measures must be taken to minimize the suspension and transport of fine particles in the Canal.

.2 Contractor shall plan a drainage system for the work areas and provide stabilization measures at stacking sites to avoid runoff into the Canal.

.3 Runoff water inside the work and storing areas must be confined, sampled and treated, if required.

.4 Sediment barriers (barrier with geotextile or retaining strand) to be installed, but not limited to, at the following locations: at the bottom of slopes, around a work area, parallel to Canal and around any piles of non-consolidated materials.

.5 Temporary non-consolidated material piles located within 30m of an aquatic environment and left in place for more than 24 hours shall be protected with a sediment barrier and cover with a geotextile to prevent sediment transportation in aquatic environment.

.2 Final management of sediments and contaminated soils

.1 Guidelines of the MSDEFACC Soil Protection and Contaminated Sites Rehabilitation Policy and the requirements of the Land Protection and Rehabilitation Regulation shall be respected during the storage and disposal of soils.

.2 Any discovery of soil contamination (visual sign or smell) shall be reported immediately before proceeding with the work. Report any discovery of potential contaminated and uncharacterized material to Departmental Representative.

.3 If required, a characterization of these soils must be carried out prior to their reuse or disposal by the Contractor. All requirements of this section shall be respected.

When disposing soils and sediment off-site, a written admission proof (transport coupon indicating the nature of materials and their quantity) to an authorized MELCC site shall be submitted to the Departmental Representative.

.3 Water management

.1 Adapt work methods accordingly if a sudden increase in suspended particles occurs (e.g. Slowing down work, decreasing pumping rates, adding settling ponds, etc.).

3.13 CONCRETE WORK

.1 Carry out concrete work and concrete washing in accordance with section 01 74 00 – Cleaning.

.2 Excess concrete and cement from concrete mixers shall be poured into sealed containers to facilitate their reuse or disposal. Concrete residue shall be managed with construction waste in an authorized disposal site.

.3 Washing water of concrete mixers shall be collected in a sealed basin arranged in such a way to avoid any leak into environment. Cleaning area shall be located more than 15 m from the Canal, within the boundaries of the site and shall be authorized by Departmental Representative. In case of impassability, cleaning area shall be impermeable and have the capacity to contain all washing water in case of spill or leaks. Work shall be carried out under the constant supervision of the Contractor.

.4 Washing water shall not be discharged directly into a waterway or on the ground. Washing water may be taken care of by the concrete supplier and brought back to the concrete plant for disposal. Otherwise, these waters shall be contained, sampled and treated (if applicable) to meet the surface water quality criteria of the MSDEFACC (protection of aquatic life) and law number 2008-47 on the Water Purification of the Metropolitan Community of Montreal (MCM) prior to their release into environment, an evacuation or drainage system. In the event of leak into the storm water system or waterway, the concentration of SS shall not exceed 25 mg/L above background concentration and the pH must be between 6.0 and 9.0.

3.14 EQUIPMENT, VEHICLES AND MACHINERY

.1 Traffic on Site

.1 The boundaries of the access road and work areas shall be clearly identified on Site. Machinery traffic shall be only done within designated access roads and work areas and, on durable surfaces present or shall be arranged in such a way to avoid the creation of ruts and the transport of sediments towards the Canal.

.2 Reduce movement of vehicles and machinery during adverse weather condition.

.3 It is forbidden to ford a water stream.

.4 The machinery must not at any time circulate directly on the sediments of the canal bed.

.5 Contractor shall not leave equipment or machinery within 10 m of the Canal outside working hours or during prolonged site closures.

.6 The operation of any unused equipment shall be interrupted.

.2 Machinery Fueling and Maintenance

.1 Machinery will be inspected before starting the Work to ensure that they are in good condition, clean and free of oil leaks or other contaminants. Inspection shall be performed daily or weekly depending of machinery use. Exhaust and pollution control systems shall be inspected and repaired as needed.

.2 Machinery used within 15m of Canal shall use vegetable or biodegradable hydraulic oil.

.3 Remove dust and debris on temporary roads.

.4 Machinery and equipment with leaks shall be immediately repaired or removed from Site.

.5 Machinery and equipment maintenance, refueling and cleaning or petroleum shall be carried out on a site designated for this purpose where there is no risk of contamination to soil, water, groundwater or surface water. This site shall be located more than 15 m from any body of water. Otherwise, the surface of this site shall be impermeable and have the capacity to contain all hydrocarbons in case of spills or leaks. All these activities shall be carried out under constant surveillance by contractor.

.6 Place machinery on impermeable mats or cloths before refueling or use containment equipment to contain any spills or leak.

.7 Install a mud recovery bed at the exit of Site.

3.15 FIRES

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

.2 Provide adequate supervision to work areas and fire protection measures.

3.16 AIR QUALITY PROTECTION

.1 No particle or dust emissions are tolerated on site above the standards established by the Clean Air Regulation (Q-2, r 4.1), that is dust that is visible to more than 2 m from the source.

.2 Water will be preferred for controlling suspended particulate emissions, particularly for surfaces with a coating. If other type of dust suppressant used, conform to BNQ 2410-300 Standard - Products used as dust suppressants for unpaved roads and other similar surfaces.

.3 Dump trucks carrying granular materials, which may contain fine particles shall be provided with waterproof tarpaulins.

.4 Contractor shall:

.1 Avoid idling any vehicle, equipment and machinery when not used.

.2 Repair quickly equipment and machinery that produces excessive exhaust fumes emissions.

.3 Keep equipment pollution control system in good condition.

.4 Metropolitan Community of Montreal (MCM) Clean Air Regulation (Regulation 90, 2001-10) shall be respected. Contractor must obtain permits or authorizations required to execute the Woks.

3.17 PROTECTION AGAINST NOISE AND VIBRATIONS

.1 Noise levels in accordance with Noise Guideline from Industrial Construction Site (MSDEFACC):

.1 From 7h to 19h: 55 dBA L_{Ar}, 12h, or initial noise level if it is higher.

.2 From 19h to 7h: 45 dBA L_{Ar}, 1h, or initial noise level if it is higher.

.2 The Contractor is required to comply with the requirements of the City of Montreal, namely the Noise By-law (R.R.V.M. c. B-3). Since the work area touches the Ville-Marie borough, the following regulations must also be observed:

.1 By-law concerning nuisances caused by construction work (CA-24-102) of the Ville-Marie borough

.3 Contractor shall control sound levels at Site by the following measures:

.1 Machinery, equipment and any vehicles shall have functional silencers all the times. The good condition of each equipment will be verified.

.2 Slamming of the rear panels of dump trucks shall be avoided all the time.

.3 Promote the use of low noise level equipment (e.g. hydraulic equipment).

.4 If required, threshing shall be started gradually at the beginning of daily activities and after a pause of more than 30 minutes, to allow fish to move away.

3.18 PROTECTION OF QUALITY IF LIFE

.1 Concerned authorities and the inhabitants of the affected areas shall be informed of the characteristics and stages of Work. Contact information for the person to contact in the event of a complaint shall be provided.

.2 Normal work schedule is from Monday to Friday between 7h to 17h. Population shall be informed of the schedules, especially during the works which can generate particular nuisances. Work schedule must comply with municipal regulations.

.3 If the Contractor anticipates work during weekends, holidays or nights, written notice must be submitted to the Departmental Representative at least five (5) working days before the work. The Departmental Representative reserves the right to approve or impose certain conditions.

.4 Site layout and construction schedule shall be planned considering reduce noise impacts and preserving the quality of life.

.5 The production of dust, smoke and any form of atmospheric or noise pollution shall always be minimized in Site.

.6 Bike paths, trails, picnic areas and other attractions along the Canal must always be cleaned to ensure a pleasant visit and enjoyable use.

.7 Excavated materials shall be transported to final disposal privileging the use of highway system to avoid traffic to sensitive areas (e.g. residential, bike path).

.8 Work shall be planned for Fall, as far as possible, when the use of pedestrian paths is lower and nautical activities are no longer passable on the Canal.

.9 Minimize areas closed to the public and delimit correctly work and storage areas.

.10 Temporary fences shall be installed to delimit work and storage areas to ensure the safety of the premises.

.11 If work is carried out during nautical activities period in the Canal, signaling shall be installed to announce obstacles in the Canal before starting Works.

3.19 HYDROCARBONS AND HAZARDOUS MATERIALS MANAGEMENT

.1 Petroleum products and all other hazardous materials shall be stored more than 15 m from Canal. Designated areas site shall be impermeable and have the capacity to contain all petroleum products and all other hazardous materials hydrocarbons in case of spills or leaks. All these activities shall be carried out under constant surveillance by contractor. The storage of hazardous materials shall comply with the requirements of the Regulation respecting hazardous materials.

.2 Stationary equipment and machinery (generators, compressors, etc.) shall be equipped with oil recovery bins to prevent from leaks or spills (volume equivalent to at least 125% the fuel tank volume of the equipment or machinery). These bins shall be functional all the times.

.3 Provide data sheets for the products to be used, at least 48 hours before arriving at the site for review by Departmental Representative.

.4 Disposal of new hazardous materials is prohibited. Take back all unused hazardous materials to leave the site perfectly clean at the end of the Work.

.5 Hazardous residual materials shall be disposed in accordance with section 02 56 13 – Management of Waste.

3.20 SPILLS AND ENVIRONMENTAL INCIDENTS PREVENTION

.1 Good practices must be adopted to avoid spills from machinery or equipment into water.

.2 Petroleum products shall be stored, handle and carefully used on a stable and impermeable surface, and not accessible after working hours.

.3 Contractor shall not leave equipment or machinery within 10 m of the Canal outside working hours or during prolonged site closures.

.4 Stationary equipment and machinery located near to Canal shall be equipped with oil recovery bins to prevent from leaks or spills (volume equivalent to at least 125% the fuel tank volume of the equipment or machinery). Inspect bins during rainy periods to prevent them from overflowing.

.5 Waters from recovery bins of the petroleum equipment shall be sampled and treated (if applicable) to meet the surface water quality criteria of the MSDEFACC (protection of aquatic life) and law number 2008-47 on the Water Purification of the Metropolitan Community of Montreal (MCM) prior to their release into environment, an evacuation or drainage system. Release must be approved by Departmental Representative.

.6 Immediately notify Departmental Representative and Environment Canada Emergency Services for any environmental incident or spill (see 3.20.6.6 below) and comply with the following:

.1 Check for leaks.

.2 Contain spilled material and prevent that reach sensitive areas.

.3 Collect contaminants and contaminated materials and dispose of in site authorized by MSDEFACC. Submit disposition evidence to Departmental Representative.

.4 If a spill occurs then a characterization of soils, of backfill material, of sediments or of contaminated water is required. Disposal in accordance with regulations in force.

.5 Submit to Departmental Representative, within 24 hours of the incident, a detailed event report including the description and location of the incident, the spilled product and the quantity, date and time, and the name and phone number of the person who found the incident.

.6 For environmental incident, Contractor is responsible to communicate with the authorities quickly when becoming aware of the event. Contact Departmental Representative, Environment Canada Emergency Services (1-866-283-2333), Environment Quebec Emergency (1-866-694-5454) and any other authority having jurisdiction over environmental emergencies. For a marine source spill contact the Canadian Coast Guard (1-800-363-4735). Recovery and disposal of contaminants and contaminated elements will be carried out in accordance with the regulations in force.

.7 Contractor is responsible for paying all costs related to the characterization, decontamination and disposal of contaminated soil following a spill or leak of a contaminant arising directly or not from its activities. The contractor must dispose of these contaminated materials at a site dully authorized by MSDEFACC.

.8 It is forbidden to mix contaminated soils with clean soils or with less contaminated soils or material to dispose of them in a less restrictive way.

.9 Keep a sufficient number of emergency kits for the recovering of petroleum products on Site. Kit shall contain enough absorbent material to allow a quick and effective intervention, both in the water and across the waterway, as well as on the ground around the machinery involved. Kits to be easily accessible all the time for quick response anywhere on the Site. Staff on Site shall know kit's use and location, have access to it and be able to adequately contain any accidental release of contaminants without delay.

.10 Development and implementation of contingency plans for accidental spills of contaminants shall be included in the Environmental Protection Plan. Workers shall have access to alert structures and managers names and phone numbers.

3.21 MANAGMENT OF TOXIC WASTE

.1 Contractor must keep the premises clean and progressively collect unused residues and materials by promoting their recovery and recycling as much as possible.

.2 Waste materials shall be sorted by category (residual materials, dry materials, hazardous residual materials) and shall be dispose in accordance with Regulation respecting hazardous materials (Q-2, r. 32), Regulation respecting the landfilling and incineration of residual materials (Q-2, r. 19) and Regulation Respecting Hazardous Materials (Q-2, r. 32).

.3 Accumulation of solid waste on the site shall be avoided. Residual materials shall be accumulated in appropriate containers and shall be dispose frequently to a site authorized by the MSDEFACC. Solid waste and dry materials shall be managed in accordance with Regulation respecting the landfilling and incineration of residual materials.

.4 Hazardous residual materials will be contained in identified leak-proof containers and transported to a temporary and secure storage area located on Site prior to disposal in a site authorized by the MSDEFACC, in accordance with Regulation Respecting Hazardous Materials.

.5 Collect unused materials, residual materials, waste and debris at the end of Woks.

.6 Used oil must be collected, barreled, identified and disposed of with residual hazardous materials in a site authorized by the MSDEFACC.

.7 Work adjacent to waterways shall be planned and carried out to prevent materials such as concrete, paint, primers, pickling abrasives, anti-rust solvents, degreasers, grout or any other chemical product to end up in the waterway.

.8 Contractor must take measures to prevent release of debris or other waste materials from Work into the water.

.9 Unconsolidated asphalt debris must be contained in a sealed container to prevent the migration of contaminants to the environment.

3.22 TEMPORARY SANITARY FACILITIES

.1 Contractor shall provide and maintain temporary sanitary facilities on site for workers and shall remove them upon completion of Work.

.2 Dispose of used water from temporary sanity facilities in accordance with the regulations in force and in a place authorized by the MSDEFACC. Provide disposition evidence to Departmental Representative.

3.23 MANAGEMENT OF EXCAVATION / BACKFILL

.1 Characterize the sediments from the bottom of the excavation. In the event that the level of contamination of newly exposed sediments exceeds that of excavated sediments, additional measures may be required to confine the sediments in place.

.2 Excavation materials (sediments, stones, soils, topsoil, etc.) must be segregated and stored according to their nature in anticipation of their potential reuse on the site, their volume and the importance of their contamination (e.g. generic criteria, recommendations) according to federal, provincial and municipal laws and regulations in force.

.3 Direct loading to avoid storage shall be preferred where excavated materials are to be managed off-site.

.4 All disturbed of exposed soil areas shall be limited and shall be stabilized immediately. Mulch, straw, membrane, stones or other measures to prevent erosion shall be used.

.5 Non-reused surplus excavation materials must be disposed in accordance with the regulations in force and according to their contamination level. If applicable, a written admission proof (transport coupon indicating the nature of materials and their quantity) to an authorized MELCC site shall be submitted to the Departmental Representative.

.6 Excavated material piles shall be stored on tarpaulins and covered to isolate them from wind and rain, and to prevent dispersion until their reuse or disposal off-site.

.7 Piles of fine materials must be covered to limit erosion by wind or runoff.

.8 Sediment barriers shall be installed in work areas to control stored fine materials. Each storage area shall be managed according to the type of work to be carried out and duration.

.9 Any discovery ok soil contamination (visual sign or smell) shall be reported to Departmental Representative immediately before proceeding with the work.

.10 If during the excavation work visual or olfactory cues do not match the level of anticipated contamination, Contractor shall temporarily store on Site at a designated location, perform the required analyzes and dispose according to their level of contamination. Soils shall be stored on a waterproof surface and covered to protect them from the weather.

.11 Imported soils on PCA properties must be a cropland that meets the latest standards of Montreal City and the Bureau de Normalization du Québec (BNQ).

.12 Backfill materials must be clean, free of contaminants and EIS.

3.24 DISPOSAL OF USED SNOW

.1 See section 01 74 00 – Cleaning.

.2 Ice and snow shall be removed from access roads. Snow from the clearing of work areas shall be disposed at an authorized Site by the MSDEFACC and Departmental Representative.

.3 No snow removed during snow removal may be placed in a canal in accordance with the *Historic Canal regulations.*

3.25 CLEANING

.1 Progress Cleaning

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

.2 Final Cleaning

.1 Upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning.

.2 Separate waste materials in accordance with Section 01 74 19 – Construction/Demolition Waste Management and Disposal and Section 02 56 13 – Management of Waste.

.3 Restore the Canal to its original conditions at the end of the Work (granulometry, elevation, slope).

PART 4 RESTORATION

4.1 SITE RESTORATION

.1 Site restoration must be carried out as the work progresses to be completed once the work is completed, to limit the duration of disturbances.

.2 Debris and unused materials must be removed from Site quickly.

.3 Soil revegetation shall be done as soon as possible after the completion of the earthworks, with emphasis on the use of native species. Site restoration must ensure that the environment is equivalent or better than its original condition prior to Works.

.4 Disturbed areas must be restored as quickly as possible, preferably as work progresses. If it is not possible to revegetate quickly, the soils shall be covered with a geotextile.

.5 With the exception of areas for which the repair is specifically planned as part of the work, the bed of the Canal which would have been altered to carry out the work must be restored to its initial state (grain size, elevation, slope).

.6 Repair with turf patches grass surfaces damaged by Work in accordance with PCA's requirements.

END OF SECTION

General Requirements – Quality Control
Section 01 45 00

PART 1 GENERAL

1.1 OBJECT

.1 This section provides information on the quality assurance program to be put in place by the Contractor, subcontractors and suppliers during the Work. This is not intended to replace the contractually requires a quality assurance program. It sets out the minimum quality activities to be performed by the Contractors, subcontractors and suppliers on site or at their facilities.

1.2 RESPONSIBILITIES

.1 Contractor is responsible for the application of the Quality Assurance Program.

.2 Contractor is responsible to ensure that subcontractors and suppliers implement the quality activities described in this section.

.3 Contractor, subcontractors and suppliers shall demonstrate the implementation of their quality assurance program and the conformity of their work with drawings and technical specifications during manufacture and construction.

.4 Allow Departmental Representative access to Work. If part of Work is taking place outside of the site, allow access to it during the whole length of Work.

.5 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.

.6 If contractor covers or permits to be covered Work that has been designated for special inspections, approvals or tests before such is made, must uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.7 Departmental Representative can order part of Work to be examined if Work is suspected to not be in accordance with Contract Documents.

1.3 INDEPENDENT TESTING AND INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Contractor. Cost of such services will be borne by the Contractor.

1.4 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.

.2 Co-operate to provide reasonable facilities for such access.

1.5 PROCEDURES

.1 Notify the appropriate agency and Departmental Representative, within 3 working days, of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.

.3 Provide manpower and facilities required to obtain and handle samples and materials on site. Provide enough space to store and cure test samples.

1.6 DOCUMENTS RELATED TO QUALITY

.1 Quality Manual

.1 Submit a Quality Manual to Departmental Representative for review and approval.

.2 If the Contractor has a Quality Assurance Program registered with an approved registrar, he shall submit a copy of its certificate and a copy of the table of contents instead of its entire manual.

.2 Quality Plan

.1 Submit a project specific quality plan to Departmental Representative for review and approval. See section 1.9 for more information on the content of the Quality Plan.

.2 Contractor is responsible for ensuring that subcontractors and supplier implement and respect their own quality assurance program.

.3 Inspection and Testing Plan (ITP)

.1 Before starting the Work, submit its ITP and those of subcontractors and suppliers for review and approval by the Departmental Representative. Contractor is responsible for the review and approval of the ITP of subcontractors and suppliers.

.2 Contractor is responsible for the implementation and respect of all quality activities described in its ITP.

.3 Contractor is responsible for ensuring that subcontractors and suppliers implement and respect their respective ITP.

.4 See Section 1.10 for more information on the preparation of ITP.

.4 Welding Procedures

.1 Submit its specifications of welding procedures for review and approval. The procedures require prior approval of the Departmental Representative and shall include all tests requires by the contract specifications.

.5 Work Procedures

.1 Submit its work specific method and that of subcontractors and suppliers for review and approval. These procedures shall be in accordance with contractual specifications.

1.7 QUALITY ORGANIZATION

.1 Submit details for the quality organization intended to be set in place for the project.

.2 Don’t replace key workers without notifying the Parks Canada Agency.

.3 Submit the organization chart of subcontractors and suppliers assigned to the project.

.4 All organization charts shall be added into the Contractor's Quality Plan (See section 1.9).

1.8 MANUFACTURING

.1 General

.1 Maintain on Site the quality assurance program approved by the Departmental Representative in accordance with:

.1 Contractor's Quality Manual (described in Section 1.6.1) and/or;

.2 Project specific Quality Plan described in Section 1.9 and/or;

.3 Project specific inspections and testing plan (ITP) described in Section 1.10 and/or;

.4 Construction and manufacturing activities described in subsections 1.8.1 to 1.8.9.

.2 Materials Receipt

.1 Materials provided by the Parks Canada Agency

.1 If the Parks Canada Agency provides materials or equipment for the Work, contractor must verify their condition before taking possession.

.2 Receipt of Materials purchased by the Contractor

.1 Contractor shall be able to demonstrate the conformity of all materials and equipment. These quality files shall be complete and available at Contractor, subcontractors and suppliers' facilities.

.2 Perform a receiving inspection for each material received on Site.

.3 Contractor, subcontractor and suppliers' Quality files shall provide the evidence that a receiving inspection has been performed and that conformity documents has been reviewed by the Contractor, which is materials analysis certificate and inspection reports, etc.

.4 Materials supplied by the Contractor shall be new. Identify the origin and source of materials. Refurbished materials are not acceptable.

.3 Non-Compliant Materials

.1 Identify non-compliant materials (labeled « hold » or « do not use ») and/or separate in an area / quarantine zone.

.3 Document Control

.1 Implement a document control system that controls the following activities:

.1 Ensure that only the latest revision of specifications, plans and procedures is accessible to the Contractor, subcontractor and suppliers' facilities.

.2 Identify as ''Out-of-date'' kept obsolete revisions.

.3 Provide a functional distribution system for documents, drawings, procedures, reports, etc.

.4 Catalogue and store quality records in a controlled environment.

.4 Identification and Traceability

.1 Identification

.1 Contractor is responsible for ensuring that all materials and equipment incorporated in the works are identified and traceable until the completion of Work.

.2 Traceability

.1 It shall be possible to associate materials or equipment with documents establishing their conformity and their inspection status all time.

.5 Measuring Equipment Calibration

.1 Contractor, subcontractors and suppliers shall maintain a control and recall system for calibrated measurements and tests equipment.

.2 Contractor, subcontractor and suppliers shall keep their equipment calibration certificate on Site.

.3 Contractor, subcontractor and suppliers shall store their measuring and test equipment in a safe and controlled place.

.6 Tests and Inspections

.1 Contractor, subcontractors and suppliers shall maintain an up-to-date list of its workers assigned to special processes and inspections for each discipline involved and their qualifications.

.2 Inspections and tests shall be performed in accordance with the technical specifications and the approved ITP.

.3 Contractor, subcontractors and suppliers shall implement a notification system so that the Departmental Representative can attend the tests prescribed in the technical specifications and identified in the ITP.

.7 Inspections

.1 Contractor shall be able to demonstrate inspections performed at all time during the Work.

.2 Inspections performed shall be verifiable in the Contractor's quality records. Depending on the discipline, monitor inspection levels using annotated drawings, computerized lists or databases.

.3 It shall be possible to check the inspections and testing's progress with references to generated reports at all time during Work.

.4 It shall be possible to demonstrate that all the work, inspections, tests and reports have been completed no matter the monitoring system used by the Contractor, subcontractors and suppliers.

.8 Final Acceptance

.1 After each manufacturing and construction stages, declare the complete and conforming parts, submit quality records and request for final acceptance by the Departmental Representative.

.2 Notify within a reasonable period of time the Departmental Representative for the request of the final acceptance as requested in Contract Documents.

.3 Upon receipt of the final acceptance request, Departmental Representative shall perform final inspection of materials and equipment prior issued an Inspection certificate.

.9 Quality Recordings

.1 Contractor, subcontractors and suppliers' quality records shall include, but not limited, the following documents:

.1 Inspections and Testing Plan (ITP) approved by Departmental Representative;

.2 Checklists;

.3 Relevant inspections and testing reports;

.4 Inspections and testing procedures;

.5 Materials analysis certificates;

.6 Conformity certificates;

.7 Non-conformity closing reports;

.8 Authorities with jurisdiction' statement;

.9 As built drawings;

.10 Welding procedures;

.11 Welding procedures qualifications record;

.12 List of welders and their qualification;

.13 Welding repair procedures;

.14 Approved deviations, if applicable.

1.9 QUALITY PLAN

.1 Quality Plan shall describe the organization, workers, quality assurance staffs, activities, responsibilities, resources, used documents and applicable quality procedures used to implement elements of the quality assurance program in accordance with standards and regulations applicable.

.2 Quality Plan shall include:

.1 Terms and definitions, including acronyms and abbreviations;

.2 Contractor's project team's organizational chart and quality assurance staffs with their qualifications and subcontractor and suppliers' organizational chart;

.3 Contractor, subcontractors and suppliers' scope of Work.

.4 Procedures and sections' reference list of the Contractor's Quality Manual;

.5 Documents control;

.6 Measuring equipment calibration;

.7 Quality control records;

.8 Non-compliant materials control;

.9 Quality Manual reference's audit;

.10 Correctives actions applicable;

.11 Products' identification and traceability;

.12 Equipment's handling, storage, packaging, preservation and delivery;

.13 Specific exclusions not covered by the Quality Plan.

.3 « Quality Inspection Plan », « Inspections and Testing Plan (ITP) » and « Monitoring Plan » are synonymous and refer to the same type of documents.

1.10 INSPECTION AND TESTING PLAN (ITP)

.1 « Quality Inspection Plan », « Inspections and Testing Plan (ITP) » and « Monitoring Plan » are synonymous and refer to the same type of documents.

.2 This section defines the applicable instructions to Contractor for the preparation and issuance of inspection and testing plans for manufacturing, construction/installation or pre-operational verifications.

.3 This specification is intended for those who are responsible of quality on the project once applicable ITP have been submitted according to the contractual requirements.

.4 This specification includes a standard form that shall be used by quality control parties if their own ITP does not meet the requirements of these instructions.

.5 ITP review is based on the requirements of this document.

.6 Identification

.1 ITP code, including revision number and date.

.2 Identify the client, project, region and equipment tag number.

.3 Identify contract and component, work package, work, discipline or system where ITP applies.

.4 Identify the person in charge of Quality insurance and review in Contractor, subcontractors and suppliers' facilities and on Site.

.5 Obtain signatures of the ITP verification and approval's responsible.

.6 Identify each page of the ITP (99 of 99).

.7 Elements and Work Steps

.1 This is normally based on the detailed work program. Specific details may be requested.

.8 Quality Control

.1 Identify quality review elements with their description for each step of the Work.

.9 Responsibilities

.1 Identify responsibilities position for quality control activities.

.10 Frequency

.1 Specify percentage, frequency or sampling applicable for quality control activities.

.11 Specification Reference

.1 Describe quality control activities with specific references, i.e. drawings, technical specification sections and/or applicable codes and specification as appropriate.

.12 Parameters and Characteristics

.1 Identify and list parameters and/or characteristics to be considered at quality control activities.

.13 Criteria and Tolerances

.1 Identify and list criteria and/or tolerances to be used for quality control activities acceptance.

.14 Procedures

.1 Identify and list procedures or instructions developed to control work performance or quality control activities.

.15 Inspection Equipment

.1 Describe and identify equipment used to implement the measurement, inspection or testing. Provide a calibration proof.

.16 Checklists

.1 Information identified in paragraphs 1.10.3 to 1.10.10 above shall be incorporated into a list annexed to the ITP.

.17 Forms

.1 Identify forms to be used to record quality control results and joint forms to ITP. Results registered by Contractors include an inspection and test report.

.2 If the Contractor, subcontractors of supplier's forms and quality control procedures are not enough, the Departmental Representative can incorporate any required forms or quality control procedures in completion of the quality control program.

.18 Quality Recordings

.1 Identify type of inspections and tests reports to be submitted to Departmental Representative in batch or partial of the quality records in the ITP. Include the table of contents and the submission schedule for the quality register lots at the ITP.

.2 Contractor, subcontractors and suppliers shall keep records of all documents required to provide objective evidence, demonstrating and verifying compliance with the quality assurance requirements specified in the Contract Documents.

.3 Contractor is responsible for ensuring the security of these records throughout the contract period. Submit quality records to Departmental Representative within time and quantities specified in the Contract Documents.

.4 Unless otherwise agreed, original test certificates are required. If Contractor can't provide original test certificates for reasons accepted by Departmental Representative, certificates and reports copies will be accepted if they are individually certified as being copy of the original.

.5 No modifications or transcripts other than those authorized in this paragraph will be accepted. Certified photocopies quality shall be sufficiently clear to allow scanning and photocopying; otherwise, they shall be subjected to non-acceptance. Transposing original data is not acceptable.

.6 Tests and inspection documentation shall be provided with:

.1 Project number;

.2 Applicable tag number/part number;

.3 Project designation;

.19 Traceability

.1 General

.1 Complete definitions and contract compliance are detailed below.

.2 Total Traceability

.1 Full traceability is required for items requiring inspection certificate. Other items are to demonstrate the conformity of the Contract. For items required full traceability, Contractor, subcontractors and suppliers shall maintain a traceability system ensuring that all materials used can be identified towards manufacturer's original certificates. Contractor, subcontractors and suppliers shall take the following measures:

.1 Verify materials for compliance with specified requirements on receipt with manufacturer's original certificate.

.2 Identify (by permanent marking if possible) batches of materials, specification and grade details throughout the manufacturing.

.3 Keep equipment location record.

.4 Before applying the final treatment, compile an equipment location register to incorporate to into manufacturing data records:

- Construction records shall contain materials locations and manufacturer's original certificate.
- Maintain evidence record.

.3 Compliance with the Contract

.1 Maintain a traceability system so that the verification system can confirm compliance with the Contract requirements for items requiring compliance with Contract.

.2 Verify materials upon receipt in accordance with the Contract requirements. Maintain segregation and traceability of lots of all materials issued by batch (e.g. wires, welding consumables, etc.) until use.

.20 Quality Control Monitoring Activities

.1 Before starting the Work, quality control monitoring activities shall be identified during the ITP review and approval process.

.2 Choice of monitoring activities is based on the level of monitoring selected and requirements of the quality monitoring specifications.

.21 Review

.1 ITP and its appendices shall be reviewed and accepted by the Departmental Representative and/or the Parks Canada Agency's quality control monitoring before starting the Work.

.2 Inspection and test reports and road maps shall be prepared and reviewed by the Departmental Representative's quality control monitoring on an ongoing basis as the work progresses so the quality registration lots can be assembled before provisional acceptance.

.22 Typical ITP Forms

.1 A typical ITP form example will be provided by Departmental Representative at the beginning of the Work. Contractor may provide its own ITP, but all the elements defined in this specification must be addressed.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 WORKSITE LOCATION

.1 The contractor shall provide his site facilities plan including:

- .1 Areas available for work;
- .2 Accesses;
- .3 Authorized roadways;
- .4 Spaces reserved for site and materials storage facilities and for the prefabricated construction elements;
- .5 Authorized parking areas.

1.2 LIMIT OF RESPONSIBILITIES

.1 Contractor is responsible for:

- .1 Site office;
- .2 Premises for equipment storage;
- .3 Outdoor storage for materials and equipment;
- .4 Required access roads;
- .5 Site toilets;
- .6 Water for materials compaction and dust suppressant;
- .7 Workers transportation;
- .8 Workers and equipment safety on site;
- .9 All loading/unloading work;
- .10 Maintenance of access roads (summer cleaning, gravel road grading and dust removal, snow removal);
- .11 Debris disposal;
- .12 Internet and phone links;
- .13 Customs clearance if required;
- .14 Construction fencing;
- .15 Safe access for visitors to the National Historic Site;
- .16 Lightning for night work.

1.3 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed locations and dimensions of areas to be fenced and used by Contractor and subcontractors, number of trailers to be used, access routes to fenced area and details of fencing installation.

.2 Identify areas which must be gravel coated to prevent mud deposits.

.3 Indicate required work areas or other transit areas.

.4 Clean, level and build the site facilities area.

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

.6 Remove and dispose from site all temporary material after use.

1.4 OFFICES

.1 Provide office with heating and ventilating system to maintain 22 degrees C inside temperature, lighted 750 lx, of sufficient size to accommodate site meetings and furnished with drawing laydown table. Submit office location to Departmental Representative for approval.

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.5 SERVICES

.1 Provide sufficient chemical toilets.

.2 Parks Canada does not supply any services (water, electricity or other).

1.6 PARKING ON SITE

.1 Parking is permitted on certain areas only and limited. Contractor shall supply number of places required for his need to Departmental Representative for approval.

.2 Provide and maintain suitable access roads to the site.

.3 Clean roadways where construction equipment has been used.

1.7 STORAGE AREA

.1 Storage is permitted in areas indicated in the drawings.

.2 Provide adequate and closed areas for the storage of Contractor’s equipment.

.3 Parks Canada Agency is not responsible for any theft of tools, equipment or materials.

.4 Contractor is responsible for securing its tools, equipment and materials.

1.8 CONSTRUCTION FENCING

.1 Provide construction fencing around work areas and site installation.

1.9 CONSTRUCTION SIGNAGE

.1 Construction signs are permitted on construction trailers only. Dimensions and position shall be approved by Parks Canada Agency.

1.10 LIGHTING SYSTEM FOR NIGHT WORK

.1 Provide and install lighting system for night works.

1.11 CONSTRUCTION SIGNAGE

.1 Install and maintain adequate and safe signage to indicate detours, bypasses and hazards caused by the Work.

.2 Maintain the signage in place throughout the Work according to safety codes in force and to the satisfaction of the Parks Canada Agency. If the signage is considered as inadequate or poorly maintained per Parks Canada Agency, costs to restore signage will be deducted directly from the amount owing to Contractor.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

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

.2 Keep the bike path open at all the time.

.3 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.

.4 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

.5 Protect travelling public from damage to person and property.

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

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

.8 Construct access and haul roads required.

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

.10 Dust control: adequate to ensure safe operation at all times and environment protection.

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

.12 Provide snow removal during Work.

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

1.13 PEDESTRIAN AND CYCLING PROTECTION

.1 Maintain and protect pedestrian and cycling traffic on affected tracks during construction unless otherwise specified by Departmental Representative.

1.14 CLEANING

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

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

.4 Do not store new or salvaged material in construction facilities.

.5 Provide snow removal of haul and temporary roads if required.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Temporary Barriers and Enclosures
Section 01 56 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

1.2 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 CSA Group (CSA)

.1 CSA-O121-M1978 (R2003), Douglas Fir Plywood.

1.3 ACCESS TO SITE

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

1.4 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 public.

.2 Provide a copy of the certificate of the Signal Flag Operator course for all signal flag operator.

1.5 FIRE ROUTES

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

1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

.1 For the bid, consider that paved areas (parking) and unpaved areas do not have the capacity to support construction loads (dump truck, wheel loaders, construction equipment, etc.).

.2 During the Work, protect all paved and unpaved areas. Return all paved and unpaved areas damaged by work in the same conditions it was at Contractor's cost. Traffic plans, protection and restoration methods shall be submitted to the Departmental Representative for approval before the beginning of the Work.

.3 Protect surrounding public and private areas from any damages resulting from the Work.

.4 Assume full responsibility for damages.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse in accordance with Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 FENCES

.1 Erect a temporary fence composed of a new fence, type Omega 1.8m height, attached with wire to T shaped posts installed at 2.4m center to center. Provide at least one lockable access barrier for trucks. Install fences around trees and plants to protect them from damages that may be caused by equipment or materials.

PART 3 EXECUTION

3.1 MATERIAL INSTALLATION AND REMOVAL

.1 Provide and install all temporary protection and access work required to finish the work as quickly as possible.

.2 Dismantle and dispose equipment when no longer needed.

END OF SECTION

PART 1 GENERAL

1.1 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, provide evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, promote consistency by ensuring that materials or elements of the same type come from the same manufacturer.

1.2 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in advance to prevent delay in performance of Work.

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.3 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials and lumber on flat solid supports so they do not rest directly on ground. Give a slight slope to encourage condensation water flow.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at no additional cost to the satisfaction of Departmental Representative.

.9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates

1.4 DELIVERY

.1 Pay delivery costs of products required.

.2 Unload, handle and store such products.

1.5 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.7 COORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.8 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

1.9 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.10 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.11 PROGRESS WORK PROTECTION

.1 Do not overload any part of the structure.

1.12 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, pedestrians and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 QUALIFICATION OF SURVEYOR

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

1.2 SURVEY REFERENCE POINTS

.1 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.2 Make no changes or relocations without prior written notice to Departmental Representative.

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

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

1.3 SURVEY REQUIREMENTS

.1 Establish two (2) permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill placement and landscaping features.

.4 Stake slopes and berms.

.5 Establish pipe invert elevations.

1.4 EXISTING SERVICES

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

.2 Remove abandoned service lines within [2] m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

1.5 LOCATION OF EQUIPMENT AND FIXTURES

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.

.2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.

.1 Inform Departmental Representative of impending installation and obtain approval for actual location.

.3 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

1.6 RECORDS

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

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

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

1.7 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Submit certificate signed by surveyor certifying [and noting] that elevations and locations of completed Work are conform with Contract Documents.

1.8 SUBSOIL CONDITIONS

.1 Notify Departmental Representative in writing if physical properties of soil at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After investigation, if Departmental Representative determines that physical properties of soil differ from these anticipated; instructions will be issued for changes in Work as provided in changes and change orders.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Project Document
Section 01 72 00

PART 1 GENERAL

1.1 DRAWINGS

.1 Departmental Representative will provide two (2) sets of drawings for the Project Files.

.2 Keep drawings and record any deviations from the Contract Document's requirements, changes imposed by the nature of the Site and changes requested by the Departmental Representative.

.3 Note changes in red.

.4 Record the following information:

.1 On-Site changes for dimensions and execution details.

.2 Changes made as per orders received, on-site or not.

.5 At the end of work and prior to final acceptance, transcribe corrections to the second set of drawings and return both complete set to Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Execution
Section 01 73 00

PART 1 GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00- Submittal Procedures.

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00- Submittal Procedures.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching. Take pictures and videos of the current situation before starting the work and give copy to the Parks Canada Agency on DVD or USB Driver.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning of cutting or patching means acceptance of existing conditions.

.4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.

.5 Provide protection of elements for areas which are to be exposed by uncovering work; maintain excavations free of water

1.4 EXECUTION

.1 Execute partial demolition, excavation and fill to complete Work

.2 Fit several parts together, to integrate with other Work.

.3 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.4 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools are not allowed on masonry work without prior approval.

.5 Restore work with new products in accordance with requirements of Contract Documents.

.6 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Cleaning
Section 01 74 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 56 13 – Management of Waste

1.2 REFERENCE STANDARDS

.1 Environment Quality Act (Ch. Q-2)

.2 Regulation Respecting Hazardous Materials (Q-2, r. 32)

.3 Regulation Respecting the Landfilling and Incineration or Residual Materials (Q-2, r. 19)

1.3 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Parks Canada Agency or other Contractors.

.2 Remove waste materials from site at regularly scheduled times to keep Site free from waste, residual hazardous materials, materials, substances or equipment not required for the Work and dispose them in accordance with applicable regulations. Disposal evidence in an authorized area by the Ministry of Sustainable Development, Environment, and Fight against Climate Change (MSDEFACC) shall be given to Departmental Representative.

.3 Do not burn waste materials on site.

.4 It is strictly forbidden to dispose of any material, waste, debris or residues in the Lachine Canal. If so, they shall be quickly recovered.

.5 Clear snow and ice from access roads. Snow from the cleaning of working areas shall be disposed by Contractor in an area authorized by MSDEFACC in agreement with Departmental Representative. No snow can be thrown in the Lachine Canal.

.6 Keep public roads near the Site free from materials, waste, debris or residues and clean the roads quickly if required.

.7 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.8 Provide on-site containers for waste materials and debris disposal.

.9 Provide and use marked separate bins for recycling. Refer to Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

.10 Dispose of waste materials and debris off site.

.11 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.

.12 Store volatile waste in covered metal containers and remove from premises at end of each working day.

.13 Provide adequate ventilation during use of volatile or noxious substances.

.14 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.15 Concrete Mixers Wash Water

.1 Excess concrete and cement from concrete mixers shall be poured in a sealed container. Concrete residues shall be managed with construction waste.

.2 Wash water shall not be discharged directly into water or on the ground. The wash water can be taken care of by the concrete supplier and brought back to the concrete plant for disposal. Otherwise, these waters shall be contained, sampled and treated (if required) to meet surface water quality criteria of MSDEFACC (Aquatic Life Protection) for suspended solids, pH and C_{10}-C_{50}, before being released into environment. Contractor shall obtain permission from Parks Canada Agency or its Designated Representative before proceeding with any release to the environment.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 56 13 – Management of Waste

1.2 WASTE MANAGEMENT GOALS

.1 Prior to start the Work, meet with Departmental Representative to review Parks Canada Agency's waste management objectives and Contractor's proposed waste reduction plan for waste construction, renovation and demolition (CRD) generated by the Project.

.2 Parks Canada Agency's objective for waste management is to minimize flow of construction/demolition waste to landfills. Prior to end the Work, provide documentation certifying that comprehensive measures and procedures for waste management, recycling and reuse of recyclable materials have been implemented.

.3 Minimize the amount of non-hazardous solid waste generated by the Work; maximize source reduction, reuse and recycling of solid waste generated by CRD activities.

.4 Protect environment and prevent damage related to environment pollution.

1.3 REFERENCE

.1 Definitions

.1 Approved/Authorized Recycling Facility: Approved provincial recycler, or other material recyclers approved by the Departmental Representative.

.2 Class III Non-Hazardous Materials: Construction, Renovation and Demolition Waste.

.3 Construction, Renovation and/or Demolition Waste (CRD): Class III non-hazardous solid waste generated by construction, renovation and/or demolition activities.

.4 Discharge – inert waste: Bituminous and concrete materials.

.5 Source Waste Separation Program (SWSP): On-going implementation and coordination of activities to ensure that designated waste are sorted into pre-defines categories and routed for recycling and reuse, maximizing value and potential for reducing disposal costs.

.6 Recyclability: Characteristics of a product that can be recovered at the end of its life cycle and transformed into a new product for reuse.

.7 Recycle: Process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.8 Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.9 Reuse: Repeated use of a product/material in its original form in a different or similar way. Reuse include:

.1 The recovery of products/materials that can be reused generated by a modernization before their demolition, for resale, reuse or storage for later use.

.2 Return of products/materials that can be reused, such as pallets or unused products/materials to vendors.

.10 Recovery: Removal of load-bearing and non-load bearing components and materials during deconstruction or disassembly of industrial, commercial or institutional structures for reuse or recycling.

.11 Sorted waste: Type classified waste.

.12 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

.13 Waste Recovery Report: Detailed final results report, which quantifies cumulative weights and percentages of waste reused, recycled and landfilled throughout the Work. Measure achievement of the Waste Reduction Plan (WRP) objectives and note lessons learned.

.14 Waste Management Coordinator (WMC): Contractor's supervisor for waste management activities and coordinator for reporting requirements, documents and samples to be submitted.

.15 Waste Reduction Plan (WRP): Written document considering the opportunities for reduction, reuse and recycling of waste generated by the Project. Describe valuation goals, implementation and reporting procedures, expected results and responsibilities. Waste reduction plan is based on information acquired from the waste audit.

.2 Reference

.1 Environment Quality Act (LRQ, ch. Q-2)

.2 Regulation respecting hazardous materials (Q-2, r. 32)

.3 Regulation respecting the landfilling and incineration of residual materials (Q-2, r. 19)

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit, at intervals set by the Departmental Representative, the following:

.1 Receipts, weight tickets, waybills and/or waste disposal receipts produced as part of the Work (hazardous residual materials, waste, recyclables, construction debris, etc.) indicating quantities and reused, recycled or disposed material types.

1.5 FACILITIES USE

.1 Minimize disruption of normal use of the Site.

.2 Maintain safety measures established for the facilities. Implement temporary safety measures approved by the Departmental Representative.

1.6 WASTE TREATMENT SITE

.1 Contractor is responsible to provide resources for waste recovery and suppliers. Recovered waste materials shall be brought to approved and/or licensed recycling sites or equipment recyclers.

1.7 MATERIALS STORAGE, HANDLING AND PROTECTION

.1 Store waste materials recovered for reuse or recycling at zones indicated by the Departmental Representative.

.2 Unless otherwise indicated, waste materials to be disposed shall become Contractor's property.

.3 Protect, stockpile, store and catalogue recovered items.

.4 Hazardous Residual Materials (HRM) shall be sorted and managed in accordance with regulations in force, including Regulation Respecting Hazardous Material (Q-2, r.32).

.5 Separate non-recoverable from recoverable items. Deliver non-recoverable items to authorized disposal facility.

.6 Protect left in place structural members and recovered waste materials from movements and damages.

.7 Support structures affected by the Work. If the building safety is compromised, stop the Work and notify Departmental Representative immediately.

.8 Protect drainage work from surface water to prevent damage or obstruction; protect electrical and mechanical facilities.

.9 Provide on-site facilities and containers to collect and store reusable and recyclable materials.

.10 Sort and store waste materials generated by the Project in designated areas.

.11 Prevent contamination of waste materials destined for recovery and recycling in accordance with the acceptance conditions of designated treatment facilities.

.1 It is recommended to sort waste materials at source.

.2 Dispose of mixed waste materials collected to a treatment site outside worksite for sorting.

.3 Obtain waybills, receipts and/or weight tickets for sorted and removed from site waste materials and submit them to the Departmental Representative.

.4 On-site reused materials are valued and shall be included in any reports.

1.8 WASTE DISPOSAL

.1 Do not bury rubbish or waste.

.2 Do not dispose of materials, waste, hazardous residual materials (HRM), debris or residues in waterway or storm/sanitary sewer.

.3 Keep a construction waste register indicating the following:

.1 Bins size and quantities.

.2 Waste type of each bin.

.3 Generated waste's total tonnage.

.4 Reuse/recycled waste's total tonnage.

.5 Reuse/recycled waste's destination.

.4 Collect waste from site as work progresses.

.5 Collect HRM produced. HRM shall be sorted and managed in accordance with regulation in force, including the Regulation Respecting Hazardous Materials (Q-2, r. 32).

.6 Dispose of HRM in a site authorized by the MSDEFACC. Provide disposition evidence to Departmental Representative.

.7 Collect residual materials produced during the Work (waste, recyclable materials, construction debris, etc.) Sort and manage residual material according to the regulation in force.

.8 Dispose of residual materials in a site authorized by MSDEFACC. Provide disposition evidence to Departmental Representative.

1.9 WORK SCHEDULE

.1 Co-ordinate waste management with other activities to ensure an orderly work progress.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Closeout Procedures
Section 01 77 00

PART 1 GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures.

.2 Departmental Representative's Inspection:

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

.2 Contractor to correct Work as directed.

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

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

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested and fully operational.

.4 Operation of systems: demonstrated to Parks Canada Agency's personnel.

.5 Work: complete and ready for final inspection.

.4 Final Inspection

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

.2 When Work incomplete according to Parks Canada Agency and Departmental Representative, complete outstanding items and request re-inspection.

1.2 FINAL CLEANING

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials in accordance with Section 01 74 19 – Construction / Demolition Waste Management and Disposal

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

General Requirements – Closeout Submittals
Section 01 78 00

PART 1 GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

.1 Two (2) weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, one (1) final copy of operating and maintenance manuals in English and French.

.2 Provide evidence, if requested, for type, source and quality of products supplied.

.3 Drawings, marked-up in red, of all disciplines, with all the modifications carried out compared to the original drawings. The Contractor must affix the caption "Certified as built" with the date of the survey and the Contractor's signature.

1.2 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

.9 Provide CAD files in DWG format on CD.

1.3 CONTENTS – PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;

.1 Date of submission.

.2 Names, addresses and telephone numbers of Consultant and Contractor with name of responsible parties.

.3 Schedule of products and systems indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data.

1.4 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system include description of unit or system, and component parts.

.1 Give function, normal operation characteristics and limiting conditions.

.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications

.3 Provide cabling schematics of installed material.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.

.1 Include regulation, control, stopping, shut-down, and emergency instructions.

.2 Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.12 Include test reports.

1.5 WARRANTIES AND BONDS

.1 Develop warranty management plan to contain information relevant to Warranties.

.2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.

.3 Warranty management plan to include required actions and documents to assure that Parks Canada Agency receives warranties to which it is entitled.

.4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.5 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.6 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.

.2 Provide list for each warranted equipment, item, and feature of construction or system indicating.

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers and suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for warranted equipment.

.7 Respond in timely manner to oral or written notification of required construction warranty repair work.

.8 Written verification to follow oral instructions.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 General requirements relating to commissioning of project's components and systems.

.2 Acronyms:

.1 AFD - Alternate Forms of Delivery, service provider.

.2 MM - Management Manual.

.3 Cx - Commissioning.

.4 EMCS - Energy Monitoring and Control Systems.

.5 O&M - Operation and Maintenance.

.6 PI - Product Information.

.7 PV - Performance Verification.

.8 TAB - Testing, Adjusting and Balancing.

1.2 GENERAL

.1 Commissioning is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Commissioning is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:

.1 Verify installed equipment and systems operate in accordance with Contract Documents and design criteria and final design.

.2 Ensure appropriate documentation is compiled into the MM.

.3 Effectively train O&M staff.

.2 Contractor assists in Commissioning process, operating equipment and systems, troubleshooting and adjusting as required.

.1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.

.2 During these checks, adjustments to be made to enhance performance to meet user requirements.

.3 Design Criteria: as per client's requirements or determined by designer. To meet Project functional and operational requirements.

1.3 COMMISSIONING OVERVIEW

.1 Commissioning to be a line item of Contractor's cost breakdown.

.2 Commissioning activities supplement field quality and testing procedures described in relevant technical sections.

.3 Commissioning is closely associated with the activities carried out during the project. It identifies issues in Planning and Design stages which are addressed during Construction and Commissioning stages to ensure the project to meet functional and operational requirements. Commissioning activities includes transfer of critical knowledge to facility operational personnel.

.4 Departmental Representative will issue Interim Acceptance Certificate when:

.1 Completed Commissioning documentation has been received, reviewed for suitability and approved by Departmental Representative.

.2 Equipment, components and systems have been commissioned.

.3 O&M training has been completed.

1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS

.1 Should equipment, system components, and associated controls be incorrectly installed or malfunction during Commissioning, correct deficiencies, re-verify equipment and components within the unfunctional system, including related systems as deemed required by Departmental Representative, to ensure effective performance.

.2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor.

1.5 PRE-COMMISSIONING REVIEW

.1 Before start of Commissioning:

.1 Have completed Commissioning Plan up-to-date.

.2 Ensure installation of related components, equipment, sub-systems, systems is complete.

.3 Fully understand Commissioning requirements and procedures.

.4 Have Commissioning documentation shelf-ready.

.5 Understand completely design criteria and intent and special features.

.6 Submit complete start-up documentation to Departmental Representative.

.7 Have Commissioning schedules up-to-date.

.8 Ensure systems have been cleaned thoroughly.

.9 Complete TAB procedures on systems; submit TAB reports to Departmental Representative for review and approval.

.10 Ensure "As-Built" system schematics are available.

.2 Inform Departmental Representative in writing of discrepancies and deficiencies on finished works.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals: in accordance with Section 01 33 00- Submittal Procedures.

.1 Submit no later than four (4) weeks after award of Contract:

.1 Name of Contractor's Commissioning agent.

.2 Draft Commissioning documentation.

.3 Preliminary Commissioning schedule.

.2 Request in writing to Departmental Representative for changes to submittals and obtain written approval at least [8] weeks prior to start Commissioning.

.3 Submit proposed Commissioning procedures to Departmental Representative where not specified and obtain written approval at least [8] weeks prior to start Commissioning.

.4 Provide additional documentation relating to Commissioning process required by Departmental Representative.

.2 Provide completed and approved Commissioning documentation to Departmental Representative.

1.7 COMMISSIONING SCHEDULE

.1 Provide detailed Commissioning schedule as part of construction schedule in accordance with Section 01 32 16.19- Construction Progress Schedule - Bar Chart (GANTT).

.2 Provide adequate time for Commissioning activities prescribed in technical sections and commissioning sections including:

.1 Approval of Commissioning reports.

.2 Verification of reported results.

.3 Repairs, retesting, re-commissioning, re-verification.

.4 Training.

1.8 STARTING AND TESTING

.1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.9 WITNESSING OF STARTING AND TESTING

.1 Provide fourteen (14) days' notice prior to start-up and testing.

.2 Departmental Representative to witness of start-up and testing.

1.10 PROCEDURES

.1 Verify that equipment and systems are complete, clean, and operating in normal and safe manner prior to conducting start-up, testing and Commissioning.

.2 Conduct start-up and testing in following distinct phases:

.1 Included in delivery and installation:

.1 Verification of conformity to specification, approved shop drawings and completion of PI report forms.

.2 Visual inspection of quality of installation.

.2 Start-up: follow accepted start-up procedures.

.3 Operational testing: document equipment performance.

.4 Performance verification (PV): if applicable, include repetition of tests after correcting deficiencies.

.5 Post-substantial performance verification: to include fine-tuning.

.3 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.

.4 Document required tests on approved PV forms.

1.11 START-UP DOCUMENTATION

.1 Assemble start-up documentation and submit to Departmental Representative for approval before start commissioning.

.2 Start-up documentation to include:

.1 Factory and on-site test certificates for specified equipment.

.2 Pre-start-up inspection reports.

.3 Signed installation/start-up check lists.

.4 Start-up reports,

.5 Step-by-step description of complete start-up procedures, to permit Departmental Representative to resume start-up at any time.

1.12 TEST RESULTS

.1 If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved.

.2 Provide manpower and materials and assume costs for re-commissioning.

1.13 START OF COMMISSIONING

.1 Notify Departmental Representative at least [21] days prior to start of Commissioning.

.2 Start Commissioning only after elements of facility affecting start-up and performance verification of systems have been completed.

1.14 INSTRUMENTS/EQUIPMENT

.1 Provide a complete list of instruments proposed to be used.

.2 Provide listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.

.3 Provide the following equipment as required:

.1 2-way radios.

.2 Ladders.

.3 Equipment as required to complete work

1.15 COMMISSIONING PERFORMANCE VERIFICATION

.1 Carry out Commissioning:

.1 Under actual operating conditions, over entire operating range, in all modes.

.2 On independent systems and interacting systems.

.2 Commissioning procedures to be repeatable and reported results are to be verifiable.

.3 Follow equipment manufacturer's operating instructions.

.4 EMCS trending to be available as supporting documentation for performance verification.

1.16 WITNESSING COMMISSIONING

.1 Departmental Representative to witness activities and verify results.

1.17 SUNDRY CHECKS AND ADJUSTMENTS

.1 Make adjustments and changes which become apparent as Commissioning proceeds.

.2 Perform static and operational checks as applicable and as required.

1.18 DEFICIENCIES, FAULTS, DEFECTS

.1 Correct deficiencies found during start-up and Commissioning to satisfaction of Departmental Representative.

.2 Report problems, faults or defects affecting Commissioning to Departmental Representative in writing. Stop Commissioning until problems are rectified. Continue after written approval from Departmental Representative.

1.19 COMPLETION OF COMMISSIONING

.1 Upon completion of Commissioning leave systems in normal operating mode.

.2 Commissioning to be considered complete when contract Commissioning deliverables have been submitted and accepted by Departmental Representative.

1.20 ACTIVITIES UPON COMPLETION OF COMMISSIONING

.1 When changes are made to baseline components or system settings established during Commissioning process, provide updated Cx form for affected item.

1.21 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS

.1 Supply, deliver, and document maintenance materials, spare parts and special tools as specified in Contract Documents.

1.22 OCCUPATION

.1 Cooperate with Departmental Representative during stages of acceptance and occupancy of facility.

1.23 PERFORMANCE VERIFICATION TOLERANCES

.1 Application tolerances:

.1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for certain components, equipment and systems, to be within +/- [10] % of specified values.

.2 Instrument accuracy tolerances:

.1 To be of higher order of magnitude than equipment or system being tested.

.3 Measurement tolerances during verification:

.4 Unless otherwise specified, actual values to be within +/- [2] % of recorded values

1.24 OWNER'S PERFORMANCE TESTING

.1 Performances testing of equipment or system by Departmental Representative will not release Contractor from compliance with specified start-up and testing procedures.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Structure Demolition
Section 02 41 16

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of Work.

1.2 REFERENCE STANDARDS

.1 CSA International: CSA S350-FM1980 (R2003), Code of Practice for Safety in Demolition of Structures.

.2 U.S. Environmental Protection Agency (EPA)/Office of Water: EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 The Contractor shall submit to Departmental Representative for review and acceptance method statements of the proposed dismantling and demolition works, lists of equipment and materials to be used.

.2 The Contractor shall submit to Departmental Representative with its methodology the list of necessary measures to prevent debris from entering the waterbody.

.3 Submit to Departmental Representative, shoring and bracing drawings as required for approval and review at least seven (7) days before starting the work. Drawings shall be sealed and signed by an engineer recognized and licensed to practice in Canada, in the province of Quebec.

.4 Submit to Departmental Representative, demolition procedures, which shall meet the requirements for environmental protection, at least seven (7) days before starting the Work. These procedures shall include materials' method and location.

PART 2 PRODUCTS

2.1 EQUIPMENT

.1 Contractor shall provide equipment in good condition and in sufficient number to remove the concrete within the deadline specified in Contract Documents.

.2 All equipment must be in perfect working condition and suitable for the required work.

.3 Hydraulic hammer:

.1 All hydraulic hammers must be approved by Departmental Representative. Approval will be made according to the impact energy per blow that equipment can transmit. Provide data sheets to Departmental Representative before starting the work.

.2 At the time of demolition work, the Departmental Representative may ask at any time to reduce the capacity of authorized demolition equipment, when he judges that the demolition work is causing damage to the reinforcements, concrete, or any other material to keep.

.4 Saw cutting:

.1 Saw cutting method must be appropriate to perform the work in accordance with the specifications and drawings within the prescribed time. All planned equipment must be able to obtain the requested profiles.

.5 Drilling equipment:

.1 Drilling equipment must be rotary percussive, or diamond-rim type capable of drilling, in concrete and rock, hole diameters and depths as indicated on the drawings.

.6 Air compressor:

.1 Air compressors must be capable of producing an air flow volume and pressure sufficient to discharge, out of the hole, concrete or rock debris produced by drilling operations.

.7 Water compressor:

.1 Water compressors must be capable of producing a water flow rate that is at least equal to the pressure required to perform hydro-demolition work.

.8 Other methods:

.1 Contractor may propose any other method of demolition to respect the desired profile with the tolerances indicated in the drawings. In all cases, the Contractor must excavate the minimum required on drawings.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Inspect Site with Departmental Representative and verify location and extent of items to be removed, disposed of, salvaged and those to remain in place.

.2 Identify and protect utility lines and ensure good condition for the lines in operation.

.3 Notify utility companies and relevant departments and obtain necessary approvals from them before starting the demolition.

.4 If required, disconnect, shut off or re-route existing service lines located on Site, which interfere with the performance of the work, in accordance with the requirements of authorities with jurisdiction. Identify the location of these pipelines and those previously left in the field and indicate (on horizontal and vertical plans) on the as-built drawings. Support, counteract and maintain in place the pipes and conduits encountered.

.1 Notify Departmental Representative and applicable utility immediately of any damage to service line to be retained.

.2 Immediately notify Departmental Representative of discovery of any unregistered utility lines and wait for written instructions to proceed.

.5 The contractor shall, at his expense, repair any damage caused by his work and restore the integrity of the modified work.

.6 Demolition work must be carried out during the day, between 8:00 am and 4:00 pm. Unless authorized by the Departmental representative, no demolition work should be done on weekends.

3.2 PREPARATION

.1 Protection of in-place conditions:

.1 Take necessary measures to prevent movement, settlement or other damage to existing structures. Provide shoring and structures bracing as required.

.2 Minimize amount of dust and noise produced by the work as well as the inconvenience to site users.

.3 Locate and protect electrical equipment, systems and installations, and service lines.

.4 Provide dust screens, tarpaulins, railings, support elements and other required protective devices.

.5 Perform work in accordance with health and safety requirements.

.6 Clean the work area daily.

.7 Unless otherwise indicated, the areas to be demolished must be delimited by a saw cut 25mm deep perpendicular to the surface on all sides.

.2 Demolition/Removal Work

.1 Remove elements as indicated in drawings.

3.3 CLEANING

.1 Cleaning during work: Carry out cleaning work so that the Site is clean at the end of each working day.

.2 Final cleaning: Dispose of materials/equipment, tools, waste off site to the satisfaction of the Departmental Representative.

.3 Refer to drawings for materials to be recovered for reuse or recycling.

.4 Waste Management: separate waste materials for reuse or recycling.

.5 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 35 29.06 – Health and Safety

.3 Section 01 35 43 – Environmental Protection

.4 Section 01 74 00 – Cleaning

.5 Section 01 74 19 – Construction/Demolition Waste Management and Disposal

1.2 REFERENCE STANDARDS

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

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

.1 Safety Data Sheets (SDS).

.3 National Fire Code of Canada, 2010.

.4 Transportation of Dangerous Goods Act (TDGA), [1999] c. 34.

.5 Transportation of Dangerous Goods Regulations (TDGR), T-19.01-SOR/2003-400.

.6 Ozone-Depleting Substances Regulations, SOR/99-07.

.7 Environmental Code of Practice on Halons, July 1996.

.8 Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems, March 1996.

.9 Environment Quality Act (LRQ, c. Q-2)

.10 Regulation Respecting Hazardous Materials (Q-2, r.23).

1.3 DEFINITIONS

.1 Toxic: substance is considered toxic if it is listed on Toxic Substances List found in Schedule 1 of CEPA.

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

.3 PCB: includes chlorobiphenyls referred to in Column I of item 1 of the List of Toxic Substances in Schedule I of Canadian Environmental Protection Act.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06 – Health and Safety.

.2 Submit photocopy of shipping documents to Departmental Representative when shipping toxic wastes off site.

1.5 DELIVERY, STORAGE, AND HANDLING

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

.2 Store and handle flammable and combustible wastes in accordance with current National Fire Code of Canada requirements.

.3 Coordinate storage of toxic wastes with Departmental Representative and follow internal requirements for labelling and storage of wastes.

.4 Observe smoking regulations. Smoking is prohibited in area where toxic wastes are stored, used, or handled.

.5 Only certified persons who have successfully completed Environment Canada Environmental Awareness Course for Environmentally Safe Handling of Refrigerants are permitted to work on refrigeration and air conditioning systems.

.6 Report spills or accidents involving toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities. Take reasonable measures to contain the release while ensuring health and safety is protected.

.7 Transport toxic wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations

.8 Use authorized/licensed carrier to transport toxic waste.

.9 Coordinate transportation and disposal of toxic wastes and Hazardous Materials with Departmental Representative.

.10 Notify appropriate regulatory authorities and obtain required permits and approvals prior to exporting toxic waste.

.11 Dispose of toxic wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.

.12 Ensure toxic waste are shipped to authorized/licensed treatment or disposal facility and that the liability insurance requirements are met. Submit disposal evidence to Departmental Representative.

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

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Lead-Base Paint Abatment – Minimum Precautions
Section 02 83 10

PART 1 GENERAL

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following Work:

.1 Removal of lead-containing coatings using a power tool on handrails and gains.

1.2 RELATED REQUIREMENTS

.1 Section 09 91 13.01 – Exterior Re-Painting .

1.3 REFERENCE STANDARDS

.1 Department of Justice Canada

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

.2 Health Canada

.1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).

.3 Human Resources and Social Development Canada (HRSDC)

.1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.

.4 Transport Canada (TC)

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

.5 U.S. Environmental Protection Agency (EPA)

.1 EPA 747-R-95-007, Sampling House Dust for Lead.

.6 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).

.7 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances

.1 Lead in Construction Regulation - 29 CFR 1926.62.

.8 Underwriters' Laboratories of Canada (ULC)

1.4 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 representative.

.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 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 metre 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: Consultant 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.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.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 of Environmental Liability Insurance.

.4 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.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, 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 29.06 - Health and Safety Requirements.

.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.

.2 Eating, drinking, chewing, and smoking are not permitted in work area.

.3 Ensure workers wash hands and face when leaving work area.

.4 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 Separate waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.3 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 6 ml bags or leak proof drums. Label containers with appropriate warning labels.

.4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Notify Departmental Representative of lead 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.

1.9 SCHEDULING

.1 Not later than two days before beginning Work on this Project notify following in writing:

.1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.

.2 Provincial Ministry of Labour.

.3 Disposal Authority.

.2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.

.3 Provide Departmental Representative copy of notifications prior to start of Work.

1.10 PERSONNEL TRAINING

.1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.

.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 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.

.3 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.

.4 Lead waste containers: metal type acceptable to dump 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.

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 items to be salvaged or reused.

.1 Protect and wrap items and transport and store in area specified by Departmental Representative.

.2 Shop Work:

.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 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 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 cables and equipment.

.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 ABATMENT

.1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal equipped with HEPA filters; or removal with using power tools non-powered hand tool, other than manual scraping and sanding.

.2 Remove lead based 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. Wash containers thoroughly pending removal to outside. Ensure containers are removed 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 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 surface sampling to be conducted as follows:

.1 After work area has passed a visual inspection for cleanliness approved and accepted by Departmental Representative. Apply coat of lock-down agent to surfaces within enclosure, and appropriate setting 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 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.

.3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

.1 Following cleaning and when lead wipe surfaces sampling are 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 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.

END OF SECTION

Concrete Forming and Accessories
Section 03 10 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 03 20 00 – Concrete Reinforcing

.2 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

.1 Unless otherwise indicated, refer to latest edition and amendments of following standards prevailing at effective date of Contract.

.2 Canadian Standards Association (CSA)

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA O86S1 Supplement No. 1 to CAN/CSA O86, Engineering Design in Wood.

.3 CSA O121, Douglas Fir Plywood.

.4 CSA O151, Canadian Softwood Plywood.

.5 CSA O153, Poplar Plywood.

.6 CAN/CSA O325.0, Construction Sheathing.

.7 CSA O437 Series, Standards for OSB and Waferboard.

.8 CSA S269.1, Falsework and Formwork.

.9 CAN/CSA S269.3, Concrete Formwork.

.3 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit shop drawings for formwork and falsework.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

.3 Submit WHMIS Material Safety Data Sheets (MSDS).

.4 Coordinate submittal requirements and provide submittals.

.5 Shop drawings shall indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners and locations of temporary embedded parts. Comply with CSA S269.1 for falsework drawings and with CAN/CSA-S269.3 for formwork drawings.

.6 Shop drawings shall indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.7 Indicate sequence of erection and removal of formwork/falsework as directed by the Departmental Representative.

.8 When slip forming is used, submit details of equipment and procedures for review by the Departmental Representative.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste management and disposal

.1 Store and manage hazardous materials in accordance with Section 01 74 19 – Construction / Demolition Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Divert wood materials to a recycling or reuse facility as approved by the Departmental Representative.

.4 Divert plastic materials to a recycling or reuse facility as approved by the Departmental Representative.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Formwork materials

.1 For concrete without special architectural features, use wood or wood product formwork materials conform to CAN/CSA-O86. Use of steel concrete forming is also permitted.

.2 For concrete with special architectural features, use formwork materials conform to CSA-A23.1/A23.2.

.3 Rigid insulation board: conform to CAN/ULC-S701.

.2 Pan forms: removable, permanent, steel, reinforced plastic, as indicated.

.3 Tubular column forms: round steel, spirally wound laminated fibre forms, internally treated with release material.

.4 Form ties

.1 For concrete without special architectural features, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 For architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.5 Form liner

.1 Plywood: Douglas Fir conform to CSA O121, Canadian Softwood Plywood conform to CSA O151, Poplar conform to CSA O153.

.2 Waferboard: conform to CAN/CSA-O325.0.

.6 Form release agent: non-toxic, low VOC.

.7 Form stripping agent: colourless mineral oil, non-toxic, low VOC, free of kerosene.

.8 Falsework materials: conform to CSA-S269.1.

.9 Sealant: as recommended by the Departmental Representative or in plan notes.

PART 3 EXECUTION

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain the Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1.

.5 Do not place shores and mud sills on frozen ground.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.8 Align form joints and make watertight.

.1 Keep form joints to minimum.

.9 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

.10 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.11 Construct forms for architectural concrete, and place ties as indicated.

.1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.12 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.13 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

.14 Before placing concrete inform Departmental Representative in writing that falsework was inspected by a licensed engineer in Quebec, Canada and complies with the design requirements. Report must be signed and include date and time of inspection.

.15 When slip forming is used, submit details as per action and informational submittals in section 1.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

.1 3 days for walls and sides of beams.

.2 3 days for columns.

.3 28 days for beams, slabs, decks and other structural members, or 7 days when replaced immediately with adequate shoring to standard specified for falsework.

.4 3 days for footings and abutments.

.2 Remove formwork when concrete has reached 80% of its design strength or minimum period noted above, whichever comes first, and replace immediately with adequate reshoring.

.3 Provide necessary reshoring of members where early removal of forms may be required or where members may be subjected to additional loads during construction as required.

.4 Space reshoring in each principal direction at not more than 3000 mm apart.

.5 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 03 10 00 – Concrete Forming and Accessories

.3 Section 03 30 00 – Cast-in-Place Concrete

1.2 REFERENCES

.1 Unless otherwise indicated, refer to latest edition and amendments of following standards prevailing at effective date of Contract.

.2 American Concrete Institute (ACI)

.3 ASTM International

.1 ASTM A82/A82M, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A143/A143M, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.3 ASTM A185/A185M, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.4 CSA International

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA A23.3, Design of Concrete Structures.

.3 CSA G30.18, Carbon Steel Bars for Concrete Reinforcement.

.4 CSA G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CAN/CSA-G164, Hot dip galvanizing of irregularly shaped articles.

.6 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.

.5 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC, Reinforcing Steel Manual of Standard Practice.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare reinforcement drawings in accordance with Manual of Standard Practice.

.3 Shop Drawings

.1 Submit drawings stamped and signed by professional engineer registered or licensed in province of Quebec, Canada.

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Reference to the bar bending schedules.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

.2 Detail lap lengths and bar development lengths to CAN/CSA A23.3, unless otherwise indicated.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.2 Storage and Handling Requirements

.1 Ship the reinforcements to the site in separate lots labeled so that they are easily identified on the order forms.

.2 Take all precautions not to deform or soil the reinforcements during their transport, then their handling and their storage on the site.

.3 Store materials off ground, in clean areas and in accordance with manufacturer's recommendations.

.4 Replace defective or damaged materials with new materials.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

.2 Reinforcing steel: high-bond billet steel, grade 400 or 500, deformed bars to CSA-G30.18, unless indicated otherwise.

.3 Reinforcing steel: weldable low alloy steel deformed bars to CSA G30.18.

.4 Steel welded wire Reinforcement: to ASTM A185/A185M.

.1 Provide in flat sheets only.

.5 Welded steel wire fabric: to ASTM A82/A82M.

.1 Provide in flat sheets only.

.6 Galvanizing of non-prestressed reinforcement: minimum zinc coating 610 g/m2 conform to CAN/CSA-G164. Provide only if indicated in drawings.

.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.

.2 If chromate treatment carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.

.1 Temperature of solution minimum 32 degrees and galvanized steels immersed for minimum 20 seconds.

.3 If galvanized steels at ambient temperature, add sulfuric acid as bonding agent at concentration of 0.5% to 1%.

.1 No restriction applies to temperature of solution.

.4 Chromate solution sold for this purpose may replace solution described above, provided if of equivalent effectiveness.

.1 Provide product description as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.7 Chairs, bolsters, bar supports and spacers: to CSA-A23.1/A23.2.

.8 Mechanical splices: subject to approval of Departmental Representative.

.9 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 The fabrication of the reinforcements must not begin until the drawings and order forms for these reinforcements have been examined by the Departmental Representative.

.2 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 or Reinforcing Steel Manual of Standard Practice from Reinforcing Steel Institute of Canada (RSIC).

.3 The overlap and reinforcement seal lengths must comply with the prescriptions of standard CAN-CSA-A23.3; Unless otherwise indicated on the drawings, the overlap lengths will be the maximum lengths determined by chapter 12 of CAN-CSA-A23.3.

.4 The overall dimensions of brackets and ties must comply with the minimum concrete cover thicknesses, in accordance with section 6.6.6 of standard CAN / CSA A23.1.

.5 Obtain Departmental Representative’s written approval for locations of reinforcement splices other than those shown on placing drawings.

.6 Upon approval by Departmental Representative, weld reinforcement in accordance with CSA W186.

.7 Ship bundles of bar reinforcement clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis as well as reinforcement galvanization reports (if required), minimum 2 weeks prior to beginning work.

PART 3 EXECUTION

3.1 PREPARATION

.1 Galvanizing to include chromate treatment.

.1 Duration of treatment to be 1 hour per 25 mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.3 Ensure cover of reinforcement is maintained during concrete pour.

3.4 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

3.5 CLEANING

.1 Progress Cleaning: carry out cleaning work.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion, remove surplus materials, rubbish, tools and equipment from Work site.

.3 Waste Management: separate waste materials for reuse or recycling.

END OF SECTION

Cast-In-Place Concrete
Section 03 30 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal procedures

.2 Section 01 45 00 – Quality Control

.3 Section 03 10 00 – Concrete Forming and Accessories

.4 Section 03 20 00 – Concrete Reinforcing

1.2 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C260/C260M, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C1017/C1017M, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.2 CSA International

.1 CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000, Cementations Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 DEFINITIONS

.1 Portland cement: hydraulic cement, blended hydraulic cement (XXb – b denotes blended) and Portland-limestone cement.

.1 Type GU, GUb and GUL – General use cement.

.2 Type MS and MSb – Moderate sulphate-resistant cement.

.3 Type MH, MHb and MHL – Moderate heat of hydration cement.

.4 Type HE, HEb and HEL – High early-strength cement.

.5 Type LH, LHb and LHL – Low heat of hydration cement.

.6 Type HS and HSb – High sulphate-resistant cement

.2 Fly ash:

.1 Type F – with CaO content less than 8 %.

.2 Type CI – with CaO content ranging from 15 % to 20%.

.3 Type CH – with CaO greater than 20%.

.4 Type S – Ground, granulated blast-furnace slag.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit the documents and samples required in accordance with Section 01 33 00 – Submittal Procedures.

.2 At least four (4) weeks prior to the work, submit the Departmental Representative samples of the following materials proposed for the work:

.1 five (5) liters of curing compound;

.2 Three (3) kg of each type of cement addition;

.3 Ten (10) kg of each type of hydraulic cement;

.4 Five (5) kg of each adjuvant.

.5 10 kg of each type of fine aggregate and coarse aggregate.

.3 Submit results and test reports to the Departmental Representative for review, and in case of any deviation or any deviation from the formula or dosing parameters prescribed for the concrete mixture, do not continue work without prior written permission

.4 Concrete batches: submit accurate records of concrete batch set up the date and location of each batch, concrete quality, air temperature and specimens taken as directed by Article 3.4 - Field Quality Control.

.5 Concrete Transfer time: Submit to the Departmental Representative, for consideration, any deviation greater than the allowable maximum of 105 minutes for the delivery of concrete to the construction site and pouring of the batch.

.6 Provide two copies of WHMIS Safety Data Sheets (SDS).

1.5 QUALITY ASSURANCE

.1 Submit to the Departmental Representative, minimum four (4) weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Provide test data, compliance certificates, technical data sheets, and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture that meet specified requirements. The conformity of each mixture with the requirements of this specification shall be demonstrated by laboratory tests.

.2 Minimum four (4) weeks prior to starting concrete work, submit proposed quality control procedures for review by the Departmental Representative on following items:

.1 Erection of temporary formwork

.2 Hot weather concrete.

.3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Execution of joints.

.3 Quality Control Plan: submit a written report to the Departmental Representative, certifying compliance of cast in place concrete to the performance requirements set out in Article 2.2 – Performance Criteria.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Concrete hauling time: deliver to site of Work and discharged within 105 minutes maximum after batching.

.1 Where applicable, any changes to the maximum transport time must be accepted in writing by the Departmental Representative and the producer of concrete, as indicated in CSA A23.1 / A23.2.

.2 Deviations must be submitted to the Departmental Representative for review.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.3 All concrete must be supplied ready to use ("ready mix") by the same supplier.

.4 The ready-mixed concrete supplier is solely responsible for its dosage and must himself, and at his own expense, take all the necessary steps to ensure the quality and uniformity of his product.

.5 It is never permitted to add water to the concrete during the journey from the factory to the site. It is also never allowed to add water to the concrete before discharging it from the mixer truck, unless the Laboratory has given permission to do so; where applicable, the amount of water added will be entered on the delivery slip and certified by the Laboratory.

PART 2 PRODUCTS

2.1 DESIGN CRITERIA

.1 Alternative 1 - Performance: according to CSA A23.1/A23.2 and indications of Article 2.4 Mixes.

2.2 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier is able to provide satisfactory concrete performance criteria established by the Departmental Representative and provide for monitoring compliance of the material according to the requirements of Article 1.5 Quality Assurance.

2.3 MATERIALS

.1 Portland cement: to CSA A3001, Type GU.

.2 Supplementary cementing materials: with minimum 8% silica fume, to CSA A3001.

.3 Water: to CSA A23.1.

.4 Aggregates: to CSA A23.1/A23.2.

.5 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Chemical admixture: to ASTM C494. The Departmental Representative to approve set accelerating or set retarding admixtures during cold and hot weather placing.

.6 Cure Product: white, to CSA A23.1/A23.2 and ASTM C309 Type 1, chlorinated rubber.

.7 The joint filler shall be non-degradable made with cellular polyethylene fibers or a bitumen impregnated material.

2.4 MIXES

.1 Alternative 1 – Performance Method for specifying concrete: to meet the Departmental Representative performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

.2 Characteristics of fresh concrete:

.1 Slump: 80 mm ± 20 mm

.2 Air Content: 5% to 8%

.3 Maximum water/binder ratio: 0.50

.3 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Compressive strength: 30 MPa minimum at 28 days.

.3 Aggregate size: 19 mm.

.4 L max (µm): 230

.4 Provide quality management plan to ensure verification of concrete quality to specified performance.

.5 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

.6 All aggregates proposed for exterior concrete shall be tested in accordance with CAN3-A23.2 for their alkali reactivity.

PART 3 EXECUTION

3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 – Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain the Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.10 Do not place load upon new concrete until authorized by the Departmental Representative

3.2 INSTALLATION / APPLICATION

.1 Carry out all cast-in-place concrete work conform to CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through any element, except where indicated or approved by the Departmental Representative.

.2 Where approved by the Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Sleeves and openings greater than 100 mm x 100 mm not shown must be reviewed by Departmental Representative.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.

.5 Confirm locations and sizes of sleeves and openings shown on drawings.

.6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Drainage holes and weep-holes:

.1 Form weep-holes and drainage holes in accordance with Section 03 10 00 – Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.4 Apply non-shrink grout under the railing post bearing plates in accordance with manufacturer's recommendations to obtain a contact surface equal to 100% of the grouted area.

.5 Cold Weather Concreting

.1 The Contractor must use all necessary means to meet the requirements of the CAN/CSA A23.1 for cold weather concreting.

.2 All surfaces against which the fresh concrete comes into contact must be preheated to a minimum temperature of 5 ° C and maintained at this temperature for a minimum period of 12 successive hours before placing the concrete.

.3 During the entire curing period, the Contractor must maintain the interior of the shelter at a minimum temperature above 10 ° C. For some structures, such as slabs, the Departmental Representative may require the concrete to reach 70% of the specified strength. These structures are indicated on the drawings or in the technical specifications. Once this resistance is reached, the protection can be removed or discontinued in accordance with the temperature difference indicated in CSA A23.1. However, if it is demonstrated that the concrete has not achieved the required strength, the Contractor must maintain the protective installations in place and in operation.

.6 Hot Weather Concreting

.1 The Contractor must use all necessary means to meet the requirements of the CAN/CSA A23.1 for cold weather concreting.

.2 The temperature of the concrete during pouring must be within the limits indicated in the CAN / CSA A23.1 standard and should be as close as possible to the minimum temperatures required in this table. In this regard, in order to minimize the risk of cracking, the Departmental Representative may require that the concrete be delivered at a temperature approaching minimum temperatures.

.7 Finishing and curing:

.1 When the outside temperature is 27 ° C or more, comply with the prescriptions of articles 7.4.2.4 of standard CAN / CSA A23.1-19. Follow the recommendations of the American Concrete Institute's ACI 305R: "Hot Weather Concreting" report.

.2 When the outside temperature is 5 ° C or less, or when it is possible for it to drop to this level or lower during the 24 hours following the placement of the concrete, comply with the prescriptions of articles 7.4 .2.5 of CAN / CSA A23.1-19. Follow the recommendations of ACI 306R report: "Cold Weather Concreting", from the American Concrete Institute; however, avoid overheating the concrete in place.

.3 The supply, installation and maintenance of all temporary works and devices required for the curing and protection of concrete in hot or cold weather, as well as the supply of these devices, are part of the work. contractual; assume all costs.

.4 Finish concrete to CSA A23.1/A23.2 and according to the requirements of the drawings.

.5 Use procedures as reviewed by the Departmental Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.6 Unless otherwise indicated, use a broom to do the finishing.

.7 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.8 Take the necessary precautions to eliminate the causes of deterioration of the concrete arising from shocks or vibrations. The demolition of items continuous concrete using hammers and compaction of materials (soil, granular, coated material) is prohibited within 30 m concrete fresh, and, from its establishment and until it reaches a compressive strength of to the at least 70% of f'c verified by tests on samples witnesses ripened under the same conditions as the concrete of the book.

.9 Ensure damp cure of the concrete for seven (7) days following its placing.

.10 Obtain approval from the Departmental Representative with at least 24 hours' notice, the proposed curing method.

3.3 SURFACE TOLERANCE

.1 Concrete surface tolerances must comply with CSA A23.1, and the straight-edge method.

3.4 FIELD QUALITY CONTROL

.1 Site tests: conduct following tests in accordance with section 01 45 00 – Quality control and submit report as described in Article 1.4 Action and Informational Submittals:

.1 Slump.

.2 Air content.

.3 Temperature of the mix.

.4 Compressive strength: 7 day and 28 day.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Contractor. Tests shall be carried out in accordance to CSA A23.1/A23.2.

.3 Ensure that test results are transmitted to the Departmental Representative and to the Test Laboratory Representative for them to exam during the meeting prior to the concrete casting.

.4 Test laboratory representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.5 If the results of the tests carried out by the Laboratory, in accordance with the requirements of the concrete quality control program, indicate that the concrete of an already constructed part of the structure does not have the minimum compressive strength specified , all costs incurred by the application of the provisions of standard CSA-A23.1, relating to non-compliance with the requirements of the results of tests on cylinders subjected to a standard cure, will be borne by the Contractor.

END OF SECTION

Soils and monolith Grouting
Section 03 60 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of works

1.2 REFERENCE STANDARDS

.1 American Society of Civil Engineers (ASCE) Standard

.1 ASCE/G-153 – Compaction Grouting Consensus Guide

.2 CAN/CSA A-179 – Mortar And Grout For Unit Masonry

1.3 DESCRIPTION

.1 This section specifies the requirements related to drilling and grouting program to fill voids and cavities in monolith and soil foundation and densify nearby loose material using grouting method.

1.4 TECHNICAL CONTROL AND WORK SUPERVISION

.1 The work should be done by a firm specialized and recognized in the field of voids filling injection.

.2 Drilling and grouting shall be carried out by the Contractor under technical supervision of the Departmental Representative. Technical control shall include, but is not limited to:

.1 Required modifications during on site drilling and grouting work;

.2 Approval of material, equipment and construction procedures used by the Contractor and required tests;

.3 Follow up during construction

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Seven (7) days prior to start drilling and grouting work, Contractor shall submit the Departmental Representative, for verification and approval:

.1 CV of proposed grouting field supervisor. A grouting field supervisor shall have five years of recent experience in similar grouting work.

.2 Equipment and materials datasheets, work schedule and work execution plan and procedures.

.3 A document describing the grout injection method, including the position of the injection tubes, the equipment to be used and the sequence of work.

.4 Safety and security plan.

.5 Grout test results in conformity with the technical specification requirements.

.6 Gradation analysis of the aggregates that will be used in the grouting;

.7 Equipment calibration certificates.

.8 Environmental plan in accordance with applicable laws and regulations.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Compaction grouting (voids filling): Grout mix

.1 Grout mix for compaction grouting shall be a combination of Portland cement, aggregates and water such as King RPL-2 or approved equivalent. Materials shall be thoroughly mixed and agitated to provide grout of uniform consistency. The mix shall comply with the following characteristics:

.1 Slump of 50 mm;

.2 V-Funnel : 20-30 secondes

.3 Cement Content of about 15% by weight;

.4 Low Strength in order of 2 MPa (in 28 days);

.5 Density of about 2

.6 Aggregates shall be natural rounded silty sand. Aggregates gradation shall comply with ASCE aggregate gradation envelope shown in Figure 1

.2 Monolith grouting (voids filling): Grout mix of Portland cement-based grout and air lime with a compressive strength of 20 MPa (such as King RPL-20 or approved equivalent) applied according to the manufacturer's recommendations.

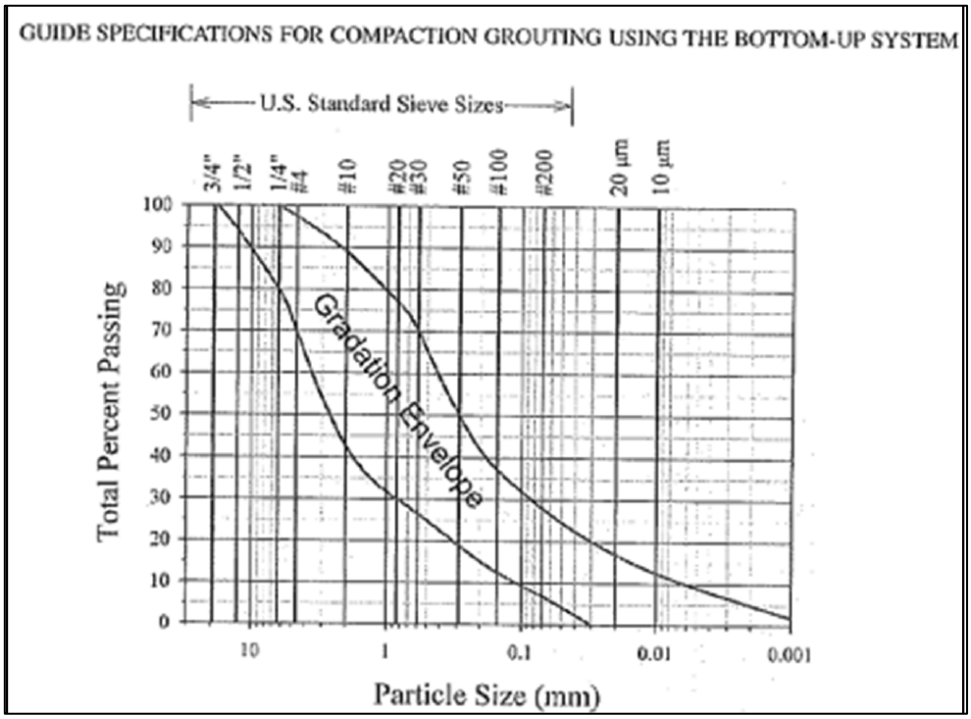


Figure 1 : ASCE Aggregates gradation for compaction grouting

2.2 EQUIPMENT

.1 All drilling and grouting equipment supplied and used in the Works shall be of a type, efficiency and mechanical conditions suitable for executing adequately the drilling and grouting operations.

.2 Drilling equipment :

.1 Hole shall be drilled by means of rotary/percussion drilling or sonic drill using only air for cleaning the hole.

.2 All drilling equipment shall produce holes free of irregularities to avoid leakage of grout around the packers.

.3 Grouting equipment :

.1 Pumping system shall be equipped with suitable automatic recording devices to record continuously grout pressure, strokes, pumping rate and grout take. Calibration of the measurement devices is required.

.2 The pump shall be capable of displacing low slump grout at the required pressure while considering the head loss due to grout lines.

.3 Pumping rate shall be between 30 and 50 liters per minute. Pump stroke frequency shall be adjusted to maintain the specified pumping rate.

.4 The length of casing individual sections shall be short enough for easy removal during grouting operations.

PART 3 EXECUTION

3.1 UPLIFT GAUGES

.1 In designed area specified by the Departmental Representative, the Contractor shall provide and install uplift gauges prior to grouting. Details for uplift gauge of the ground are shown on Figure 2.

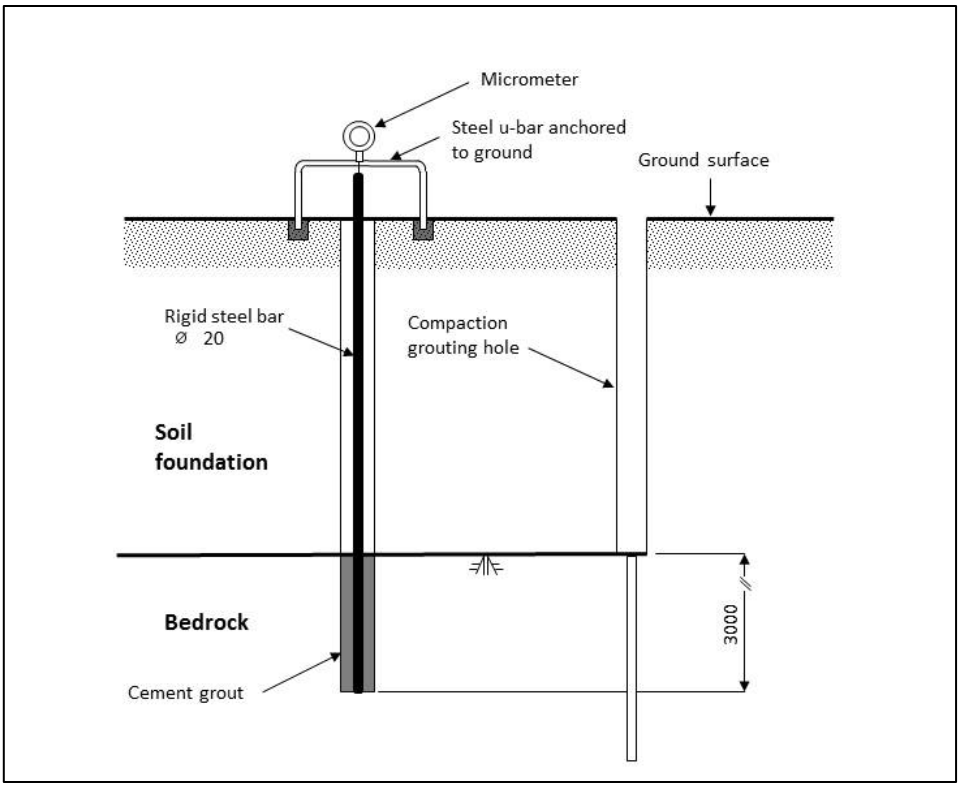


Figure 2: Uplift Gauge Installation Details

.2 The uplift gauge shall be capable of measuring the ground deformation with an accuracy of ±0.1 mm.

.3 If required, the Contractor shall remove uplift gauges at the end of the work after Departmental Representative authorization has been obtained. The hole shall be filled as described in section 3.4.4.

.4 Before starting work, advise the Departmental Representative of any structural problem concerning the masonry and any condition that does not comply with the prescribed requirements, including the existence of voids or openings likely to present risks for grout injection.

.5 Immediately inform the Departmental Representative of any unacceptable conditions detected.

.6 Begin grouting work only after correcting unacceptable conditions and receiving written approval from Departmental Representative.

3.2 DRILLING

.1 Grout holes shall be drilled at locations shown on the drawings or as required by the Departmental Representative.

.2 The drilling method shall be rotary/percussion or sonic drill with air flushing. The minimum diameter of grout holes shall be 115 mm.

.3 To drill and grout the soil compaction grouting and monolith grouting, steel casings shall be installed in the hole to the required depth shown on drawings.

.4 Each drilled hole shall be protected from clogging or obstruction by means of a temporary cap or other suitable device at the collar. Any obstructed hole shall be cleaned out or grouted and another hole shall be drilled by the Contractor.

3.3 GROUTING

.1 Grout holes are placed on a grid with a specific spacing. The number of the rows and the spacing of the holes are defined based on the dimension of the area to be grouted.

.2 Grout holes pattern and location are shown on the drawing as an indication. The Contractor will present the required pattern according to site conditions.

.3 Grouting shall start with the outer holes and progress towards internal holes in the areas to be grouted.

.4 No grouting work will be permitted if the temperature of the soil is below 2°C. Contractor shall install the thermistors to measure the temperature prior to start grouting work.

.5 After cleaning a hole, it shall be grouted using the upstage grouting method with 5 meter stages at the specified pressures for each depth.

.6 The split-spacing method shall be used for grouting; primary holes shall be drilled and grouted prior to drilling the secondary holes.

.7 The temperature of the grout at any point shall be between 5 and 30°C.

.8 A grout batch which has been in circulation for over 2 hours shall be disposed of.

.9 Effective pressure for each stage to use is 20 kPa per meter of soil. The effective pressure is applied in the hole at the location point of the parker and it is calculated from the pressure indicated on the pressure gauge at the collar of the hole. Effective pressure formula is shown on Figure 3. Effective pressure may be modified by the Departmental Representative based on the site conditions.

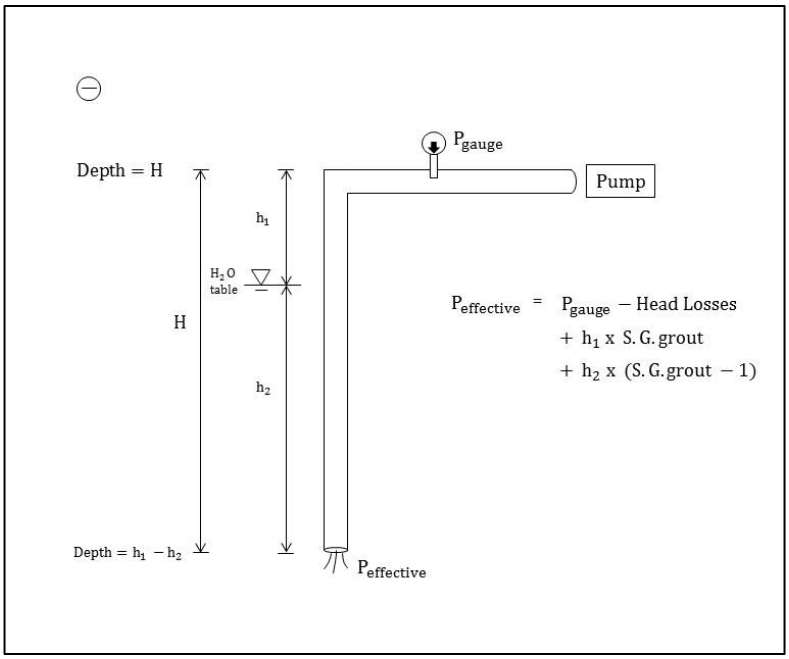


Figure 2 : Effective Pressure formula for grouting

.10 Contractor shall determine the pressure at the gauge based on grout head losses in the grout lines and the water head in the hole prior to start grouting operations.

.11 Grouting shall be performed using a preinstalled steel casing. Casing shall be pulled up in regular steps of 500 mm for each stage. The length of the stage may be modified based on the site conditions. The upper limit of the grouting is shown on the drawings.

.12 Grouting cut-off criteria are as follow:

.1 Deformation of the ground surface is noticed. The grouting operation shall stop immediately;

.2 Maximum volume of 1 m^3 per stage is reached, or

.3 Maximum effective pressure at the stage at a specified pumping rate is reached.

.13 Grouting cut-off criteria may be modified based on site conditions by the Departmental Representative.

.14 The maximum pumping rate per minute shall not exceed 50 l of grout per minute. The Contractor shall adjust the volume per stroke of the pump to comply with the pumping rate requirements.

.15 Additional holes

.1 The number and location of additional holes (tertiary holes) will be decided by the Departmental Representative based on drilling and grouting results in primary and secondary holes.

3.4 FIELD QUALITY CONTROL

.1 Twice a day, or as required by the Departmental Representative, the Contractor shall take LMG grout samples at the location of the hole to verify if it conforms to the requirements of this Section and for consistency.

.2 During the grouting operations, testing of the LMG grout shall include:

.1 Specific gravity of the grout;

.2 Slump of the grout;

.3 V-Funnel Test;

.4 Grout compressive strength.

.3 Accurate quality control records shall be kept.

.4 Hole Backfilling :

.1 After completion of the grouting, the hole shall be backfilled and the area cleaned.

3.5 RECORDS

.1 Details of drilling and grouting operations and any other relevant information shall be recorded in a daily basis. Daily report shall contain, among other things, the following information:

.1 Number and location of the hole.

.2 Length of the hole.

.3 The collar elevation and hole inclination.

.4 Grouting details, including:

.1 Stage location and length.

.2 Grout mix.

.3 Gout injected volume.

.4 Grouting Pressure.

.5 Date, time and all grouting details (Interruptions, leaks, uplift, etc.).

END OF SECTION

Historic – Mortars
Section 04 03 05.13

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 04 03 05.21 – Historic – Masonry Repointing

1.2 ALTERNATES

.1 Obtain Site Supervisor's approval before changing manufacturer's brands or sources of supply of mortar materials during entire contract or other methods of mixing mortar specified elsewhere in this specification.

1.3 REFERENCES

.1 CSA International

.1 CAN/CSA-A179-04, Mortar and Grout for Unit Masonry.

1.4 TECHNICAL DATA SHEETS

.1 Submit technical data sheets of products used at least fifteen (15) days prior to commencing work.

1.5 TESTING STANDARDS

.1 Flow and cube strength: to ASMT C 270.

.2 Vicat cone test: to ASTM C780.

.3 Cube strength: conform to CAN/CSA-A179, appendix B.

.4 Flexural bond strength: to ASTM C1072.

1.6 AMBIENT CONDITIONS

.1 Execute work when ambient temperature is above 10 °C. When ambient temperature is below 10 °C, cover and heat work as directed by Site Supervisor.

.2 Prepare and maintain temperature of mortar between 5 and 40 °C until used.

.3 Maintain the temperature of receiving surface and mortar between 10 and 25 °C for 72 hours after application in summer and for 30 days in winter.

PART 2 PRODUCTS

2.1 MORTAR

.1 Type N joint and bedding mortar: based on proportion specifications, consisting of 1 part of white Portland cement, 1 part lime, and 6 parts sand.

.2 Type S joint and bedding mortar: based on proportion specifications, consisting of 2 parts grey Portland cement, one (1) part lime, and nine (9) parts sand.

.3 Type O joint and bedding mortar: based on proportion specifications, consisting of 1 part of white Portland cement, two (2) parts lime, and nine (9) parts sand.

.4 Repointing mortar for coping stones: use gray polyurethane flexible mortar containing sand.

.5 All dry mortar materials shall be premixed at the plant, bagged and originate from one (1) only manufacturer.

.6 Mix using a clean mechanical mixer free of dried mortar, traces of rust and other contaminants. Do not thaw equipment with salt or anti-freeze agents.

.7 The mortar must be used within one hour (1 hour) of mixing. Beyond this period, the mortar must be thrown away.

.8 Do not regain the mortar. If it loses plasticity, just mix again without adding water.

2.2 COMPRESSIVE STRENGTH

.1 Compressive strength measured on collected samples shall comply with the following:

.1 Type N mortar:

.1 Compressive strength 2 MPa at 7 days

.2 Compressive strength 3,5 MPa at 28 days

.2 Type S mortar:

.1 Compressive strength 5 MPa at 7 days.

.2 Compressive strength 8,5 MPa at 28 days

.3 Type O mortar:

.1 Compressive strength 2,5 MPa at 28 days.

2.3 AIR CONTENT

.1 Type N mortar: 18 % maximum.

.2 Type S mortar: 18 % maximum.

.3 Type O mortar: 14 % maximum.

PART 3 EXECUTION

3.1 LIME MORTAR BATCHING

.1 Mix mortar in a clean mortar mixer. Use potable water in quantities recommended by the manufacturer and mix as indicated.

3.2 POLYURETHANE MORTAR BATCHING

.1 Mix mortar components to manufacturer's recommendations.

3.3 CLEANING

.1 Remove droppings and splashings using clean sponge and water.

.2 Clean masonry with low pressure clean water and soft natural bristle brush.

END OF SECTION

Historic – Masonry Repointing
Section 04 03 05.21

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 04 03 05.13 – Historic – Mortars.

1.2 REFERENCE STANDARDS

.1 Definitions:

.1 Raking: removal of loose/deteriorated mortar.

.2 Repointing: filling and finishing of masonry joints from which mortar is missing, has been raked out or has been omitted.

.3 Tooling: finishing of masonry joints using tool to provide final contour.

.4 Low-pressure water cleaning: water soaking of masonry using less than 350 kPa (50 psi) water pressure, measured at nozzle tip of hose.

.2 Reference Standards:

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-04, Mortar and Grout for Unit Masonry.

.3 Perform the work in accordance with the requirements of standard CAN / CSA-A371-14 Masonry construction for buildings and in accordance with the requirements of environmental protection.

1.3 QUALITY ASSURANCE

.1 Masonry Contractor :

.1 Call upon only one Masonry Contractor for masonry work .

.2 Masonry Contractor will to be capable of demonstrating his skills in historic stone masonry work on project of similar size and complexity to Work of this contract during the last 10 years.

.3 Masonry Contractor to have good level of understanding of structural behavior of masonry walls when masonry work involves replacing or repairing stonework which are part of structural masonry work.

.2 Masons :

.1 Masons to have certificate of qualification in historic stone masonry work.

.2 Masons to have proof of license certification for proprietary restoration mortars.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to site in original factory packaging, labelled with manufacturer’s name, address.

.2 Keep material dry. Protect from weather, freezing and contamination.

.3 Ensure that manufacturer's labels and seals are intact upon delivery.

.4 Remove rejected or contaminated material from site.

1.5 AMBIENT CONDITIONS

.1 Maintain masonry temperature between 10 and 27 °C for duration of work.

.2 Ambient temperature lower than 10°C: Store mortaring materials for immediate use within heated enclosure in accordance with section 04 03 05.13 – Historic – Mortars and allow them to reach minimum temperature of 10 °C before use.

.3 Only water can be heated before use. Provide hot water to a maximum 40 °C on site during cold weather.

.4 Maintain mortar mix temperature between 5 and 40 °C.

PART 2 PRODUCTS

2.1 MORTAR

.1 Mortar: in accordance with CAN/CSA-A179 and Section 04 03 05.13 - Historic - Mortars.

PART 3 EXECUTION

3.1 RAKING JOINTS

.1 Use manual raking tool to remove deteriorated and bonded mortar from masonry units. The use of saw is strictly prohibited.

.1 Remove deteriorated and adhered mortar from masonry surfaces to sound mortar maximum depth of 100 mm, leaving square corners and flat surface at back of cut.

.2 Clean out voids and cavities encountered.

.2 Ensure that no stones and other masonry units are chipped, altered or damaged by work to remove mortar in joints.

.3 Clean surfaces of joints by compressed air or water under low pressure without damaging texture of exposed joints or masonry units.

.4 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.

.5 Leave no standing water.

3.2 REPOINTING

.1 Dampen joints as well as masonry units.

.2 Keep masonry damp while pointing is being performed.

.3 Completely fill joint with mortar. Use type "S" mortar.

.1 If surface of masonry units has worn rounded edges keep pointing back from surface to keep same width of joint.

.2 Avoid feathered edges.

.3 Pack mortar firmly into voids and joints.

.4 Build-up pointing in layers not exceeding 20 mm in depth.

.1 Allow each layer to set before applying subsequent layers.

.2 Maintain joint width to full depth.

.5 Remove excess mortar from masonry face which may create loose components before it sets.

3.3 PROTECTION DURING CURING PROCESS

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day. Membranes shall be tightly installed to prevent finished work from drying out too rapidly.

.2 Cover with waterproof tarps to prevent weather from eroding recently repointed material.

.1 Maintain tarps in place for minimum of 2 weeks after repointing.

.2 Ensure that bottoms of tarps permit airflow.

.3 Anchor coverings securely in position.

.4 Damp cure :

.1 Provide damp cure for pointing mortars.

.2 Install and maintain wetted burlap protection during the curing process and over minimum three (3) days.

.3 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.

.4 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.5 Protect from drying winds. Pay particular attention at corners of structure. Maintain ambient temperature of minimum 10 °C after repointing masonry for:

.1 Minimum 3 days in summer.

.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

3.4 CLEANING

.1 Clean surfaces of mortar droppings which may create loose components on the surface to be concreted.

3.5 PROTECTION OF COMPLETED WORK

.1 Protect adjacent finished work against damage which may be caused by on-going work.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

.1 ASTM International

.1 ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for Generalities Service.

.3 ASTM A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 CSA International

.1 CSA G40.20/G40.21- General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CAN/CSA G164 - Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 CSA S16-14 – Design of Steel Structures

.4 CSA W48 - Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.5 CSA W59 - Welded Steel Construction (Metal Arc Welding) [Metric].

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

.1 WHMIS Safety Data Sheets (SDS)

.4 The Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for tubing, pipe, sections, plates and bolts and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two (2) samples of the SDS data sheets as per WHMIS regulation.

.1 In case of paint, primers and other finishing products applied on site, indicate VOC content (g/L).

.2 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.

.2 Shop drawings must indicate general layout, profile dimensions, materials, steel grade, core thicknesses, finishes, connections, welds, bolts dimensions and grade, joints, holes, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

.3 Do not start manufacturing before obtaining approval of shop drawings.

1.3 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Certifications: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in dry location off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new materials.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Steel sections and plates: to CSA G40.20/G40.21, Grade 350W or 300W.

.2 Steel pipe: to ASTM A53/A53M, Class B.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307, except as identified on drawings.

.6 Structural bolts: to ASTM A-325, galvanized.

.7 Grout: non-shrink, non-metallic, flowable, 25 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

.2 Use self-tapping shake-proof flat headed screws on items requiring assembly by screws or as indicated.

.3 Where possible, fit and shop assemble work, ready for erection.

.4 Exposed welds continuous for length of each joint. File or grind exposed welds smooth and flush.

2.3 SHOP PAINTING AND GALVANIZING

.1 Structural components to be galvanized to CAN/CSA-G164 (600g/m2). Provide structural arrangements to galvanize the structure.

.2 Bollards and beacons to be painted in black.

.3 Galvanized steel painting for bollards and beacons:

.1 Preparation of steel SSPC-SP16, minimum profile 1.5 mils.

.2 Galvanized steel shop painting:

.1 Brush weld joints and sharp edges before each coat with spray gun for middle and top coat

.2 One primer coat: hot dip galvanizing.

.3 One intermediate layer: Amerlock 2, 6 to 7 mils dry.

.4 One coat (epoxy polysiloxane finish): Amercoat PSX 700 4 to 6 mils dry.

.3 Color

.1 Intermediate: middle grey

.2 Finish: black

.4 Contractor shall select a paint system equivalent to that describe above, subject to approval by Departmental Representative.

2.4 BOLTS

.1 As shown on drawings.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts acceptable for metal fabrications installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions remedied and after receipt of written approval to proceed from Departmental Representative.

.4 Check all dimensions and elevations on site using surveys before starting to manufacture structural members attached to concrete members. The check must be done early enough to avoid any delays at the site.

3.2 ERECTION

.1 The contractor is fully responsible for the choice of technique and the mobilization of equipment that will allow him to perform his work quickly and safely.

.2 Secure to the frame temporary bracing, transverse links and guy cables of sufficient strength to withstand the loads due to extreme winds or other, as long as the final assemblies of the frame elements are not completed.

.3 Leave temporary bracing in place if permanent stability of construction depends on work by other trades until such work is completed.

.4 The frame must be erected in strict accordance with the requirements of article 29 of standard CAN / CSA – S16-14.

.5 Carry out welding work in accordance with CSA W59 unless specified otherwise.

.6 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.7 Comply with the mounting tolerances specified in CAN / CSA-S16-14.

.8 Provide and install appropriate anchors approved by the Departmental Representative such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.

.9 Exposed fastening devices to match finish and be compatible with material through which they pass.

.10 Supply components for work by other trades in accordance with shop drawings and schedule.

.11 Make field connections with bolts conform to CSA S16.

.12 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

3.3 GALVANIZING

.1 Galvanizing

.1 Conformity certificate

.1 For each delivery of galvanized steel, provide a certificate of compliance containing the following information to Departmental Representative:

.1 Galvanizing company;

.2 Galvanizing date and place;

.3 Coating thickness;

.4 Coating adhesion;

.5 Coating quality.

.2 Reception check

.1 Reception check carried out by Departmental Representative is tests for thickness, adhesion and coating quality performed in accordance with ASTM A123/ A123M “Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products”.

.3 Surfaces preparation

.1 Surfaces to be galvanized shall be clean, free of paint, grease, rust, etc. Deposits and residues from welding work, mill scale and paint or thick rust deposits shall be removed by appropriate methods. Final stripping shall be done by submerging in a caustic solution followed by rinsing with clean water and submerged in dilute sulfuric or hydrochloric acid. After stripping, the parts shall be submerged in an aqueous solution of zinc chloride and ammonium.

.4 Galvanizing process

.1 Galvanization to be in accordance with ASTM A123 / A123M "Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products".

.2 Steel surfaces of the bottom flange of the girders and bearings in contact with the welds to secure the beam supports shall be ground after galvanizing.

.3 The minimum thickness of galvanization is 100 µm, except for HSS steel tubes, where the minimum thickness is 75 µm.

.5 Protection of galvanized elements

.1 Protect galvanized elements from damage during handling and storage.

.2 Protect the element in contact with the lifting equipment, such as cables and chains.

.3 Storage of galvanized elements, except for reinforcement, shall be done so that the air circulates between the parts, that the water does not accumulate and drip freely, and that there is no metal-to-metal contact of the galvanized parts. During installation of the galvanized retainers, Contractor is fully responsible for ensuring that there is no white rust on these parts

.6 Repair after galvanizing

.1 Damaged surfaces less than 2.5 cm wide shall be repaired by adding 2 coats of zinc-rich plaster with a minimum of 87% zinc metal in the dry film. Total surface to be repaired by coating rich in zinc must be less than 0.5% of the total surface of the part. Damaged surfaces shall first be cleaned in accordance with SSPC-SP 11 "Power Tool Cleaning to Bare Metal". The minimum total thickness of the dry film of coating shall be 130 µm.

.2 Damaged surfaces with a width greater than 2.5 cm and parts with a damaged surface greater than 0.5% of the total area of the part shall be re-galvanized or repaired by metallization. Clean damaged surfaces according to the requirements of SSPC-SP 5 / NACE N° 1 "White Metal Blast Cleaning" or SSPC-SP 11 "Power Tool Cleaning to Bare Metal". The minimum thickness of the metallized coating is 130 µm.

3.4 CLEANING

.1 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Departmental Representative requirements.

3.5 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

Catwalk
Section 06 50 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of Works

1.2 DESCRIPTION

.1 This section specifies the requirements related to the supply and installation of the catwalk.

1.3 CONTRACTOR RESPONSIBILITY

.1 The Contractor is responsible to survey and to validate all dimensions that can affect the design and the realization of the catwalk. In case the Contractor finds differences between measured dimensions and the ones shown on drawings, the Contractor shall advise Departmental Representative immediately.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Wood for fabrication of the catwalk shall conform to the following requirements:

.1 White oak : «Select Car Stock» quality as per « National Hardwood Lumber Association ». Lumber shall be free of cracks, holes or equivalent defects on all faces. Knots shall be sound and the heart of the wood shall be solid. Worm holes are acceptable under 3 mm to a limited extent.

.2 Douglas fir : « Select Structural» quality as per National Lumber Grades Rules (NLGA), 2003, Article 131. More specifically, Douglas fir lumber shall be free of cracks, holes, crevices or equivalent defects on all faces.

.3 Lumber shall be dried up to 25% humidity level before CCA treatment. Drying shall be executed as per best practices; lumber shall be stored in bundles, spaced in order to have a good air circulation on all faces. Lumber shall not be exposed to weather.

.4 The Contractor shall provide a written certification to the Engineer confirming that lumber has been dried as requested.

.5 Provide a thickness allowance before drying in order to respect final dimensions after planning of lumber on all faces.

.2 Bolts - Rods

.1 Conform to ASTM A307 standard.

.2 Mechanical bolts shall be square headed, hot dip galvanized, including washers and nuts.

.3 Countersunk bolts shall be hot dip galvanized including washer and nuts.

.4 Threaded rods shall be hot dip galvanized including washers and nuts.

.5 Stainless steel screws shall conform to ASTM A 276 (grade 304).

.3 Steel Sections – Fabricated Metal

.1 Conform to G 40.21 grade 300W.

.2 Stainless steel parts shall conform to ASTM A 276, grade 316.

.4 Cast Steel

.1 Shall conform to ASTM A536 65-45-12.

.2 All cast steel sections shall be true to pattern, well finished, homogeneous and without blow-holes, porosities, hard spots, shrinkage defects, cracks or other visual defects. Surfaces of casting that are not machined shall be free of foundry irregularities, projections, edges, cavities, screenings, picots marks or burin marks so that they will not require smoothing operations prior to painting.

.3 Cast steel secion shall not be repaired without prior acceptance of the Departmental Representative. Acceptance shall be denied if the repair will affect the strength, the machining or the functionality of the section. No process other than welding will be allowed to repair casting. Repair welding shall not be accepted after the final thermal treatment.

2.2 PRESERVATIVE

.1 Treat wood with an alkaline copper quaternary (ACQ) preservative conform to standard CSA 080.08. Provide eight additional litres for “Parks Canada” usage.

2.3 PAINT

.1 Primer: « Intershield 300 » aluminium color fabricated by « International Paint » or equivalent approved by the Engineer.

.2 Paint: « Intergard 377 » black color fabricated by « International Paint » or equivalent approved by the Engineer.

.3 Top coat for the part not in contract with the water in the canal : Interthane 990HS by « International Paint » or equivalent approved by the Engineer.

.4 Provide two additional litres of primer and paint for « Parks Canada » usage.

.5 A sample must be submitted for all equivalent paint request.

2.4 GALVANIZING

.1 Hot dip galvanized in workshop with a minimal zinc coating of 600 g/m2, conform to standard CSA G164, latest edition.

PART 3 EXECUTION

3.1 WOOD PARTS

.1 Plane, cut, trim and round off wood parts as shown on the drawings.

.2 Groove, mortise, drill, bore and countersink wood parts at the locations as shown on the drawings.

3.2 LAY SCREWS

.1 For the lay screws, drill holes of required diameter and length for the threaded and non-threaded part. Lay screws shall be screwed with a wrench and shall not be installed with a hammer.

3.3 STEEL SECTIONS

.1 Cut as indicated on the drawings.

.2 Drill and countersink as indicated on drawings.

.3 Install flush where required.

.4 Grind sharp edges exposed to pedestrians.

3.4 HANDRAILS AND CATWALKS

.1 Existing catwalk shall be removed and handed over to Parks Canada. It will be replaced by new one as shown on drawings.

.2 Existing handrails installed on the catwalk must be removed and disposed by the Contractor. Contractor shall provide new handrails as shown on drawings.

.3 Existing handrails downstream of the spillway can be recuperated and repainted according to the Section 09 91 13.01. The Contractor must take into account that the existing paint on the handrails is lead paint.

.4 Repair damaged sections of existing handrails as required.

.5 Provide rigid metal mesh fixed to the handrail, as shown on the drawings. No sharp element should be visible once fixed in place.

.6 Contractor shall provide new hardware in order to install gate handrails and catwalk.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 02 83 10 – Lead-Base paint abatment minimum precautions.

1.2 REFERENCE STANDARDS

.1 Society for Protective Coating (SSPC).

.1 SSPC-SP 11, Power-Tool cleaning to Bare Metal.

1.3 QUALITY ASSURANCE

.1 Qualifications.

.1 Qualified worker as defined by local jurisdiction to be engaged in painting work.

.2 Apprentices: may be employed provided they work under direct supervision of qualified worker in accordance with trade regulations.

.2 Retain purchase orders, invoices and documents to prove conformance with requirements when requested by Departmental Representative.

1.4 WORK SCHEDULE

.1 Not used.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.1 Submit samples of all available colors for review and selection; specify when color range is limited.

.2 Submit data sheets and manufacturer's instructions for paint products and coatings.

.3 Submit Material Safety Data Sheets (MSDS) required by the Workplace Hazardous Materials Information System (WHMIS) for paint products and coatings.

.4 Quality Assurance:

. 1 Manufacturer's instructions: Submit manufacturer's instruction for application.

1.6 MAINTENANCE

.1 Replacement materials.

.1 Provide one (1) four (4) liter container of each type and color. Identify the product color and type according to the color schedule and system specified.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Delivery, handling and unloading.

.1 Transport, store and handle paint products as specified below.

.2 Transport and store paint products in their original containers, sealed and with undamaged labels.

.3 Labels to indicate:

.1 Name and address of the manufacturer;

.2 Type of paint or coating;

.3 Compliance with applicable standard;

.4 Color number in accordance with established color schedule.

.4 Remove degraded, opened or rejected products from site.

.5 Follow manufacturer's recommendations for storage and handling.

.6 Store materials in clean, dry, well-ventilated area, with temperature range 10 degrees C to 30 degrees C. Store materials and supplies away from heat generating devices and follow manufacturer's recommendations for the minimum temperature storage.

.7 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.

.8 Remove paint materials from storage only in quantities required for same day use.

.9 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling storage, and disposal of hazardous materials.

.10 Fire Safety Requirements.

.1 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site daily.

.2 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).

.2 Waste management and disposal.

.1 Paints, stains, wood preservatives and other related products (thinners and solvents) are hazardous materials; their disposal is subject to various regulations. Information on relevant legislation can be obtained from provincial ministries responsible of the environment and government agencies of the region.

.2 Products not reused shall be treated as hazardous waste and disposed of properly.

.3 Place hazardous or toxic products and materials, including used tubes and containers of adhesive and sealant, in areas or containers intended to receive hazardous waste.

.4 To reduce contamination of soil or waterways and sanitary and stormwater systems, follow the following guidelines:

.1 Maintain washing water for paints and other water-based products to allow filtration of various deposited materials. Recover washing water after cleaning used equipment.

.2 Store cleaning products, thinners, solvents and excess paint in designated containers and dispose them properly.

.3 Store oil and solvent soaked rags during painting to recover contaminants and proper disposal or cleaning, as appropriate.

.4 Contaminants disposal in accordance with the Hazardous Waste Regulations

.5 Dry empty paint containers before disposal or recycling (in appropriate facilities).

.6 Seal containers of partially used paint products, including adhesive and sealant containers, and store at moderate temperature in a well-ventilated, fire-resistant area.

.5 For paint recycling service, collect excess paint, classify by product type and ship to collection or recycling facility.

1.8 SITE CONDITIONS

.1 Application conditions:

.1 Painting works on existing handrails must be done in shop.

.2 Note that the existing paint on the handrails and gains may contain lead. Be sure to take the necessary precautions as described in Section 02 83 10 – Lead-Base paint abatment minimum precautions.

.3 Perform painting in areas where ambient air is free from suspended dust generated by construction or windblown particles to not alter finished surface results.

.4 Paint and sand residues caused by the sandblasting of the items shall be disposed of in accordance with the instructions in the specification.

.5 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.6 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise specified and approved by manufacturer.

.7 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

.8 Do not apply paint when:

.1 Substrate and ambient air temperatures are expected to fall outside paint manufacturer's prescribed limits;

.2 Surface to be painted is wet, damp or frosted.

.9 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.10 Put in place adequate containment and recovery measures to minimize dispersion of contaminants in air and soil (sanding residue, cleaning of joints and any other residue). For example, installing a shelter and a tarpaulin to trap sandblasting particles and paint residue generated by cleaning work. The shelter must offer impermeability to prevent leaching in the event of rain and a ground catchment mechanism to prevent discharge into the Canal.

.11 Respect the allowable contents specified in the regulations for the silica content in the sandblasting abrasive used for steel cleaning.

.12 Whenever possible, use an abrasive with less impact than silica (eg. lolivine).

.13 Refer to the *Regulation respecting the quality of the work environment* (S-2.1, r. 11) and the *Regulation respecting occupational health and safety* (S-2.1, r. 13).

.14 Use appropriate personal protection (mask, gloves, glasses, etc.) according to the exposure values of lead, silica and dust.

.15 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.16 Use tarpaulins to transfer paint or other application products from storage and mixing containers to application devices or containers. Use secondary containment containers with a minimum capacity equivalent to 110% of the volume of the container containing the paint to minimize the risk of spillage.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Paint materials for paint systems: to be products of single manufacturer.

.2 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising there from, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.3 Paint materials must not be formulated or manufactured with formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium or their compounds.

2.2 COLOURS

.1 Submit proposed Colour Schedule to Departmental Representative.

.2 First coat in two coat system to be tinted slightly lighter colour than top coat to show visible difference between coats.

2.3 PAINT SYSTEM FOR REFURBISHMENT WORKS OF BEAM LIFTING SYSTEM AND HANDRAILS

.1 Sandblasting SSPC-SP 11, Power-Tool cleaning to Bare Metal.

.2 Primer epoxy coat, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.3 An epoxy interlayer, AMERCOAT 240LT or equivalent approved by Departmental Representative, 8 to 10 mils DFT total.

.4 Polyurethane topcoat, AMERCOAT 450H or equivalent approved by Departmental Representative, 2 to 3 mils DFT total.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

.2 Provide the scaffolding required.

3.2 EXAMINATION

.1 Exterior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of one (1) week prior to commencement of work and provide copy of project repainting specification and Finish Schedule, including drawings and elevations.

.2 Exterior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify Departmental Representative in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

3.3 PREPARATION

.1 Apply paint materials in accordance with paint manufacturer's written application instructions.

.2 Do not apply paint until prepared surfaces have been accepted by Departmental Representative.

.3 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.

3.4 EXISTING CONDITIONS

.1 Prior to start the work, review existing field conditions and exterior substrates to be refurbished, and report in writing to Departmental Representative any unsatisfactory or defective condition as applicable.

.2 Do not proceed with work until unsatisfactory condition or defects have been corrected, ands surfaces are acceptable to the Contractor and Paint Inspection Agency.

3.5 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by Departmental Representative.

.2 Protect factory finished products and equipment.

.3 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations, store items and re-install after painting is completed.

3.6 APPLICATION

.1 Conform to manufacturer's application instructions unless specified otherwise.

.2 Apply coats of paint as continuous film of uniform thickness. Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer. Repaint thin spots or bare areas before next coat of paint is applied.

.3 Sand and dust between coats to remove visible defects.

3.7 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, refurbishment paint shall cover exterior exposed components of previously coated electrical and mechanical equipment (switchboards, piping, ducts and fittings, supports/suspension, etc.)

.2 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with color and finish to match adjacent surfaces, except as noted otherwise.

.3 Do not paint over nameplates or informational plates.

3.8 FIELD QUALITY CONTROL

.1 Advise Departmental Representative when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.2 Cooperate with inspection firm and provide access to areas of work.

3.9 CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

.2 Remove dripping, burrs, splashes, paint drippings and excess spray paint by using non-damageable materials and methods as work progress.

.3 Quickly clear work area of surplus materials and debris, as well as tools, no longer needed materials and equipment.

.4 Remove combustible waste and empty paint containers from site daily and safely dispose in accordance with the requirements of authorities having jurisdiction.

.5 Clean equipment used. Remove the washing water from the water-based paint products, solvents used for oil products cleaning as well as cleaning and protective materials (rags, protective cloths, ribbons, cache and others), paint products, thinners, paint strippers and other stain removers, in accordance with the requirements of authorities with jurisdiction and instructions provided.

.6 Clean paint materials and equipment in sealed containers for deposition. Safely dispose of residues collected at the end of the cleaning process in accordance with the requirements of the authorities having jurisdiction. The metallic elements containing lead paint to be disposed must be sent in a technical landfill according to the criteria of solid lead content.

.7 Residues from sandblasting or paint stripping containing lead must be subjected to a leaching test to determine if they are considered hazardous materials.

.8 Treat residues of sandblasting with silica and lead paint (which exceed the applicable criterion for leaching tests) as residual hazardous materials (RHM), as stipulated in the *Regulation respecting hazardous materials*. Put in place the appropriate measures to:

.1 Recover all sanding and painting residues.

.2 Store residues in an airtight manner.

.3 Dispose of residues in sites authorized by the MELCC.

.9 Recycle unused paint and coatings as indicated.

3.10 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashing on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of Departmental Representative. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 03 – Commissioning

.2 Section 26 05 20 – Wire and Box Connectors (0-1000 V)

.3 Section 26 05 21 – Wires and Cables (0-1000 V)

.4 Section 26 05 22 – Connectors and Terminations

.5 Section 26 05 34 – Conduits, Conduit Fastenings and Conduit Fittings

.6 Section 26 50 00 – Lighting Devices

1.2 REFERENCE STANDARDS

.1 Canadian Standard Association (CSA)

.1 CSA C22.10, Québec Construction Code, Chapter V – Electricity.

.2 CAN3-C235, Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, operation limits, finish and contact information of Supplier or Distributor.

.3 Shop drawings.

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.

.2 Submit wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, electrical conduit, ductwork, and other items that must be shown to ensure coordinated installation.

.3 Identify on wiring diagrams circuit terminals and indicate internal wiring for each item of equipment and interconnection between equipment.

.4 Drawings must indicate clearances for operation, maintenance, and replacement of operating equipment devices.

.5 If changes are required, notify Departmental Representative of these changes before they are made.

.4 Certificates.

.1 Provide CSA certified equipment and material.

.2 Where CSA certified equipment or material is not available, obtain the corresponding approval from approved certification agency and submit the certificates to the Departmental Representative for approval before delivery to site.

.3 Submit test results of installed electrical systems and instrumentation.

.4 Permits and fees: in accordance with General Conditions of contract.

1.4 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance information for incorporation into manual.

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel of Parks Canada.

.2 Operating and maintenance instructions to include following:

.1 Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment;

.2 Start up, settings, operating, lubrication, and shutdown procedures;

.3 Safety precautions;

.4 Procedures to be followed in event of equipment failure;

.5 Other instruction as recommended by manufacturer of each system or item of equipment.

.3 Lighting system operating and maintenance instructions for the Spillway 2 the shall be provided in a manual.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground in dry, clean and well-ventilated area and in accordance with manufacturer's recommendations.

.2 Store and protect materials and equipment from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new materials.

PART 2 PRODUCTS

2.1 DESIGN REQUIREMENTS

.1 Operating voltages conform to CAN3-C235.

.2 Motors, electric heating, command/control/regulation and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

.3 Language operating requirements: provide identification nameplates and labels for control items in French.

2.2 MATERIALS AND EQUIPMENT

.1 Provide material and equipment in accordance with Section 01 61 00 - Common Product Requirements.

.2 Assemble control panels and component assemblies in factory.

2.3 EQUIPMENT IDENTIFICATION

.1 Not required

2.4 WIRING IDENTIFICATION

.1 Identify wiring with permanent indelible identifying numbered markings, on both ends of phase conductors of power and control cables.

.2 Maintain phase sequence and color coding throughout.

.3 Color coding: to CSA C22.10.

PART 3 EXECUTION

3.1 PROTECTION AND PRECAUTIONS

.1 Perform the work in such a way as not to interfere with the normal operations of the facility. Cooperate with the site administrator and ensure that the arrangements are acceptable to the Departmental Representative.

.2 Execute the work in a manner that is the least likely to inconvenience the operation and users of government property and adjacent properties.

.3 Perform all necessary work to ensure continuity of existing services at all times.

3.2 EXAMINATION

.1 Verification of Conditions: before proceeding to installation, verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions

.1 Visually inspect surfaces and supports.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.3 INSTALLATION

.1 Carry out complete installation in accordance with CSA C22.10 unless specified otherwise.

.2 The location of the electrical equipment may be changed without additional charge or credit, provided that the displacement does not exceed 5000 mm and notice is given before installation.

.3 Note that drawings indicate the approximate location of the equipment, material, accessories and conduits. exact location shall be determined on site; furthermore, check on site the space available before installing the equipment, material, accessories and conduits.

.4 Note that the dimensions and external distances of the site are approximate and not the result of a survey. The Contractor shall verify all distances and dimensions used for estimating, purchasing equipment, construction or any other reason.

.5 The Contractor is responsible for performing all necessary coordination of subcontractors and trades.

3.4 NAMEPLATE AND LABELS

.1 Ensure manufacturer's nameplates, CSA labels and identification nameplates are visible and legible after equipment is installed.

3.5 FIELD QUALITY CONTROL

.1 Conduct following tests in accordance with Section 01 45 00 - Quality Control:

.1 Lighting fixtures;

.2 Insulation resistance testing:

.1 Megger circuits, feeders and equipment with rated voltage up to 350 V with a 500 V instrument.

.2 Check resistance to ground before energizing.

.2 Carry out tests in presence of Departmental Representative.

.3 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.4 Provide calibration certificates for measurement instruments used (1 minimum).

3.6 SYSTEM STARTUP

.1 Instruct the operating personnel and the Departmental Representative in operation, care and maintenance of systems, system equipment and components.

.2 Provide training for operations and maintenance personnel in all aspects of their maintenance and operation.

3.7 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

.1 Leave Work area clean at the end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

Electrical – Commissioning
Section 26 05 03

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 GENERAL

.1 Obtain written permission from Departmental Representative to start commissioning, at least ten (10) days prior to scheduled start-up date. The application for authorization shall be accompanied with the following information:

.1 The equipment to be commissioned;

.2 Commissioning procedures, including lockout and work permits;

.3 The names of the persons who will participate in the commissioning.

.2 Systems subject to commissioning are relative to the lighting system.

.3 Commission each system using procedures prescribed by suppliers.

1.3 GOAL

.1 Commissioning is intended to ensure that the facility is ready for full operation. It must include guarantees that the system will meet the intent of the concept and the requirements of the Departmental Representative.

1.4 COORDINATION

.1 Coordinate the commissioning procedures with the disciplines and trades involved as well as the personnel responsible of operations.

1.5 SUPERVISION

.1 Commissioning shall be done under the supervision of qualified personnel and the Departmental Representative.

.2 Follow the progress of the commissioning work. Establish and maintain detailed records of activities and results.

1.6 DEMONSTRATION

.1 Demonstrate to Parks Canada and the Departmental Representative the lighting fixture good functioning.

1.7 FINAL SETTINGS

.1 Upon completion of commissioning to the satisfaction of the Departmental Representative, place all equipment and instruments in their final positions and settings.

.2 Mark all settings permanently.

1.8 COMMISSIONING REPORT

.1 Submit a final commissioning report to the Departmental Representative; this report shall:

.1 Indicate final measurements and adjustments and certify test results.

.2 Be signed by the person responsible of the commissioning.

.2 The format of the report shall be approved by the Departmental Representative prior to system commissioning.

END OF SECTION

Electrical – Wire and Box Connectors (0-1000 V)
Section 26 05 20

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Electricity - Common Work Results for Electrical.

.2 Section 26 05 21 – Wires and Cables

.3 Section 26 05 22 – Connectors and Terminations

1.2 REFERENCE STANDARDS

.1 CSA International

.1 CAN/CSA-C22.2 no.18.1 – Metallic outlet boxes (Tri-National Standard with ANCE NMX-J-023/1 and UL-514A).

.2 CAN/CSA-C22.2 no.18.3 – Conduit, tubing and Cable Fittings (Tri-National Standard with ANCE NMX- J-017 and UL-514B).

.3 CAN/CSA-C22.2 no. 65 – Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE).

.2 National Electrical Manufacturers Association (NEMA).

PART 2 PRODUCTS

.1 Materials.

.1 Compression type connectors for copper conductors conforming to CAN/CSA-C22.2 No.65.

.2 The terminal blocks must have 600 V isolation.

.3 Accepted manufactures are:

.1 Weidmuller

.2 Entrelec

.3 Wieland

PART 3 EXECUTION

3.1 EXAMEN

.1 Verification of Conditions: prior to start installation, verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 INSTALLATION

.1 Remove insulation carefully from ends of conductors and cables and, as applicable, as follow:

.1 Install mechanical compression type connectors and tighten screws with appropriate compression tool recommended by manufacturer.

.2 Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.

END OF SECTION

Electrical – Wires and Cables (0-1000 V)
Section 26 05 21

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Electricity – Common Work Results for Electrical.

.2 Section 26 05 20 – Wire and Box Connectors.

.3 Section 26 05 22 – Connectors and Termination.

1.2 REFERENCE STANDARDS

.1 Canadian Standard Association (CSA)

.1 CSA C22.2 N° 0.3 - Test Method for Electrical Wires and Cables.

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data.

.1 Submit manufacturer's instructions, printed product literature and data sheets; the data sheets shall include product characteristics, performance criteria, physical size, operation limits and finishing.

PART 2 PRODUCTS

2.1 RW90 CABLE (WIRE)

.1 Cable: in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Conductors shall be copper, minimum temperature -40 °C.

.3 Size, as indicated on drawings.

.4 Insulation.

.1 Cross-linked polyethylene (XLPE).

.2 Rating:600 V

PART 3 EXECUTION

3.1 FIELD QUALITY CONTROL

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform tests before energizing electrical system.

3.2 RW90 CABLE (WIRE) INSTALLATION IN CONDUITS

.1 Upstream side guardrails upper rails are used as conduits to carry the conductors to the lighting fixtures.

.2 Install the cables in conduits according the Manufacturer's recommendations.

.3 It is prohibited to pull out spliced cables in conduits.

.4 Install simultaneously all cables in the same conduit.

.5 To reduce the pulling tension, use CSA approved lubrificants and compatible with the exterior cable covering.

.6 After cable installation, block the conduit ends with a product design for conduit sealing.

.7 Terminate cables in accordance with Section 26 05 20 - Wire and Box Connectors - (0-1000 V).

.8 Cable color coding shall be according to electrical code and standards.

END OF SECTION

Electrical – Connectors and Terminations
Section 26 05 22

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Not used.

1.2 REFERENCE STANDARDS

.1 Canadian Standard Association (CSA)

.1 CSA C22.10, Québec Construction Code, Chapter V - Electricity.

.2 CSA C22.2 no. 41, Grounding and Bonding Equipment (Tri-National Standard with NMX-J-590-ANCE and UL 467).

.3 CSA C22.2 no. 65, Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE).

1.3 ACTION AND INFORMATION SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data.

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, operation limits and finishing.

PART 2 PRODUCTS

2.1 CONNECTORS AND CABLE TERMINALS

.1 Compression type wire connectors conform to CAN/CSA-C22.2 No.65, with current carrying parts of copper sized to fit copper conductors as required

.2 Connectors type KS are not allowed. Only use compression type wire connectors.

2.2 INSTALLATION

.1 If needed, bonding and grounding conform to CSA C22.2 n^{o} 41.

PART 3 EXECUTION

.1 Not used.

END OF SECTION

Electrical – Conduits, Conduit Fastening and Conduit Fittings
Section 26 05 34

PART 1 GENERAL

1.1 REFERENCE STANDARDS

.1 Canadian Standards Association (CSA International).

.1 CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.

.2 CSA C22.2 No. 45, Rigid Metal Conduit.

.3 CSA C22.2 No. 56, Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.

.4 CSA C22.2 No. 211.2, Rigid PVC (Unplasticized) Conduit

1.2 DOCUMENTS/SAMPLES TO BE SUBMITTED FOR APPROVAL/INFORMATION

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

.2 Product data: submit manufacturer's printed product literature, specifications and datasheets.

PART 2 PRODUCTS

2.1 CONDUITS

.1 Rigid metal conduit: to CSA C22.2 No. 45, galvanized steel threaded.

.2 Rigid pvc conduit: to CSA C22.2 No. 211.2.

.3 Flexible metal conduit: to CSA C22.2 No. 56, liquid-tight flexible metal

2.2 CONDUIT FASTENINGS

.1 One-hole steel strap to secure surface conduits 52 mm and smaller. Two-hole steel straps for conduits larger than 52 mm.

2.3 CONDUIT FITTINGS

.1 Fittings: to CAN/CSA C22.2 No. 18, manufactured for use with conduit specified. Coating: same as conduit.

.2 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.

.3 Set-screws are not acceptable.

2.4 FISH CORD

.1 Industrial type polypropylene, diameter equal or superior to 6 mm.

PART 3 EXECUTION

3.1 EXAMINATION

.1 As per manufacturer's instructions

.2 Check for conformity to manufacturer's requirements, recommendations and specification including all technical bulletins available and applicable related to storage and installation and to product data sheets.

3.2 INSTALLATION

.1 Unless otherwise indicated, use rigid galvanized steel conduits.

.2 Minimum conduit size for lighting and power circuits: 19 mm.

.3 Steel conduits shall be cold-bended; replace conduits if deformation during bending has reduce its diameter by at least 10 %.

.4 Mechanically bend steel conduits of 19 mm diameter.

.5 Use rigid PVC conduit underground, for the junction of existing conduits.

.6 Remove and replace blocked conduit sections; do not use liquids to clean out conduits.

.7 Dry conduits out before installing wire.

.8 Seal conduit ends after installing cables.

.9 Note that upstream side upper rails are used as conduits to carry conductors to lighting fixtures. All precautions allowed for conventional conduits are applicable.

END OF SECTION

Lighting Devices
Section 26 50 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 26 05 00 – Electricity – Common Work Results for Electrical.

.2 Section 26 05 20 – Wire and Box Connectors (0-1000 V)

.3 Section 26 05 21 – Wires and cables (0-1000 V)

.4 Section 26 05 22 – Connectors and Terminations

1.2 REFERENCE STANDARDS

.1 Canadian Standard Association (CSA)

1.3 DOCUMENTS / SUBMITTALS FOR APPROVAL / INFORMATION

.1 Data Sheets

.1 Submit the required data sheets as well as the manufacturer's instructions and documentation for baseboard heaters. The data sheets must indicate the characteristics of the products, the performance criteria, the dimensions, the limits and the finish.

PART 2 PRODUCT

2.1 LIGHTING FIXTURES

.1 Devices compliant with CSA

.2 Electrical Specifications 347 V, 10 kW, 3500 K (color)

.3 Designed for outdoor usage (IP65)

.4 Minimum durability: 50 000 hours

.5 Black casing with WL option (wet location) and anti-vandalism.

.6 Lens: Opal

.7 Length: around 12 inches

.8 Suggested model: VFP4 from Luminaire LED or equivalent approved.

PART 3 EXÉCUTION

3.1 INSTALLATION

.1 Install and connect the lighting fixture under the upper rail of the upstream side guardrails as indicated on drawings and according the Manufacturer’s recommendations

.2 The Contractor shall supply the fixation support permitting the lighting fixture installation with the required angle.

.3 The lighting fixtures shall be grounded with a 12 AWG green conductor. Connectors shall be compression type.

3.2 QUALITY CONTROL ON SITE

.1 Perform the tests in accordance with section 26 05 00 - Electricity – Common Work Results for Electrical.

.2 Ensure proper operation of lighting fixtures.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 14 13 – Soil Stripping and Stockpiling.

.2 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.3 Section 31 37 00 – Riprap.

1.2 REFERENCES

.1 ASTM International

.1 ASTM D4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.2 Ministère des Transports du Québec

.1 LC 21-067. Détermination de la densité et de l'absorption du gros granulat;

.2 LC 21-070. Détermination du pourcentage d'usure par attrition du gros granulat au moyen de l'appareil micro-Deval;

.3 LC 21-400. Détermination de la résistance à l'abrasion au moyen de l'appareil Los Angeles.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Allow continual sampling during production.

.2 Provide access to source and processed material for sampling.

.3 Install sampling facilities at discharge end of production conveyor, to allow for representative sampling of items being produced. Stop conveyor belt when requested by Pthe Departmental Representative to permit full cross section sampling.

.4 Provide front end loader or other suitable equipment including trained operator for stockpile sampling as necessary. Move samples to storage place as directed by the Departmental Representative.

.5 Supply new or clean sample bags or containers appropriate to contain aggregate materials.

.6 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

.7 Provide water, electric power and propane to the laboratory trailer at production site.

.4 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75 % of construction wastes were recycled or salvaged.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

.3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

.2 Rockfill and crushed stone or gravel must meet durability and hardness requirements.

.1 Table

Test	Grade	Standard	Requirements
Absorption		LC 21-067	≤ 1.5 %
Apparent Density		LC 21-067	≥ 2.55
Resistance to abrasion Los Angeles	B	LC 21-400	≤ 50 %
Resistance to abrasion Micro-Deval	F	LC 21-070	≤ 30 %

.3 Flat and elongated particles of coarse aggregate: to ASTM D4791.

.1 Particles with greater dimension exceeding 5 times lesser dimension.

.4 Type 2 material satisfying requirements of applicable section to be one of or blend of the following.

.1 Sand and gravel treated and/or screened and/or washed or crushed rock.

.5 Type 3 material satisfying requirements of applicable section to be one of or blend of the following.

.1 Crushed stone.

.6 Type 4 material satisfying requirements of applicable section to be one of or blend of the following.

.1 Blasted rock selected and/or treated.

2.2 SOURCE QUALITY CONTROL

.1 Inform the Departmental Representative of proposed source of aggregates and provide access for sampling 4 weeks minimum before starting production.

.2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.

.3 Advise the Departmental Representative 4 weeks minimum in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Not used.

3.2 PREPARATION

.1 Processing:

.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.

.1 Blending aggregates, if required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements, percentage of crushed particles, or particle shapes specified.

.2 Use methods and equipment approved in writing by the Departmental Representative.

.2 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.

.1 Use only equipment and material approved in writing by the Departmental Representative.

.3 Stockpiling:

.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by the Departmental Representative. Do not stockpile on completed pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet project schedules.

.3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.

.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by the Departmental Representative within 48 hours of rejection.

.7 Stockpile materials in uniform layers of thickness that doesn't exceed 3 m in thickness with a minimum horizontal clearance of 1 m between layers.

.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.9 Do not cone piles or spill material over edges of piles.

.10 Do not use conveying stackers.

.11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 – Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning.

.3 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.4 Leave any unused aggregates in neat compact stockpiles as directed by the Departmental Representative.

.5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.6 For temporary or permanent abandonment of aggregate source, restore source to condition meeting requirements of authority having jurisdiction.

.7 Restrict public access to temporary or permanently abandoned stockpiles by means acceptable to the Departmental Representative.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 05 16 – Aggregate Materials.

.2 Section 31 32 19.01 – Geosynthetics.

.3 Section 31 37 00 – Rip-Rap.

1.2 MEASUREMENT PROCEDURES

.1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C117-17, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-12, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) (600 kN-m/m^3).

.5 ASTM D4318-17, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.6 ASTM D4253-16, Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Bureau de normalisation du Québec

.1 BNQ 2501-025 2013 – Soils – Size Analysis of Inorganic Soils.

1.4 DEFINITIONS

.1 Excavation classes: two classes of excavation will be recognized; common excavation and rock excavation.

.1 Rock : solid material in excess of 1.00 m^3. Frozen material is not classified as rock.

.2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.

.2 Unclassified excavation: excavation of deposits of whatever character encountered in Work.

.3 Waste material: excavated material unsuitable for use in Work or surplus to requirements.

.4 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.

.5 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.

.6 Unsuitable materials:

.1 Weak, chemically unstable, and compressible materials.

.2 Frost susceptible materials:

.1 Fine grained soils with plasticity index less than 10 % when tested to ASTM D4318, and gradation within limits specified when tested to ASTM D422 and ASTM C136.

.2 Coarse grained soils containing more than 20 % by mass passing 0.075 mm sieve.

.7 Soil: materials in place prior to excavation.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality Control: in accordance with Section 01 45 00 - Quality Control:

.1 Submit condition survey of existing conditions as described in 1.8 – EXISTING CONDITIONS article of this Section.

.2 Submit for review by the Departmental Representative proposed dewatering and heave prevention methods as described in PART 3 of this Section.

.3 Submit to the Departmental Representative written notice at least 7 days prior to excavation work, to ensure cross sections are taken.

.4 Submit to the Departmental Representative written notice when bottom of excavation is reached.

.5 Submit to the Departmental Representative testing and inspection results and reports as described in PART 3 of this Section.

.3 Preconstruction Submittals:

.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.

.4 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.2 Inform the Departmental Representative at least 4 weeks prior to beginning Work, of proposed source of fill materials and provide access for sampling.

.3 Submit representative samples of fill types in sufficient quantity to perform specified tests.

.4 Ship samples prepaid to the Departmental Representative, in tightly closed containers to prevent contamination and exposure to elements.

1.6 QUALITY ASSURANCE

.1 Qualification Statement: in accordance with section 01 33 00 A – Submittal Procedures – Appendix A – Documents Required From the Contractor.

.2 Ensure quality control in accordance with Section 01 45 00 – Quality Control.

.3 Submit design and supporting data at least 2 weeks prior to beginning Work.

.4 Design and supporting data submitted to bear stamp and signature of qualified professional engineer registered or licensed in Province of Quebec, Canada.

.5 Keep design and supporting data on site.

.6 Engage services of qualified professional Engineer who is registered or licensed in Province of Quebec, Canada in which Work is to be carried out to design and inspect bracing works and underpinning required for Work.

.7 Do not use soil material until written report of soil test results are approved by the Departmental Representative.

1.7 HEALTH AND SAFERTY REQUIREMENTS

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

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

.2 The backfill and cutting management must be in accordance with Section 01 35 43 – Environmental Protection.

1.9 EXISTING CONDITIONS

.1 Examine available soil reports.

.2 Buried services:

.1 Before commencing work establish location of buried services on and adjacent to site.

.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.

.3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.

.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

.5 Prior to beginning excavation Work, notify applicable Departmental Representatives and authorities having jurisdiction to establish location and state of use of buried utilities and structures.

Departmental Representatives and authorities having jurisdiction to clearly mark such locations to prevent disturbance during Work.

.6 Confirm locations of buried utilities by careful test excavations.

.7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.8 Where utility lines or structures exist in area of excavation, obtain direction of Parks Canada Agency before removing. Costs for such Work to be paid by Parks Canada Agency.

.9 Record location of maintained, re-routed and abandoned underground lines.

.10 Confirm locations of recent excavations adjacent to area of excavation.

.3 Existing buildings and surface features:

.1 Conduct, with the Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.

.2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by the Departmental Representative.

PART 2 PRODUCTS

2.1 MATERIALS

.1 The different types of material used in the embankments are:

.1 Type 2: MG20;

.2 Type 3: MG80;

.3 Type 4A: Downstream riprap (Class A);

.4 Type 4B: Upstream riprap (Class B).

.2 General

.1 All materials used in embankments must be unfrozen and free of clinker, ash, sod, organic matter, snow, ice, waste or other undesirable materials.

.2 All materials placed in the embankments must have a well graded and continuous particle size distribution, without absence or excess of any fraction, within specified grain size limits.

.3 All materials shall consist of hard and durable particles, and the rock shall be unaltered, uncracked, hard and durable.

.4 Rockfill and crushed stone must meet durability and hardness requirements in accordance with Section 31 05 16 – Aggregate Materials.

.3 Types 2, 3 and 4 fill: properties to Section 31 05 16 – Aggregate Materials and the following requirements:

.1 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1and/or CAN/CGSB-8.2.

Table 2-1: Limits of Specified Gradations (original)

Sieve Designation	% passing	
	Type 2	Type 3
300 mm	-	100
100 mm	-	95-100
75 mm	-	80-100
50 mm	-	45-70
20 mm	100	28-50
10 mm	58-82	-
5 mm	-	12-28
2.5 mm	25-45	-
2.0 mm	-	9-24
1.25 mm	-	-
0.425 mm	11-22	2-11
0.315 mm	-	-
0.075 mm	0-8	0-10

.2 It may be tolerated that not more than 10% of the samples of each material give sieve analysis results outside the specified gradations, by a maximum of 3%, provided that the materials represented by these samples are well graded and well distributed throughout the embankment at the Departmental Representative satisfaction.

.4 Geotextiles: to Section 31 32 19.01 –Geosynthetics.

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures in accordance with Section 01 35 43 – Environmental Protection.

3.2 SITE PREPARATION

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

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/PROTECTION

.1 Protect existing features in accordance with Section 01 14 00 – Work Restrictions.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to the Departmental Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.4 STRIPPING OF TOPSOIL

.1 Not used.

3.5 STOCKPILING

.1 Stockpile fill materials in accordance with Section 01 35 43 – Environmental Protection.

3.6 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 29.06 – Health and Safety Requirements.

.1 Where conditions are unstable, Departmental Representative to verify and advise methods.

.2 Construct temporary Works to depths, heights and locations as approved by the Departmental Representative.

.3 Perform the following operations during backfill if sheet piles and shoring works are used:

.1 Unless otherwise indicated or directed by the Departmental Representative, remove sheet piles and shoring from excavations.

.2 Do not remove bracing until backfilling has reached respective levels of such bracing.

.3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheet piles.

.4 When sheet piles is required to remain in place, cut off tops at elevations as indicated.

.4 Cofferdams must be exempt of particles with a diameter less than 0.075 mm.

.5 Upon completion of substructure construction:

.1 Remove cofferdams, shoring and bracing.

.2 Remove excess materials from site and restore watercourses as indicated and directed by the Departmental Representative.

3.7 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations and backfill areas free of water while Work is in progress.

.2 Submit to the Departmental Representative details of proposed dewatering or heave prevention methods, including, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.

.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 - Environmental Protection.

3.8 EXCAVATION

.1 Advise the Departmental Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as directed by the Departmental Representative.

.3 Excavation of frozen materials is forbidden.

.4 Excavation must not interfere with bearing capacity of adjacent foundations.

.5 Do not disturb soil within branch spread of trees or shrubs that are to remain.

.6 For trench excavation, unless otherwise authorized by Parks Canada Agency in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 2 m (measured at the base) at end of day's operation.

.7 Keep excavated and stockpiled materials at safe distance away from edge of trench as directed by the Departmental Representative.

.8 Restrict vehicle operations directly adjacent to open trenches.

.9 Dispose of surplus and unsuitable excavated material off site.

.10 Do not obstruct flow of surface drainage or natural watercourses.

.11 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.12 Notify the Departmental Representative when bottom of excavation is reached.

.13 Obtain the Departmental Representative approval of completed excavation.

.14 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by the Departmental Representative.

.15 Correct unauthorized over-excavation with material approved by the Departmental Representative.

.16 Hand trim, make firm and remove loose material and debris from excavations.

.1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

.17 Install geotextiles in accordance with Section 31 32 19.01 - Geosynthetics.

3.9 COMPACTION

.1 The Contractor shall use compaction methods and equipment suitable for the construction of embankments according to the dimensions indicated in the drawings.

.2 The Contractor is responsible for determining the type of compaction machine and the thickness of the layers to achieve the degrees of compactness specified in this section.

.3 Compaction densities are percentages of maximum densities obtained from ASTM D698 and ASTM D4253.

.1 Type 2 material must be compacted to 95% of ASTM D698. The layers must have a thickness of at most 150 mm after compaction.

.2 Type 3 material must be placed in a way to provide adequate support to the overlying Type 4B material without damaging any underlying geomembrane or geotextile.

.3 Dropping of stones should be at a height low enough to prevent damage to geotextiles.

.1 The Contractor must replace damaged geotextiles in accordance with Section 31 32 19.01 – Geosynthetics.

.4 Refer to Section 31 37 00 – Rip Rap for Type 4 material placement requirements.

3.10 BEDDING AND SURROUND OF UNDERGROUND SERVICES

.1 Place and compact granular material for bedding and surround of underground services as indicated.

.2 Place bedding and surround material in unfrozen condition.

3.11 FILL CONSTRUCTION

.1 Do not proceed with fill construction operations until completion of following:

.1 The Departmental Representative has inspected and approved foundation or layer of material that will be covered.

.2 The Departmental Representative has inspected and approved of construction below finish grade.

.3 Inspection, testing, approval, and recording location of underground utilities.

.4 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place fill material in uniform layers not exceeding the specified thickness in article 3.9 up to grades indicated. Compact each layer before placing succeeding layer.

.1 Place bedding and surround material as specified elsewhere.

.2 Place layers simultaneously on both sides of installed Work to equalize loading. Difference not to exceed 1 m.

.5 If approved by Parks Canada Agency, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Parks Canada Agency.

3.12 PLACING OF TOPSOIL

.1 Not used.

3.13 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 19 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by the Departmental Representative.

.2 Replace topsoil and sod as directed by the Departmental Representative.

.3 Clean and reinstate areas affected by Work as directed by the Departmental Representative.

3.14 CONTROL TESTS

.1 The following table presents tests on backfill materials and minimum frequencies.

.2 Table

Test	Reference	Type 2		Type 3	
		Vol.	Per.	Vol.	Per.
Grain Size Distribution	Random Fill (CAN/BNQ 2501-025)	---	---	1/2T	---
	Fraction < 80 mm (CAN/BNQ 2501-025)	1/T(1)	1/D	---	---
Sedimentation	Fraction < 0,080 mm (CAN/BNQ 2501-025)	---	---	---	---
Water Content	CAN/BNQ 2501-025	--	---	---	---
Compaction	Normal Proctor Test method C (ASTM D698)	---	OR	---	---
	Max. Density (vibratory table) (ASTM D4253)	1/T(1)	1/S	---	---
In-situ Density	Nuclear Methods (ASTM D6938-8a)	1/T(1)	1/S	---	---

Legend : Vol. : Volume Per. : Period T : 1000 m3 OR: On Parks Canada Agency Request
S : Work Shift D :Day W : Week
Note : (1) Subject to revision depending on the scope of work.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

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

1.2 MEASUREMENT AND PAYMENT

.1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

1.3 REFERENCES

.1 ASTM International

.1 ASTM A123/A123M-17, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.2 ASTM D1004-13, Standard Test Method for Tear Resistance (Graves Tear) of Plastic Film and Sheeting.

.3 ASTM D4355/D4355M-14 (2018), Standard Test Method for Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in a Xenon Arc-Type Apparatus.

.4 ASTM D4491-99a (2014), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

.5 ASTM D4533/D4533M-15, Standard Test Method for Trapezoid Tearing Strength of Geotextiles.

.6 ASTM D4632/D4632M-15a, Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.

.7 ASTM D4716-14, Standard Test Method for Determining the (In-Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.

.8 ASTM D4751-16, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.9 ASTM D4833/D4833M-17 (2020), Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.

.10 ASTM D5199-12 (2019), Standard Test Method for Measuring Nominal Thickness of Geosynthetics.

.11 ASTM D5885/D5885M-20, Standard Test Method for Oxidative Induction Time of Polyolefin Geosynthetics by High-Pressure Differential Scanning Calorimetry.

.12 ASTM D6241-14, Standard Test Method for Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

.13 ASTM D6693/D6693M-20, Standard Test Method for Determining Tensile Properties of Nonreinforced Polyethylene and Nonreinforced Flexible Polypropylene Geomembranes.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-4.2 No. 11.2-2004, Textile Test Methods - Bursting Strength - Ball Burst Test (Extension of September 1989).

.2 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.

.1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.

.2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.

.3 No.4-M85, Methods of Testing Geosynthetics – Normal Water Permeability Under No Compressive Load.

.4 No.6.1-93, Methods of Testing Geotextiles and Geomembranes - Bursting Strength of Geotextiles Under No Compressive Load.

.5 No.7.3-92, Methods of Testing Geotextiles and Geomembranes - Grab Tensile Test for Geotextiles.

.6 No. 10-94, Methods of Testing Geosynthetics - Geotextiles - Filtration Opening Size.

.3 CSA International

.1 CSA G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:

.1 Submit following samples 4 weeks prior to beginning Work.

.1 Minimum length of 2 m of roll width of geotextile.

.2 Methods of geotextiles seals and overlaps.

.3 Minimum length of 2 m of roll width of geomembrane.

.4 Seam of a minimum length of 1 m with portions of geomembranes of at least 300 mm on both sides.

.4 Test and Evaluation Reports:

.1 Submit copies of mill test data and certificate at least 4 weeks prior to start of Work.

.5 Sustainable Design Submittals:

.1 Construction Waste Management in accordance with Sections 01 74 19 – Construction/Demolition Waste Management and Disposal.

1.5 QUALITY ASSURANCE

.1 Verify quality of compound and geomembranes composition in concordance with manufacturer recommendations.

.2 At the beginning of each shift or every four (4) hours intervals if welding operations are interrupted, verify mechanical strength and peel strength of welds for each device used during the day.

.1 Test at least two (2) samples taken on excess length portions of geomembranes to avoid any damage to installed panel.

.3 If seam is unsatisfactory, repeat process on additional sample.

.1 If additional test is rejected, the material subjected to testing must not be used for further operations until two (2) consecutive tests are successful.

.4 Verify the whole length of seams using non-destructive methods such as the vacuum chamber test or air infiltration test.

.1 Use vacuum chamber with a glass observation panel and hermetic contact with the seam. Once the vacuum chamber sealed against the seam and partially filled with water, apply a suction of 17.2 kPa. The seam is deemed unsatisfactory if air bubbles can be seen in the water.

.2 Using an air jet, apply a pressure of 343 kPa toward the seam. The seam is deemed unsatisfactory if bulging or uplifting of any part of the geomembrane is observed.

.5 Following every shift, provide the Departmental Representative with results of non-destructive tests performed during the shift, including a report on any remedial work executed.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect geotextiles and geomembranes from direct sunlight and UV rays.

.3 Replace defective or damaged materials with new.

.3 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 GEOTEXTILES

.1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.

.2 Geotextile: physical and mechanical properties:

.1 Thickness: to CAN/CGSB-148.1, No.3, minimum 3.5 mm.

.2 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 400 g/m^2.

.3 Tensile strength and elongation (in any principal direction): according to ASTM D4533.

.1 Tensile strength: minimum 1 400 N, wet condition, according to ASTM D4632.

.2 Elongation at break: 50-105%, according to ASTM D4632.

.3 Trapezoid tear strength: minimum 500 N, according to ASTM 4533.

.4 CBR puncture: 3 500 N, according to ASTM D6241.

.5 UV resistance: 50%/500h, according to ASTM D4355

.3 Geotextile: hydraulic properties:

.1 Filtration opening size (FOS): 45-150 micrometres to CAN/CGSB-148.1 No.10.

.2 Permeability: to CAN/CGSB-148.1, No.4, minimum 0.250 cm/s.

.3 Permittivity: to ASTM D4491, minimum 0.70 per second.

.4 Securing pins and washers: to CSA G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m2 to ASTM A123/A123M.

.5 Factory seams: sewn in accordance with manufacturer's recommendations.

.6 Thread for sewn seams: equal or better resistance to chemical and biological degradation than geotextile.

2.2 GEOMEMBRANES

.1 Geomembrane: smooth sheets of extruded synthetic material, supplied in rolls.

.2 Composed of high density polyethylene resin with incorporated inhibitors ensuring better resistance to heat and UV rays for a 60 day period.

.3 Geomembrane: physical and mechanical properties

.1 Thickness : minimum 1.5 mm, according to ASTM D5199.

.2 Tensile strength and elongation (in any principal direction):

.1 Tensile strength: at least 35 kN/m, wet condition, according to ASTM D6693.

.2 Elongation at break: 700 %, according to ASTM D6693.

.3 Tear strength: at least 150 N, according to ASTM D1004.

.3 Puncture: minimum 500 N, according to ASTM D4833.

.4 UV resistance: at least 50% for 1600h, according ASTM D5885.

.4 Securing pins and washers: to CSA G40.21, Grade 300W, hot-dipped galvanized with minimum zinc coating of 600 g/m2 to ASTM A123/A123M.

.5 Seams: welded in accordance with manufacturer recommendations.

.6 Physical properties of compound used for welding are to be the same than that of the geomembrane.

PART 3 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geosynthetic material installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Geotextiles

.1 Place geotextile material by unrolling onto graded slope surface.

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.4 Overlap each successive strip of geotextile by a minimum of 300 mm over previously laid strip. The upstream strip must lie on the downstream strip.

.5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.6 After geotextile installation, cover with overlying material within 4 hours of placement.

.7 Replace damaged or deteriorated geotextile to approval of Departmental Representative.

.8 Place and compact embankments in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

.2 Geomembrane

.1 Keep work areas and surfaces to be covered with geomembrane exempt from water and snow.

.2 Consolidate very soft surfaces prior to installation of geomembrane and according to guidelines from Departmental Representative.

.3 Do not install or weld panels if ambient temperature is lower than -5 Celsius or higher than 40 Celsius, if it snows, rains or there are high winds or if high humidity level is observed (e.g., fog or dew).

.4 On prepared surfaces, install geomembranes by unrolling the panel along direction of the flow and weld seams in accordance with the manufacturer’s recommendations. If possible, avoid folds,

scratches, pinch-points or any irregularities of newly installed geomembranes and damages to support layer.

.5 Ensure that existing geomembrane to which new geomembrane must be welded is free of dirt, water or any other substance, and of any damage such as folds, cracks or punctures (partial or complete) on a width sufficient to complete the seam according to manufacturer's recommendations.

.6 Prevent movement and potential damage to newly installed geomembranes prior to, during and following placement of overlying fill material.

.7 Keep seams clean and exempt from humidity, dust, debris and foreign substances.

.8 In accordance with requirements listed in PART 2, perform seams with excess geomembrane pieces and test the quality of the weld to verify if criteria are met.

.9 As work progresses, perform non-destructive tests on seams welded on site. Perform test on the whole length of the seams. For inadequate seams, perfom remedial work and repeat non-destructive tests on the entire length of the unsatisfactory portion until tests indicate that requirements are met.

.10 Repair tears and minor punctures with round or oval pieces of the same origin than the geomembrane. Ensure that the patches extend at least 100 mm on all sides of damaged areas.

.11 After geomembrane installation, cover with overlying material within 4 hours of placement.

.12 Replace damaged or deteriorated geotextile to approval of Departmental Representative

.13 Place and compact embankments in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.

3.3 CLEANING

.1 Progress Cleaning: clean in accordance with Section [01 74 00 - Cleaning].

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 – Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

.1 Vehicular traffic not permitted directly on geotextiles.

END OF SECTION

Earthwork - Rip-Rap
Section 31 37 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 05 16 – Aggregate Materials.

.2 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.2 MEASUREMENT PROCEDURES

.1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 ASTM D422-63, Standard Test Method for Particle-Size Analysis of Soils.

.3 ASTM D 4791-10, Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate.

.2 Ministère des Transports du Québec

.1 LC 21-067. Détermination de la densité et de l'absorption du gros granulat;

.2 LC 21-070. Détermination du pourcentage d'usure par attrition du gros granulat au moyen de l'appareil micro-Deval;

.3 LC 21-400. Détermination de la résistance à l'abrasion au moyen de l'appareil Los Angeles.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit required documents and samples in accordance with Section 01 33 00 – Submittal Procedures.

.2 At least four (4) weeks prior to the start of work, notify the Departmental Representative of the proposed source of supply for the pier, and provide access to the latter for sampling.

.3 At least four (4) weeks prior to start of work submit laboratory test results demonstrating material conformance to hardness and durability requirements specified in this section.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 19 – Construction/Demolition Waste Management and Disposal.

.2 Instead of transporting unused granular materials to a landfill, transport them to the quarry in the area for re-use, subject to the approval of the Departmental Representative.

PART 2 PRODUCTS

2.1 STONE

.1 The stones used for Type 4 rip-rap must meet the following requirements:

.1 Hard, durable angular rock of quality that will not disintegrate on exposure to water or weathering action. They must meet the requirements of durability and hardness in accordance with Section 31 05 16 – Aggregate Materials.

.2 Rocks must be free from seams, cracks or other structural defects.

.3 Rocks that have shale seams or that are thinly bedded are undesirable.

.4 Rocks must be free of overburden, spoil, organic and other deleterious materials.

.5 Individual rocks shall have a thickness greater than one-third their length.

.6 Gradations to be within limits specified:

.1 Table: Specified Gradation Limits for Type 4 riprap (Class A).

Nominal size of the blocks (D)	Dimension (mm)
D_{min}	150
D_{50}	275-325
D_{100}	445-475

.2 Table: Specified Gradation Limits for Type 4 riprap (Class B).

Nominal size of the blocks (D)	Dimension (mm)
D_{min}	50
D_{50}	100
D_{max}	130-150

.7 No nominal size block smaller than the specified minimum nominal size is permitted.

.2 The Departmental Representative may reject any stone from quarry that contains too much fines, dust or other harmful products based on a visual inspection.

PART 3 EXECUTION

3.1 PLACING

.1 Prior to placement of any riprap, prepare a representative sample of at least 6 stones ranging from the minimum to the maximum size of the riprap to be placed. The stones must be placed in a row in ascending order including non-standard dimensions. The nominal dimension of each stone must be inscribed on their surface. The sample is to be approved by the Departmental Representative and placed in the vicinity of the work easily accessible for visual calibration for the duration of the riprap placement.

.2 Prior to placing rip-rap stones, ensure the surface is constructed to the lines, elevations and dimensions on drawings and in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.

.3 Place stones in manner approved by Departmental Representative to secure surface and create a stable mass.

.4 After the arrangement and stability of the blocks of Type 4 material were checked, grade the area to be rip-rapped to a uniform and even surface.

.5 Place rip-rap to thickness and details as indicated.

.6 Mechanical placing :

.1 It is forbidden to dump Type 4 material on the slope.

.2 Type 4 material must be placed using the bucket of an excavator.

.3 Drop height should not be higher than 0.6 m and must not damage the underlying material, geomembrane or geotextile.

.4 Use excavator bucket to press and secure riprap stones to ensure good contact or interlocking between the stones and that they are stable.

.5 Finish surface evenly, free of large openings and neat in appearance.

.6 No specified degree of compaction is required for rip-rap.

END OF SECTION

Appendix A – Pictures

Appendix B – Template for the Environmental Protection Plan (EPP)

Company logo

Project Name

Location

Environmental protection plan (EPP)Project

Date

Contractor name

Table of content

Document modifications follow-up

Modification number	Date	Author(s)	Brief modification description
1.0	[yyyy-mm-dd]	[Name of author]	Document Creation.

EPP Objective

An Environmental Protection Plan (EPP) is a document that describes site-specific environmental protection measures and responsibilities during the implementation of a project. An EPP is designed to ensure that the environmental mitigation commitments and measures outlined in the specifications are properly understood and implemented by the Contractor. The EPP must contain specific and direct guidelines to achieve the targeted environmental outcomes in the mitigation measures.

The "ENVIRONMENTAL PROTECTION" section of the quotation contains a non-exhaustive list of indications on the EPP. This list may include, for example, the following:

- The Contractor must submit an Environmental Protection Plan to the Government Representative for review and approval prior to the commencement of construction activities or the delivery of materials and equipment to the site;
- The plan should provide a comprehensive overview of known or potential environmental problems to be addressed during construction and of applicable safeguards to mitigate environmental impacts;
- The actions included in the environmental protection plan must be presented per a level of detail which agrees with the environmental problems and with the construction work to be carried out.

Environmental Protection Plan (EPP)

*Please insert a nomenclature into a subsection, ex 1.1, 1.2, 1.3, etc.

1. Contact Information

The objective of this section is to identify the persons responsible for the implementation of the EPP.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- The names of the persons responsible for ensuring compliance with the plan;
- The names and skills of the persons responsible for the exit signs for residual hazardous materials to be evacuated from the site.

Specifically, this section should include, but is not limited to:

- The name and contact information of the Contractor's representative responsible for the implementation of the EPP;
- The names of Parks Canada staff involved in the environmental component of the project;
- The names of other project contacts with key environmental responsibilities;
- Environmental responsibility of each stakeholder;
    - An organizational chart of the Contractor and the communication chain.

1. Worker awareness of EPP

The objective of this section is to describe the Entrepreneur's strategy to ensure that its staff is aware of the content of the EPP, is aware of the environmental issues at the site of work and is adequately trained in the implementation of the EPP.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- The names and qualifications of the persons responsible for the training of construction site personnel;
- A description of the training program for personnel assigned to the protection of the environment.

Specifically, this section should include, but is not limited to:

- Strategy for training workers prior to work;
- The EPP communication strategy for workers, for example:
- Review of environmental issues and measures at start-up and construction meetings;
    - Discussion of the environmental aspect in daily work planning meetings

2. Environmental Regulatory Framework

Include in this section a list of environmental notices, permits, approvals and approvals received prior to construction. A copy of these documents must be at all times at the site.

The main environmental restrictions and requirements outlined in these documents are to be found in this section.

Any other regulatory compliance measures affecting or restricting the construction project (ex critical periods for wildlife protection) should also be included in this section.

3. Erosion and sedimentation control

The purpose of this section is to develop an erosion and sediment control plan for all periods of construction and reclamation. This plan must be adapted to the scope of the project and the associated risks. The plan must define concretely the means and techniques used to control the sediments and the location of the facilities.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- *A plan for the prevention of erosion and sediment transport, indicating the measures to be implemented, including monitoring of work and reporting to verify compliance with federal laws and regulations, Provincial and municipal governments.*
- *Traffic control plans, including measures to reduce the erosion of temporary road platforms by the movement of construction vehicles, particularly in rainy weather. These plans must include measures to reduce the transport of materials on public roads by vehicles or runoff.*

Specifically, this section should include, but is not limited to:

- Identification of areas at risk (ex watercourses, wetlands, steep slopes, etc.);
- Erosion prevention procedures (ex timing of project implementation, minimization of site area to the minimum required, management of the area under construction, land cover measures);

- Sediment control measures (ex sediment barriers, filter berm, sediment traps, etc.), including the usual specifications and drawings of sediment control structures (may be included in the annex);
- Detailed work plans for aquatic structures, including site isolation and project timelines;
- Water management plans, including on-site controls, equipment, and proposed drainage areas;
- Areas where erosion and sediment control measures are applied (indicate on the plan in Appendix 1);
- Monitoring of control measures, preventive measures, and corrective measures (ex repairs);
- Removal of non-biodegradable materials when the area is stabilized.
    - Any other requirements specified in the specification and the mitigation table for erosion and sediment control.

4. Procedure for refueling and maintenance of equipment

The purpose of this section is to identify measures to protect the environment during maintenance and refueling of machinery and equipment. Planned supply areas should be identified on the mobilization plan in Appendix 1.

5. Wastewater, Stormwater and Pump Water Management Plan

The purpose of this section is to define on-site water management, including wastewater, storm water inside and outside the site, and pumping water (ex, drying a work area or keep dry excavations).

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A run-off and leach management plan, indicating the measures that will be implemented to prevent any discharge of the water coming from the site into the surrounding aquatic environment;
- A wastewater management plan, indicating the methods and procedures to be used for the management or disposal of wastewater directly from construction activities, eg water used for concrete curing, Cleaning / discharging, grounding, disinfection, hydrostatic testing and rinsing of pipelines.

More specifically, this section should include, but is not limited to:

- Pre-discharge sites approved by Parks Canada;
- Methods of confinement and recovery of wastewater from the site (eg cleaning water from concrete surfaces, cleaning water from concrete pumps, runoff water, etc.);
- Water treatment methods, if required;
- Control of turbidity in the aquatic environment;

- Methods of verifying compliance with applicable quality criteria for water discharged into the aquatic environment;
- Any other requirements specified in the estimate and the mitigation measures table for on-site water management.

6. Excavated soil management plan

This section is complementary to section 4 on erosion and sediment control. It aims to detail temporary storage measures for excavated soil during the work, contaminated soil management methods, where appropriate, and protection of the environment during the period of soil disturbance.

More specifically, this section should include, but is not limited to:

- Temporary storage areas (indicate in the mobilization plan in Appendix 1);
- Methods for stabilizing slopes and disturbed soils;
- Methods for managing soils during temporary storage (excavated soil to be reused and soils disposed off-site);
- The name of the center (s) to which the contaminated soil will be sent, if applicable;
- Details on the concrete implementation of the measures specified in the estimate for contaminated soil management, where applicable;
- Any other requirements specified in the specification and the mitigation table for soil and excavation management.

7. Vegetation protection

The objective of this section is to indicate the means that will be put in place to protect the vegetation on the site and outside the site near taxiways and access roads, to plan for the management of undesirable species, and specify the trees and shrubs to be felled or pruned for the purposes of the work. Any intervention on vegetation must be validated and authorized by Parks Canada.

More specifically, this section should include, but is not limited to:

- Measures to manage irritant species and invasive alien species (ex, phragmite), including methods of cleaning machinery and means of disposing of plant residues;
- Measures to protect trees and shrubs against damage and disturbance caused by the work;
- Identification and location of trees to be felled and pruned, previously approved by Parks Canada;

- If required, a pesticide treatment plan approved by the Parks Canada process;
- Any other requirements specified in the specification and the mitigation table for vegetation management.

8. Residual Materials and Hazardous Materials Management Plan

Indicate in this section waste management measures, including hazardous and non-hazardous residual materials. This section should also include measures for the storage and handling of hazardous materials used on site.

The " CONSTRUCTION WASTE / DEMOLITION MANAGEMENT AND DISPOSAL " section of the estimate contains a non-exhaustive list of waste management and waste reduction measures. This list may include, for example, the following:

- Before starting work, meet with the Government Representative to review the waste management objectives and waste reduction plan for the construction, renovation and demolition (CRD) waste generated by the project.
- The waste management objective is to reduce as much as possible the total flow of construction / demolition waste to landfills.
- Provide the Government Representative with documents certifying that comprehensive measures and procedures for waste management, recycling, reuse / reuse of recyclable and reusable / re-employable materials have been implemented.
- Minimize the amount of non-hazardous solid waste generated by the work; Maximize the reduction at source, reuse / reuse and recycling of solid waste produced by CRD activities.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A plan for the disposal of non-hazardous residual materials, hazardous or special residual materials including methods and sites for the disposal of solid waste and debris from clearing.
- A plan for the prevention of contamination indicating the potentially hazardous substances to be used on the site, measures to prevent the substances being suspended in the air or introduced into the soil, as well as the details of the measurements that will be taken to ensure that the storage and handling of these substances are in compliance with federal, provincial and municipal laws and regulations.

This section should include, but is not limited to:

- Waste management measures, including hazardous and non-hazardous waste;
- Measures for the storage and handling of hazardous materials used on site;
- Container and hazardous material shelter locations (indicate in the mobilization plan in Appendix 1);
- The procedure for the management and disposal of concrete surplus from concrete pumps;
- Any other requirements specified in the specification and the mitigation measures table for the management of residual materials and hazardous materials.

9. Protection of wildlife

Indicate in this section the requirements specified in the estimate and the table of mitigation measures to protect terrestrial, aquatic, and avian wildlife.

10. Protection of aquatic environments

The purpose of this section is to identify the means to meet the requirements of the estimate and the mitigation table to protect aquatic environments (rivers, canals, wetlands, etc.). Among other things, indicate ways of preventing the dispersal of invasive exotic species (ex zebra mussels).

11. Dust and emission control

Indicate in this section the requirements specified in the specification and the table of mitigation measures that aim to minimize emissions of fine particulate matter and greenhouse gases into the air.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A plan for the prevention of air pollution, specifying measures to retain dust, debris, materials and residual materials inside the site.

12. Noise control

Indicate in this section the requirements outlined in the quote and the table of mitigation measures to minimize noise and inconvenience to site visitors and area residents as appropriate.

13. Modalities of restoration of the site at the end of the works

The objective of this section is to specify the planned restoration measures at the end of the work.

14. Emergency Response and Environmental Prevention

This section should specify steps for emergency response, particularly in the case of a spill of oil or other hazardous materials.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- A spill contingency plan that includes procedures to be followed, instructions to be followed and reports to be produced in the event of an unpredictable spill of a controlled substance.

Specifically, this section should include, but is not limited to:

- List of products and materials considered or defined as hazardous or toxic to the environment. These products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, hot-melt rubber membrane materials, bituminous cement, sand blasting agents, paint, solvents, and hydrocarbons;
- Equipment required on site;
- The contents and location of on-site recovery kits;
- Procedures for refueling and storing fuel;
- Spill prevention procedures (containment and storage of materials, safety, handling, use and disposal of empty containers, surplus products or waste generated by the application of these products in accordance with federal and provincial force);
- The spill response procedure (containment, cleaning, disposal of contaminated materials, etc.);
- An Incident Report Form to report spills (if included as an appendix, refer to them here);
- An up-to-date contact list for emergency response (Parks Canada, Environment Canada, Coast Guard, etc.), including information required to report spills.
- A fire emergency response plan;
- Any other requirements specified in the specification and the mitigation measures table for the management of spills and environmental emergencies.

Annexe 1. Mobilization plan

This schedule must include a plan identifying all elements that can be located in relation to environmental issues and the protection of the environment in the mobilization area and the machinery lanes.

The "ENVIRONMENTAL PROTECTION" section of the estimate contains a non-exhaustive list of the elements to be contained in an EPP. This list may include, for example, the following:

- Drawings showing the location of temporary excavations or site paths in embankments, materials, constructions, sanitary installations, deposits of surplus materials or contaminated materials; The drawings illustrating the methods that will be used to control runoff and to confine the materials to the site.
- A plan of the work area showing the activities planned in each part of the works area and indicating the areas of restricted use as well as the prohibited areas of use. This plan shall include measures to mark the boundaries of usable areas and methods of protection of the elements within authorized work areas to be preserved.

Specifically, this section should include, but is not limited to:

- Location of trees to be felled and trees to be protected (tree felling must be approved in advance by Parks Canada);
- Excavation areas;
- Temporary lanes and access;
- The location of temporary facilities (ex, platforms, cofferdams, etc.);
- Storage areas for excavated soils and other stacked materials, where applicable;
- Storage areas for building materials and debris;
- Location of erosion prevention equipment (ex, sediment barrier);
- Location of maintenance and refueling areas for machinery;
- Location of hazardous material shelters and waste containers;
- Location of oil recovery kits;
- The location of the confined enclosure for concrete surplus, where applicable;
- Location of water treatment facilities, where applicable (settling pond, etc.);
- Identified sites for the discharge of water into the environment.
- Etc.

Annexe 2. Environmental surveillance plan

Include a periodic monitoring report that captures the main measures of each section of the EPP to systematically check on their implementation and their proper functioning.

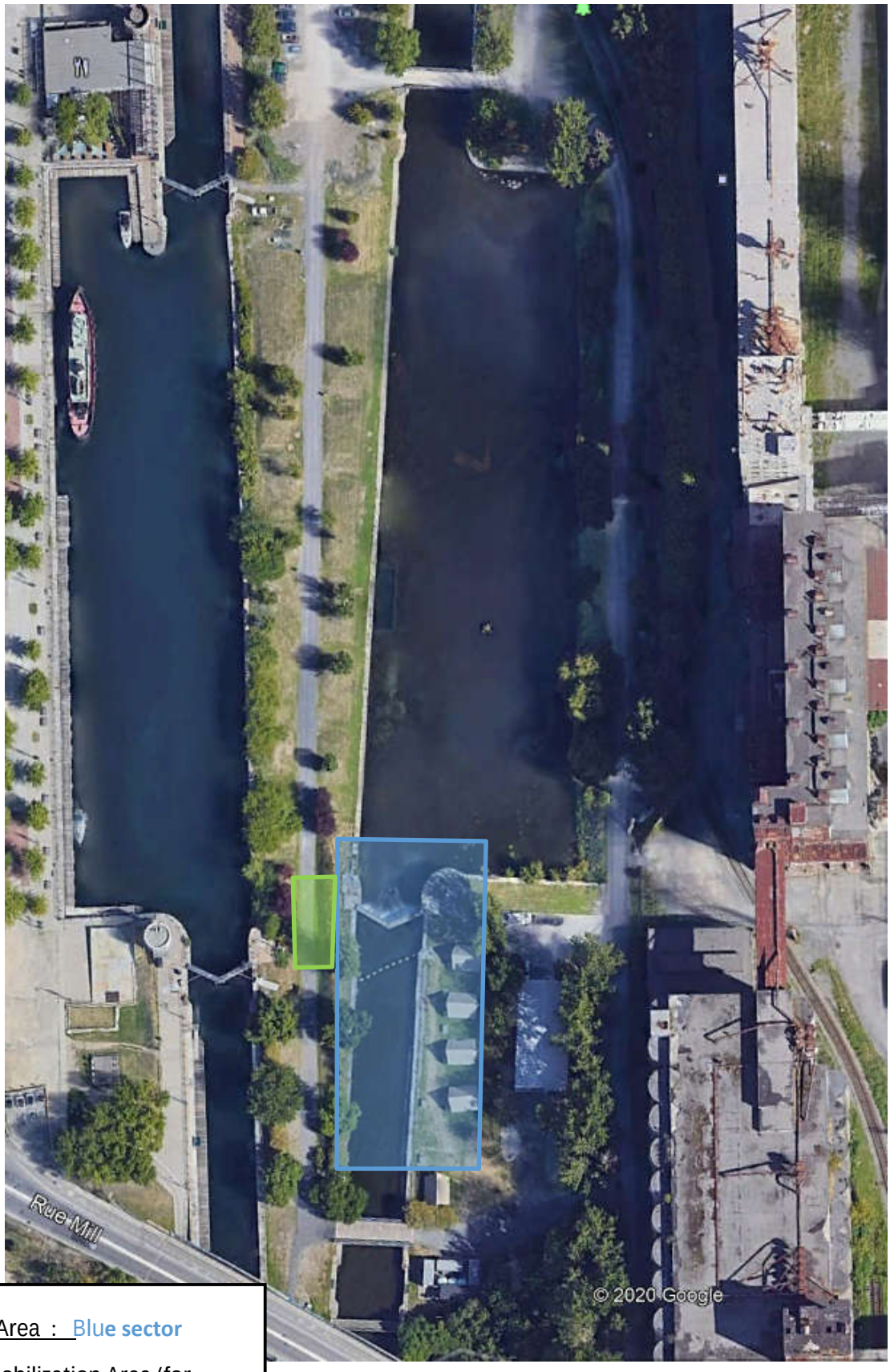
Additional Annexes

Add annexes to include the following:

- Material Safety Data Sheets;
- Data sheets on sediment containment methods (ex sediment barrier) or other specific equipment related to the environment used on the site;
- Management of nonconformities;
- Relevant shop drawings and drawings.

Appendix C – Mobilization Areas

CLAC 1452 – Spillway **2 - Mobilization Areas**



Mobilization Area : Blue sector

Temporary Mobilization Area (for electrical hook-up): Green sector

Appendix D – Fiche technique d'un poteau de garde-corps_CL-14-121 (Fiche Poteaux 3 lisses)

FICHE TECHNIQUE

COMPOSANTE : Poteau de garde-corps
QUANTITE REQUISE : 70
CARACTÉRISTIQUES : Coulé d' une seule pièce
ÉPAISSEUR : Non disponible
POIDS : 66 livres

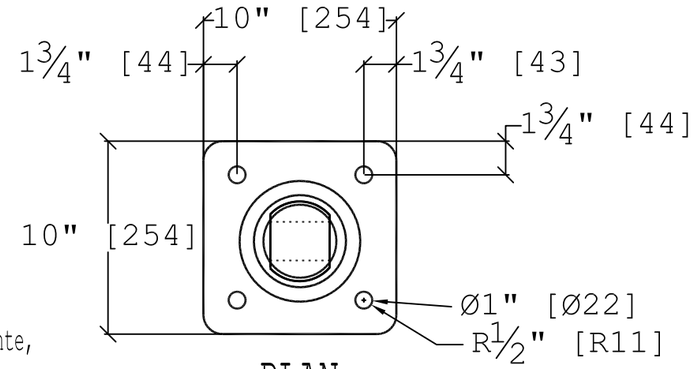
MOULE EXISTANT FOURNI PAR PARCS CANADA : L'entrepreneur doit aller le récupérer à l'adresse suivante, 19, rue de Chantal à Pont Rouge, QC G0A 2X0
A la fin des travaux, le retourner avec la livraison des poteaux

MATÉRIAUX : Fonte grise ordinaire, classe 30, répondant aux normes ASTM A-48-76 et coulée d' une seule pièce.

PEINTURE EN USINE :
- Nettoyage au jet d' acier (la surface nettoyée doit être recouverte d' une couche d' apprêt dans un délai de quatre (4) heures après le nettoyage) .
- Couche d' apprêt : (moins de quatre (4) heures après le nettoyage). La couche d' apprêt est composée de ¨ Interchromate ¨ no 72/019 pour une partie no 99/200 (spécification 1GP121, suivie, d' accélérateur dans un délai de moins de douze (12) heures, par l' application d' une couche d' intermédiaire .
Peinture internationale (Canada) Limitée
- Couche intermédiaire (moins de douze (12) heures après la couche d' apprêt) : Chromate primer rouge no 729041, spécification 1GP40.
- Une première couche de finition (appliquée en usine) : émail industiel Interkote no 30/021, spécification 1GP61.
- Une deuxième couche de finition sera appliquée par d' autre sur le terrain.
L' application des couches de peinture devra se faire à l' intérieur des normes de température et d' humidité exigées par le manufacturier.

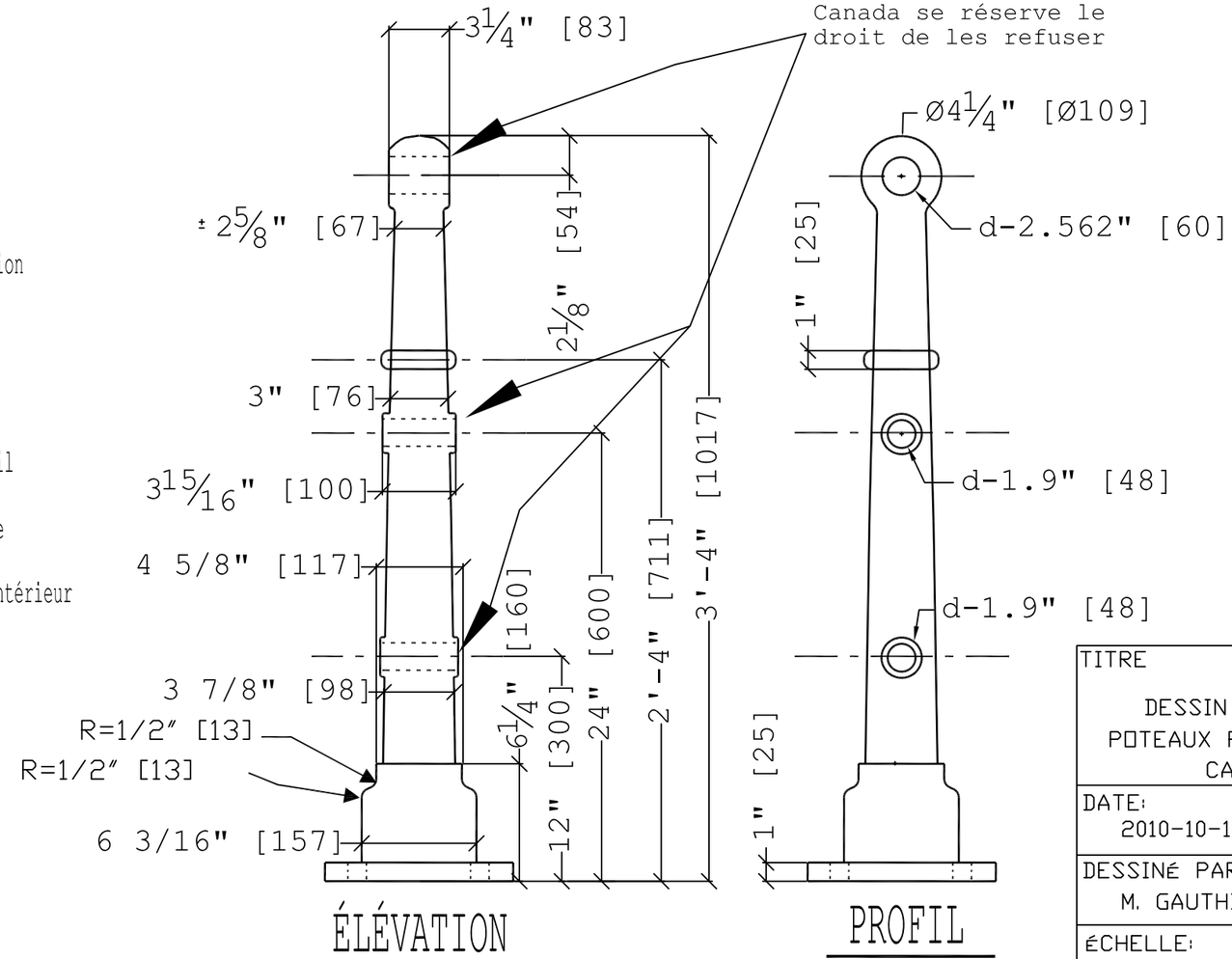
TRANSPORT : Le fournisseur devra prendre toutes les précautions d' emballage qu' il jugera à propos pour protéger les poteaux et le moule jusqu' à leur destination et il devra assumer, s' il y a lieu, les frais de réparations au fini de la peinture et ce, à la satisfaction de Parcs Canada.

POINT DE LIVRAISON : Parcs Canada
1156, rue Mill
Montréal, Québec H3K 2B3



PLAN

Assurer une finition de 90° pour ces 3 ouvertures. Une inspection sera faite sur place et Parcs Canada se réserve le droit de les refuser



ÉLÉVATION

PROFIL

TITRE: DESSIN DE FABRICATION DE POTEAUX POUR GARDE-CORPS AU CANAL LACHINE	
DATE: 2010-10-18	RÉV: 00
DESSINÉ PAR: M. GAUTHIER	VÉRIFIÉ PAR B. AYOTTE
ÉCHELLE: TELLE QU'INDIQUEE	NO. DESSIN C.L-14-121-01