



Parks Canada
Chambly Canal – National Historic Site of Canada
Rehabilitation of dike B8-14

CONSTRUCTION SPECIFICATION

Issued for tender

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List of Revisions

Revision				Revised Pages	Comments
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Undersigned engineers have prepared and verified the various sections of this specification:

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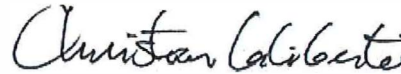
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<i>REF. No.</i>	<i>SNC Drawing No.</i>	<i>Plate</i>	<i>Drawing Title</i>
RUC-11-136.01	646180-1000-4GDD-0001-00	1	Dike B8-14 – Existing Conditions – General Layout
RUC-11-136.02	646180-1000-4GDD-0002-00	2	Dike B8-14 – Existing Conditions and Embankments – PM 2+610 to 3+280 – Plans
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RUC-11-136.05	646180-1000-4GDD-0005-00	5	Dike B8-14 – Existing Conditions and Embankments – PM 4+830 to 5+590 – Plans
RUC-11-136.06	646180-1000-4GDD-0006-00	6	Dike B8-14 – Existing Conditions and Embankments – PM 5+590 to Pont N 7 – Plans
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RUC-11-136.09	646180-1000-4GDD-0009-00	9	Dike B8-14 – Rehabilitation – Cross-Sections

END OF SECTION

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PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 10 14 53 –Signage.
- .2 Section 31 05 16 – Aggregate Materials.
- .3 Section 31 11 00 – Land Clearing and Felling.
- .4 Section 31 14 13 – Soil Stripping and Stockpiling.
- .5 Section 31 22 16.13 – Roadway Subgrade Reshaping.
- .6 Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .7 Section 31 32 19.01 – Geotextiles and Drains.
- .8 Section 31 37 00 – Rip-Rap.
- .9 Section 32 92 23 – Sodding and Topsoil.

1.2 DESCRIPTION OF FACILITIES

- .1 The Chambly Canal runs along the Richelieu River through the municipalities of Chambly, Carignan and Saint-Jean-sur-Richelieu and allows the navigable link between the Chambly Basin and the Haut-Richelieu. The Chambly Canal is composed of nine (9) locks allowing to cross a difference level of 24 m over a distance of approximately 19 km and to bypass the rapids of Chambly. The canal is divided into eight (8) bays whose operating level is distinct. The channel also has seven (7) movable bridges. The entrance to the Chambly Canal is located on the left bank of the Richelieu River, a little downstream of the St-Jean-sur-Richelieu marina.
- .2 Dike B8-14 is located on the east side of the Chambly Canal in the municipality of Carignan, Quebec, between lock No. 8 and bridge No. 7 (bay No. 8) with a crest length of approximately 3.55 km. The crest width of the structure generally varies between 2.5 and 4.6 m approximately but can also reach 9.9 m locally and the crest level varies between 28.7 and 29.9 m. Between Lock No. 8 and bridge No. 7, the geodetic elevation of the water level in the canal is maintained around 28.3 m during the navigation season. The dike reaches a maximum height of about 5.6 m. An unpaved bike path (green road) is built at the crest of the structure and Hydro-Québec poles (Bell Park) are located on the crest, downstream.

1.3 OBJECT

- .1 This document defines the works including labor supply, materials and equipment and all works required for civil work as part of the Chambly Canal dike B8-14 rehabilitation Project, in accordance with the drawings, the related technical specifications and the associated requirements from Parks Canada.

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1.4 CONTRACT TYPE

- .1 The work of this contract is paid according to the provisions of the different sections of this document and Section 01 29 00 – Payment Procedures.

1.5 WORK BY OTHERS

- .1 Work in collaboration with other Contractors (if required) and execute the instructions of the Parks Canada Agency.
- .2 Coordinate work with that of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work by another Contractor, report promptly to Parks Canada Agency, in writing, any anomalies or defects which may interfere with proper execution of work.

1.6 FUTURE WORK

- .1 Not used.

1.7 WORK SEQUENCE

- .1 The work must be completed by May 15th, 2020.
- .2 The canal is usually drawdown by the Agency starting the first Monday after Thanksgiving. It takes about 5 days to empty the canal. Refilling the canal occurs in early May.
 - .1 Drawing down the canal consists in evacuating water down to the invert of Outlets No 3 and No 4, respectively established at elevations 25.27 and 24.54 m.
 - .2 After drawing down the canal, some water accumulations of variable depth at the bottom of the canal remain.
 - .3 After the canal is drawn down, water flows into the canal from the watershed.
 - .1 These inflows vary according to the climatic conditions and are not controlled.
 - .2 The Agency does not actively manage water in or coming into the canal after the canal is drawn down.
 - .3 The gates at Outlets No 3 and No 4 are kept open.
 - .4 The gates of Lock No 8 are kept closed, except for the slide gate which is kept open.
 - .4 The Contractor is responsible for determining the appropriate work methods and equipment to manage the water accumulations remaining after drawdown of the Canal and the inflows of the watershed during the whole duration of the works in order to carry out the works in accordance with the drawings, this specification and the Parks Canada Agency requirements.
- .3 Work on the upstream side can only be done when the canal has been drawn down.
- .4 Work on the downstream side can be performed both when the canal has been drawn down and when it is full. The Contractor must take into account the applicable restrictions, including those relating to the

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- requirement to backfill a stripped division before the end of a shift, to the prohibition to excavate frozen materials and the acceptable temperatures when placing the Type 2 material.
- .5 The Contractor must perform the work in a systematic and orderly manner so as to complete the work in a division area as quickly as possible, in order to reduce the impacts on the users of the facilities and adjacent properties. A division is defined as an uninterrupted section of dike located between two accesses (road, bridge).
- .1 If, in a division, the Contractor carries out the work downstream and upstream at different times, he shall restore the bike path between the two phases of work to a state equivalent to or greater than the condition before the work began, and to the satisfaction of the Parks Canada Agency.
- .6 The Contractor must protect and maintain public traffic in accordance with Section 01 35 00.06 – Traffic Control.

1.8 CONTRACTOR USE OF PREMISES

- .1 The use of the premises is restricted to the areas necessary for the performance of the work, storage and access to enable work to be performed by other contractors and to allow navigation during the period when the canal is in operation.
- .1 During the navigation period, the Contractor shall, if equipment or activities impinge on the navigation area, instruct a signalman to notify the workers of an approaching boat to stop work and clear the navigation area. No slowdown or interruption of navigation is allowed.
- .1 If the Contractor anticipates that impingement will be possible in the navigation area for certain work, he must send a notice of work to Transport Canada. The Contractor shall conform to the requirements of Transport Canada and assume all costs.
- .2 During the period after the canal has been drawn down, the Contractor may set up temporary embankments in the canal to create access ramps, roads or cofferdams. In order to avoid serious harm to any fish (Section 35 of the Fisheries Act), these embankments must be approved by the Parks Canada Agency in accordance with sections 01 35 43 – Environmental Protection and 31 23 33.01 – Excavating, Trenching and Backfilling and must be removed in accordance with Section 01 52 00 – Construction Facilities at the end of the work.
- .1 Any temporary embankment must include at least one culvert for the free flow of water and fish in the canal.
- .2 The installation of cofferdams must not increase the water level in the canal. Provide a pumping system or work in phases to allow the water flow freely and to evacuate water in compliance with section 01 35 43 – Environmental Protection.
- .3 No temporary backfill may be placed between Lock No. 8 and Weir No. 3.
- .2 Coordinate the use of the premises as directed by the Parks Canada Agency.
- .3 Identify the additional work or storage areas required to perform the Work under this Contract and pay the cost.

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- .4 Once the work is completed, the existing work must be in a state equivalent to or better than the condition it presented before the work began.

1.9 OCCUPANCY OF SITE BY PARKS CANADA AGENCY

- .1 The Parks Canada Agency will occupy the site throughout the construction period in order to maintain navigation on the canal during the canal operation period, to maintain peak recreational traffic on crest on any division that does not have work in progress and continue its normal operation and canal maintenance.
- .2 Collaborate with the Parks Canada Agency on scheduling work to reduce conflict and facilitate site use.

1.10 EXISTING SERVICES

- .1 Notify the Parks Canada Agency 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 and notify the Parks Canada Agency of any findings.
- .3 Submit a schedule and obtain approval from Parks Canada Agency 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 Parks Canada Agency to maintain existing services.
- .5 Where unknown services are encountered, immediately notify the Parks Canada Agency and record findings in writing.
- .6 Protect, relocate or maintain functional service utility pipes. When inactive services are encountered during works, 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 35 00.06 – Traffic Control.

1.11 REQUIRED DOCUMENTS

- .1 Keep a copy of each of the following documents on the work site.
 - .1 Contract drawings.
 - .2 Contract.
 - .3 Addendum.
 - .4 Modification orders.
 - .5 Other changes to the contract.
 - .6 Field test reports.
 - .7 Copy of approved execution schedule.

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- .8 Health and Safety Plan and other security related documents.
- .9 Other indicated documents.

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 includes everything that is needed to perform the work requested, including, but not limited to, the supply of all materials, labor, tools, equipment, protection and transportation required to complete rehabilitation of the dike B8-14 in accordance with the requirements specified on the drawings and in the various sections of the specifications.
 - .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 Parks Canada Agency to such a distribution.
- .2 Work description
 - .1 The works in this contract include:
 - .1 Clearing and Grubbing of trees within the boundaries shown on the drawings, including the off-site disposition of trees with no market value. See Section 31 11 00 – Land Clearing and Felling.
 - .1 Felled trees with a market value will be stored in an area determined by Parks Canada Agency near the work site. The branches of these trees should be cut and disposed off site. Trees should be cut into commercial lengths.
 - .2 Stripping, excavation and embankment construction as shown in the drawings and presented in the specification, including the placement of geotextiles and drains, sodding, ditch excavation or cleaning, disposal of excavated material, construction, environmental protection, maintenance and dismantling of any temporary access road, ramp or cofferdam.

END OF SECTION

General Requirements – Work Restrictions
Section 01 14 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 CONSTRUCTION CONSTRAINTS

- .1 Several constraints will affect the realization of work. Thus, the completion of the work must be established taking into account:
 - .1 access availability by time of year and weather conditions;
 - .2 site availability for construction facilities;
 - .3 environmental constraints;
 - .4 security constraints;
 - .5 maintaining the integrity and stability of the dike;
 - .6 the presence of private properties neighboring the work area and existing infrastructures;
 - .7 the use of the dike crest track and the need to divert traffic that use it;
 - .8 the presence of water in the canal and boating for a defined period of the year;
 - .9 the presence of water and uncontrolled inflows from the canal watershed during execution of work on the upstream side, despite the canal having been drawdown by the Parks Canada Agency;
 - .10 restrictions on the sequence of excavation and backfilling work, including restrictions on the completion of certain parts of the work during a freeze period;
 - .11 the current condition of the dike crest, including its width and the nature of the underlying and backfill materials, including the resulting restrictions on access for the construction machinery and material transport trucks;
 - .12 the high level of the water table;
 - .13 the presence of soft soils at the bottom of the canal.
- .2 The Contractor must consider the constraints resulting from municipal regulations, including but not limited to noise and allowable loads on public roads, as well as load limits on the Chambly Canal bridges.
- .3 The Contractor must consider the proximity of the cadastral limit with the work to be done. No encroachment, temporary or permanent, is permitted unless the Contractor obtains the written agreement of the owner of the subject land. A copy of this agreement must be submitted to the Parks Canada Agency.

1.3 CONTRACTOR SITE ACCESS

- .1 Access to the site is by public roads that are not under the jurisdiction of the Parks Canada Agency. The Contractor is responsible for identifying potential restrictions and adapting the work plan accordingly.

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1.4 WORK SITE SIGNALING

- .1 The Contractor shall install and maintain adequate and safe signage to indicate detours, bypasses, restricted areas and hazards that will result from such work, including signage required to comply with Section 01 35 00.06 – Traffic Control.
- .2 The signage plan must be approved by the Parks Canada Agency in accordance with Section 01 33 00 – Submittal Procedures.
 - .1 This signage must be put in place and maintained throughout the duration of the project in accordance with the safety codes in force and to the satisfaction of the Parks Canada Agency. If, for any reason, the signage is insufficient or poorly maintained in the opinion of the Parks Canada Agency, the costs incurred to restore this signage will be deducted directly from the sums due to the Contractor.
 - .2 Failure to comply will result in the work being stopped by the Parks Canada Agency and the Contractor will not be able to claim compensation for the delays incurred.

1.5 USE OF PLACES AND FACILITIES

- .1 Perform the work with minimal disruption to normal use of the premises. In this regard, make the necessary arrangements with the Parks Canada Agency to facilitate the execution of the prescribed work.
- .2 Maintain existing utilities and provide access to the site to personnel and vehicles of the Contractor and the Parks Canada Agency.
- .3 Control access to the work area by third parties.
- .4 Where safety has been reduced because of the work, provide other temporary means to ensure the safety of property and people on the premises.

1.6 EXISTING SERVICES

- .1 Inform the Parks Canada Agency and the utility companies of the planned interruption of services and obtain the required authorizations.
- .2 Ensure the movement of personnel, the public and vehicles.
- .3 Construct protective barriers in accordance with Section 01 35 00.06 – Traffic Control.

1.7 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 public roads.

1.8 WORK BY OTHERS

- .1 Contractor must cooperate with other contractors working on site.

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1.9 SITE INSPECTION

- .1 Inspect the site to review and document existing conditions and identify items that may be damaged or displaced during the work. Take photographs and videos of the inventory before starting the work and give a copy to the Parks Canada Agency on a DVD or USB key.
- .2 After exposing items, inspect them for any condition that may affect the performance of the work.
- .3 The fact of starting work partially or totally by the Contractor implies that he accepts the existing conditions. If the Contractor performs his work on defective surfaces or conditions, corrections or rework will be made at his expense.
- .4 The Contractor is responsible for determining the proper working methods and equipment to perform the work without damaging the dike, particularly the materials underlying the work surface.
- .5 Provide and install supports to ensure the structural integrity of adjacent elements. Provide devices and consider methods to protect the dike against any damages.
- .6 Should the Contractor cause damage to the roads and facilities, the Contractor shall be solely responsible for repairing or replacing them at his own expense and to the satisfaction of the Parks Canada Agency.

1.10 DYNAMITING

- .1 No blasting work of any kind is allowed.

1.11 ENVIRONMENTAL RESTRICTIONS

- .1 Environmental restrictions are defined in section 01 35 43 – Environmental Protection.
- .2 Work shall meet federal, provincial and local noise requirements.

1.12 PROTECTION OF SURROUNDING PUBLIC AND PRIVATE PROPERTIES

- .1 During the work, the Contractor must protect all paved or unpaved surfaces. In addition, whatever the method chosen, the Contractor must, at his expense, restore in the same state, the paved surfaces and other surfaces damaged by the work. Circulation routes, methods of protection and restoration must, before the start of the works, be submitted to the Parks Canada Agency for approval.
- .2 Built-in third-party elements near the embankment or downstream foot of the dike must be protected from damage. If necessary, use manual means or small equipment for adjacent excavations and embankments.
- .3 Protect surrounding public and private properties against any damage that may result from the execution of the work.
- .4 In this case, the Contractor must assume full responsibility for the damage caused.

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1.13 LAND-SURVEYING

- .1 It is the responsibility of the Contractor to implement the various structures according to the plans of the Parks Canada Agency. He must make a survey of the existing at the periphery of the works to validate the connection to the existing one. In addition, he must notify the Parks Canada Agency and the Parks Canada Agency of any unexpected or detected anomalies. He must also provide for the time required for a possible audit by the Parks Canada Agency.
- .2 The Contractor must clearly mark on the site the boundary of the cadaster to provide a visual landmark to all interfering to avoid unauthorized intervention outside of it.
- .3 Identify all elements of the work such as foundation accepted, surface of embankments, position of underground elements, etc.
- .4 Prior to the final acceptance of the work, the Contractor must submit, on computer media, the survey plans after the work (FINAL PLANS).

1.14 WORK SCHEDULE

- .1 Construction work is allowed between 7:00 and 19:00, 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

General Requirements – Payment Procedures
Section 01 29 00

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 be 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 "Final Completion Certificate" for definitive acceptance.

.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.

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- .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
 - .1 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.
 - .2 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 Parks Canada Agency for approval.
- .6 Services
 - .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 - Health and Safety, and applicable laws and regulations.
- .8 Environment
 - .1 The protection of the environment, in accordance with Section 01 35 43 - Environmental Protection and applicable laws.

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- .2 Construction/demolition waste management, in accordance with the requirements of all sections of "Division 01 - General Requirements" of the Construction Specification.
- .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 Quality control;
 - .8 All other costs required for the complete execution of the works but not included in other unit or lump sum costs;
- .2 Item 1.2 – Dewatering and pumping of work zones
 - .1 This item remunerates on a lump sum basis all the necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for dewatering and pumping of the work zones.
 - .2 This item also includes the supply and installation of cofferdams not shown or not identified on the drawings or in the specifications which may be required for the complete and safe execution of the works including dismantling and restoration of the site at the end of the works.
 - .3 All costs necessary to complete this item must be included.
 - .4 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 Parks Canada Agency for approval.

The payment of this item will be made according to the progress of the work, as approved by the Parks Canada Agency.
- .2 Land clearing and felling
 - .1 Item 2.1 – Land clearing and felling
 - .1 This item remunerates on a lump sum basis all the necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for land clearing and felling within Parks Canada Agency property lines as per specification requirements and as shown in the drawings.

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- .2 This item also includes grubbing according to the specification requirements.
 - .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 Parks Canada Agency.
- .3 Rehabilitation work on the existing dike
- .1 Item 3.1 – Downstream slope
 - .1 Item 3.1.1 – Stripping downstream ditches and slopes
 - .1 This item remunerates at unit price per square meter (m²) of effectively stripped surface and includes all necessary measures, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for stripping downstream ditch and slope as per specification requirements and within the boundaries shown on the drawings.
 - .2 All costs necessary to complete this item must be included.
 - .3 Payment will be made for work completed and approved by the Parks Canada Agency.
 - .2 Item 3.1.2 – Excavation of new ditches
 - .1 This item remunerates at unit price in cubic meter (m³) at its original location the material effectively removed between the soil level immediately before excavation and the lines, slopes and grades shown on the drawings or the level designated by the Parks Canada Agency.
 - .2 This item also includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, engineering construction, work platforms, for the excavation of the new ditches according to the specification requirements and as shown in the drawings.
 - .3 All costs necessary to complete this item must be included.
 - .4 Payment will be made for work completed and approved by the Parks Canada Agency.
 - .3 Item 3.1.3 – Supply and placement of Type 2 material
 - .1 This item remunerates at unit price in cubic meter (m³) of compacted material effectively put in place measured according to the lines, slopes and grades indicated in the drawings and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, work platforms, for the construction of the Type 2 backfill according to the specification requirements and within the boundaries shown on the drawings.
 - .2 All costs necessary to complete this item must be included.
 - .3 Payment will be made for work completed and approved by the Parks Canada Agency.
 - .4 Item 3.1.4 – Supply and placement of Type 3 material
 - .1 This item remunerates at unit price in cubic meter (m³) of materials effectively put in place measured according to the lines, slopes and grades indicated in the drawings and

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- includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of Type 3 materials according to the specification requirements and within the boundaries shown on the drawings.
- .2 All costs necessary to complete this item must be included.
 - .3 Payment will be made for work completed and approved by the Parks Canada Agency.
- .5 Item 3.1.5 – Supply and installation of geotextiles
- .1 This item remunerates at unit price per square meter (m²) of fill surface effectively covered and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of geotextile according to the specification requirements and within the limits shown on the drawings.
 - .2 No allowance will be made for seams and overlaps.
 - .3 All costs necessary to complete this item must be included.
 - .4 Payment will be made for work completed and approved by the Parks Canada Agency.
- .6 Item 3.1.6 – Supply and installation of perforated drain pipe
- .1 This item remunerates at unit price in installed linear meter (m_{lin}) all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and installation of perforated drains according to the specification requirements and as shown in the drawings.
 - .2 This article also includes the geotextile sheath around the perforated drain according to the specification requirements.
 - .3 This article also includes the grids installed at the inlet and outlet of the drains according to the requirements of the specifications.
 - .4 All costs necessary to complete this item must be included.
 - .5 Payment will be made for work completed and approved by the Parks Canada Agency.
- .7 Item 3.1.7 – Supply and installation of access chimneys
- .1 This article remunerates at a unit price all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and installation of perforated drains access chimneys according to the requirements of the specifications and as shown in the drawings.
 - .2 All costs necessary to complete this item must be included.
 - .3 Payment will be made for work completed and approved by the Parks Canada Agency.
- .8 Item 3.1.8 – Sodding of the new ditches

General Requirements – Payment Procedures
Section 01 29 00

- .1 This article remunerates, at unit price per square meter (m^2) of surface effectively sodded and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the sodding of the new ditches according to the specification requirements and as shown on the drawings.
 - .2 All costs necessary to complete this item must be included.
 - .3 Payment will be made for work completed and approved by the Parks Canada Agency.
- .2 Item 3.2 – Upstream slope
- .1 Item 3.2.1 – Excavation
 - .1 This item remunerates at unit price in cubic meter (m^3) at its original location the material effectively removed between the soil level immediately before excavation and the lines, slopes and grades shown on the drawings or the level designated by the Parks Canada Agency.
 - .2 This item also includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, engineering construction, work platforms, for the excavation according to the specification requirements and as shown in the drawings.
 - .3 This article also includes the offsite layout as per the specification requirements.
 - .4 All costs necessary to complete this item must be included.
 - .5 Payment will be made for work completed and approved by the Parks Canada Agency.
 - .2 Item 3.2.2 – Supply and installation of geotextiles
 - .1 This item remunerates at unit price per square meter (m^2) of fill surface effectively covered and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of geotextile according to the requirements of the specifications and within the limits shown on the drawings.
 - .2 No allowance will be made for seams and overlaps.
 - .3 All costs necessary to complete this item must be included.
 - .4 Payment will be made for work completed and approved by the Parks Canada Agency.
 - .3 Item 3.2.3 – Supply and placement of Type 3 material
 - .1 This item remunerates at unit price in cubic meter (m^3) of materials effectively put in place measured according to the lines, slopes and grades indicated in the drawings and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of Type 3 materials according to the specification requirements and within the boundaries shown on the drawings.
 - .2 All costs necessary to complete this item must be included.

General Requirements – Payment Procedures
Section 01 29 00

- .3 Payment will be made for work completed and approved by the Parks Canada Agency.
- .4 Item 3.2.4 – Supply and placement of Type 4 material
 - .1 This item remunerates at unit price in cubic meter (m³) of materials effectively put in place measured according to the lines, slopes and grades indicated in the drawings and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of Type 4 materials according to the specification requirements and within the limits shown on the drawings.
 - .2 All costs necessary to complete this item must be included.
 - .3 Payment will be made for work completed and approved by the Parks Canada Agency.
- .3 Item 3.3 – Crest
 - .1 Item 3.3.1 – Supply and placement of Type 5 material for the bike path
 - .1 This item remunerates at unit price in cubic meter (m³) of compacted material effectively put in place measured according to the lines, slopes and grades indicated in the drawings and includes all necessary steps, actions and supplies such as, but not limited to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and installation of Type 5 materials for the bicycle path according to the requirements of the specification requirements and within the limits shown on the drawings.
 - .2 The crest rehabilitation work required to correct any damage caused during the work is at the expense of the Contractor and is excluded from this article.
 - .3 All costs necessary to complete this item must be included.
 - .4 Payment will be made for work completed and approved by Parks Canada Agency.
 - .2 Item 3.3.2 – Supply and placement of top soil in the buffer zones
 - .1 This item remunerates at unit price in cubic meter (m³) of material effectively put in place measured according to the lines, slopes and grades indicated in the drawings and includes all the necessary steps, actions and supplies such as, but not limited to, the management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of topsoil according to the specification requirements and within the limits shown on the drawings.
 - .2 No allowance will be made for the double handling of the topsoil (stockpiling and subsequent installation).
 - .3 All costs necessary to complete this item must be included.
 - .4 Payment will be made for work completed and approved by the Parks Canada Agency.
 - .3 Item 3.3.3 – Supply and placement of sod in the buffer zones
 - .1 This item remunerates, at unit price per square meter (m²) of surface effectively sodded and includes all necessary steps, actions and supplies such as, but not limited

General Requirements – Payment Procedures
Section 01 29 00

to, management, transportation, labor, equipment, materials, permits, professional services, construction engineering, work platforms, for the supply and placement of sodding according to the specification requirements and drawings.

- .2 All costs necessary to complete this item must be included.
- .3 Payment will be made for work completed and approved by the Parks Canada Agency.

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 Parks Canada Agency who will manage them. Meetings will be held at intervals or two (2) weeks or less as required by Parks Canada Agency. 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 Parks Canada Agency, Contractor and any other party required by Parks Canada Agency 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 16.07 – Construction Progress Schedules - Bar Chart (GANNT).
 - .3 Schedule of submission of shop drawings, samples, and color 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.
 - .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.

General Requirements – Project Meetings
Section 01 31 19

1.3 PROGRESS MEETINGS

- .1 Meetings will be held every two (2) weeks or more as needed, as required by Parks Canada Agency.
- .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 16.07

PART 1 GENERAL

1.1 RELATED SECTIONS

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

1.2 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 Chart (GRANTT) 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 Parks Canada Agency to enable monitoring of project work in relation to established milestones.

1.3 REQUIREMENTS

- .1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.
- .2 Ensure that restrictions on work on the downstream slope when the canal is full or during the frost periods as well as those relating to the period allowed for upstream work are respected according to sections 31 23 33 01 – Excavating, Trenching and Backfilling and 01 14 00 – Work Restrictions.
- .3 Plan to complete Work in accordance with prescribed milestones and time frame.
- .4 Limit activity durations to maximum of approximately ten (10) working days, to allow for progress reporting.

General Requirements
Construction Progress Schedule – Bar Chart (GANTT)
Section 01 32 16.07

- .5 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.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Maximum 10 working days after contract award, provide to Parks Canada Agency a Bar Chart (GANTT Chart) that would serve as master plan and will be used for planning and monitoring Work and for progress reports.

1.5 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.

1.6 MASTER PLAN

- .1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).
- .2 Parks Canada Agency will review and return revised schedules within 5 working days.
- .3 Revise impractical schedule and resubmit within 5 working days.
- .4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.7 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 The detailed Project Schedule must include at least the steps corresponding to the following activities:
 - .1 Contract Award.
 - .2 Shop Drawings, Samples.
 - .3 Permits.
 - .4 Mobilization.
 - .5 Deforestation
 - .6 Excavation.
 - .7 Backfill.

General Requirements
Construction Progress Schedule – Bar Chart (GANTT)
Section 01 32 16.07

- .8 Downstream works.
- .9 Upstream works.
- .10 Work subdivided by section between various public roads and bridges
- .11 Supplied equipment long delivery items.

1.8 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.

1.9 PROJECT MEETINGS

- .1 Discuss Project Schedule at regular site meetings according to the section 01 31 19 – Project 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

General Requirements – Submittal Procedures
Section 01 33 00

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Not used.

1.2 REFERENCES

- .1 Not used.

1.3 ADMINISTRATIVE

- .1 Submit to Parks Canada Agency 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 Parks Canada Agency. 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 Parks Canada Agency, 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 Parks Canada Agency's review of submittals.
- .8 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Parks Canada Agency 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).

General Requirements – Submittal Procedures
Section 01 33 00

1.4 DOCUMENTS REQUIRED FROM CONTRACTOR

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

1.5 CERTIFICATES AND TRANSCRIPTS

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

1.6 DATA SHEETS

- .1 Submit (1) electronic copy of test reports for requirements requested in specification Sections and as requested by Parks Canada Agency.
 - .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.
- .2 Submit (1) electronic copy of certificates for requirements requested in specification Sections and as requested by Parks Canada Agency.
 - .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.
- .3 Submit (1) electronic copy of manufacturer's instructions for requirements requested in specification Sections and as requested by Parks Canada Agency.
 - .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.
- .4 Submit (1) electronic copy of Manufacturer's Field Reports according to the section 01 45 00 – Quality control for requirements requested in specification Sections and as requested by Parks Canada Agency.
- .5 Submit documentation of the testing and verification actions taken according to the section 01 45 00 – Quality control to confirm compliance with manufacturer's standards or instructions.
- .6 Delete information not applicable to project.
- .7 Supplement standard information to provide details applicable to project.

1.7 PHOTOGRAPHIC DOCUMENTATION

- .1 Submit electronic and hard copy of color digital photography, fine resolution monthly with progress statement as directed by Parks Canada Agency.
- .2 Project identification: name and number of project and date of exposure indicated.

General Requirements – Submittal Procedures
Section 01 33 00

1.8 DOCUMENTS TO KEEP ON SITE

- .1 Provide two (2) set of drawings and indicate all changes made during the work.
- .2 Maintain the drawings and accurately record any deviations from the requirements of the contract documents, changes imposed because of the nature of the site and changes made to the order of the Parks Canada Agency.
- .3 Inscribe (in red) the changes
- .4 Record the following information
 - .1 On-site modifications to dimensions and execution details.
 - .2 Changes made as a result of ordered modifications and orders received on site.
- .5 Use Parks Canada Agency specifications for drawings.
- .6 Keep these drawings on site and make available for reference and verification.
- .7 Once the works is completed and before the final inspection, carefully transcribe the annotations on the second set of drawings and deliver the two complete sets to the Parks Canada Agency.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Materials to achieve an identical installation.
- .2 Any modification concerning materials must be the subject of a substitution request that must be filed before the end of the call for tenders.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

General Requirements – Documents and Samples to Submit
Section 01 33 00 A
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 prior to the implementation of the materials or the execution of the work:
 - .1 Compliance certificates of materials;
 - .2 Products data sheets;
 - .3 Material tests results;

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

- .2 These requirements must be completed before the application for provisional acceptance (prior to obtaining it) for the reception of the works with reservations.
 - .1 Final plans according to the section 01 14 00 – Work Restrictions;
 - .2 Annotated drawings according to the section 01 33 00 – Submittal Procedures;
 - .3 Employee training plan;
 - .4 Quality record according to the section 01 45 00 – Quality Control.

PART 3 DOCUMENTS REQUIRED FOR DEFINITIVE ACCEPTANCE

- .1 These requirements must be completed for work definitive acceptance by a completion document in accordance with the section 01 77 00 – Closeout Procedures which indicates that the tasks presented below have been performed:
 - .1 The work has been completed, inspected and found to comply with the requirements of the Contract Documents.
 - .2 List of defects and deficiencies fully completed and signed by the Parks Canada Agency.
 - .3 The work is ready for final inspection.

END OF APPENDIX A

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

PART 1 TGENERAL

1.1 RELATED SECTIONS

- .1 Not used

1.2 REFERENCES

- .1 Quebec Ministry of Transport, Standards - Road Works - Volume V, Road Signs.
- .2 Quebec Ministry of Transport , Related Works - Road Signs - Bike lanes.

1.3 DOCUMENTS / SAMPLES SUBMITTALS

- .1 Submit the required documents in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Forward to the Parks Canada Agency the plans detailing the measures planned to comply with the requirements of this specification.

1.4 ROADWAY ACCESS TO WORK SITE

- .1 Lay out the lanes, paths, ramps and pedestrian crossings needed to access the site.

1.5 PROTECTION, MAINTENANCE AND REGULATION OF PUBLIC TRAFFIC

- .1 The requirements of this section also apply to traffic on the multifunctional path at the crest of the dike (cyclists, pedestrians, etc.).
- .2 Comply with existing laws, rules and orders governing the traffic and the use of roads where work or material transportation is required.
- .3 If necessary, set up barriers for the execution of the work and the protection of the public.
- .4 Provide access roads and temporary bypass lanes to maintain traffic flow.
- .5 Maintain and protect traffic on the affected paths during construction, unless otherwise specifically directed by the Parks Canada Agency.
- .6 Provide measures for the protection and diversion of traffic, including the services of supervisors and signalers, the installation of barricades, the installation of lighting devices around and in front of the equipment and the work area, the installation and maintenance of appropriate warning signs, hazard signs and direction signs.
- .7 In case of diversion of the traffic of the users of the multifunctional path, respect the standards and make sure to install the necessary signs to clearly indicate the diversion paths to follow, to inform the users of the public roads of the presence of deviated traffic and of the need to share the paths, and to indicate the deviation distance before returning to the multifunctional path.
- .8 Protect the passengers against damage to people and property.

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

- .9 The Contractor's rolling stock used to transport materials entering or leaving the site must cause the least possible interference to road traffic.
- .10 Ensure that existing lanes and the load limits permitted on them are adequate. The Contractor is responsible for repairing damaged tracks as a result of construction work.
- .11 Build the necessary access roads and construction tracks.
- .12 Provide the necessary lighting fixtures, signage, barricades and markings necessary for an access road to the site and for a safe traffic.
- .13 Take the necessary steps to clear the dust to ensure the safe conduct of activities at all times and the protection of the environment.
- .14 Lighting fixtures shall provide full visibility of any other specified area, unless other authorized access ways are existing during the required periods.
- .15 Plan the removal of snow during the work period.
- .16 Once the work is completed, dismantle the worksite access roads designated by the Parks Canada Agency.
- .17 Maintain access to authorized Parks Canada Agency staff.

1.6 INFORMATION AND WARNING DEVICE

- .1 Provide and install delineators, barricades and other warning device in accordance with the Work Area Traffic Control Standards.
- .2 Install signs and other devices at locations recommended in the Work Area Traffic Control Standards.
- .3 Before the start of Work, consult with the Parks Canada Agency 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 Parks Canada Agency.
- .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.

1.7 TRAFFIC CONTROL - SPECIFIC REQUIREMENTS

- .1 The movement of boats and passengers on the waterway shall be maintained when the canal is watered, unless otherwise indicated by the Parks Canada Agency. Refer to clause 1.8 of Section 01 11 00 – Summary of Work.
- .2 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.

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

- .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.
- .5 Allow access to Parks Canada Agency vehicles.
- .6 Allow access to the public during the opening range.
- .3 Provide the devices and signal flares, gates, and lights necessary for the execution of the work and the protection of the public.
- .4 Provide a copy of the certificate of completion of the "Signaler of Roadworks" course of the signalers.

1.8 ACCESS ROUTES FOR EMERGENCY VEHICLES

- .1 Ensure access to the work site for emergency vehicles and provide for sufficient clearance of height.

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 – Health and Safety
Section 01 35 29.06

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Not used.

1.2 REFERENCES

- .1 Not used.

1.3 CONTENTS

- .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.

1.4 REFERENCE STANDARDS

- .1 Latest available revision of the following documents shall be used:
 - .1 Canada Labor 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. (2018);
 - .4 Safety Code for the Construction Industry, S-2.1, r.6 (2019);
 - .5 Standard CAN/CGSB-65.7-M88 Canadian General Standards Board (CGSB)
 - .6 Any other law or rule for health and safety that would be applicable depending on the company status or the context of the Work.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit required documents in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit to Parks Canada Agency a site-specific construction prevention plan in accordance with article 1.10 - HEALTH AND SAFETY MANAGEMENT of this Section at least 10 days before starting the work. Contractor shall update its prevention plan if the work differs from projections. Parks Canada Agency 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 Parks Canada Agency a Site inspection chart completed to the frequency indicated at article 1.16 – SITE INSPECTION AND DANGEROUS SITUATIONS CORRECTIONS of this Section.
- .4 Submit to Parks Canada Agency within 24 hours, a copy of any inspection report, correction or recommendation notice issued by federal or provincial inspectors.

General Requirements – Health and Safety
Section 01 35 29.06

- .5 Submit to Parks Canada Agency within 24 hours, an investigation report for any accident involving injury and any incident highlighting potential risk.
- .6 Submit to Parks Canada Agency identification sheets of all controlled products used on site at least 3 days before using the products.
- .7 Submit to Parks Canada Agency, if needed, 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 Parks Canada Agency 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 Parks Canada Agency with the prevention plan as specified in article 1.10 – 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 Parks Canada Agency without delay.
- .11 Plans and Statements of Conformity: Submit to Parks Canada Agency 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.

1.6 RISK / HAZARD EVALUATION

- .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 Parks Canada Agency a conformity statement signed by a competent

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mechanic. At any time, the Parks Canada Agency 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.

1.7 MEETINGS

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

1.8 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.

1.9 PROJECT/SITE CONDITIONS

- .1 On Site, Contractor shall consider the following particular conditions including but not limited to:
 - .1 Risk related to transshipment, and handling of materials and rejects as well as manual work near heavy equipment.
 - .2 Risks associated with work in winter conditions.
 - .3 Risks associated with the presence of the Chambly Canal, including steep slopes and flooded areas, and, during the period when the canal is drained, low bearing capacity soils, residual water and ice.
 - .4 Risk related to potential oil spillage and operations relating to its confinement.
 - .5 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 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.

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- .2 The Contractor is responsible for identifying risks and hazards and managing them in accordance with this section.

1.10 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 1.9 – PROJECT/SITE CONDITIONS. This plan shall be given to all concerned people in accordance with Article 1.5 – ACTION AND INFORMATIONAL SUBMITTALS. 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 1.5 – ACTION AND INFORMATIONAL SUBMITTALS. 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.

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1.11 RESPONSIBILITIES

- .1 Assume responsibility for the health and safety of those present on the site, as well as the protection of properties located on the site; also assume, in areas contiguous to the site, the protection of people and the environment to the extent that they are affected by the work.
- .2 As part of the construction work, the Contractor must be the prime contractor as described in the Act respecting the health and safety of work in Québec, to perform only the work that is part of its scope and defined areas and described in this specification.
- .3 Respect, and enforce by employees, the security requirements set out in applicable local, territorial, provincial and federal contract documents, ordinances, laws and regulations, as well as in the health and safety plan prepared for the site.
- .4 Injuries and accidents
 - .1 The Contractor and each subcontractor must appoint a first aid attendant before the work.
 - .2 A first aid kit is required in each contractor's trailer.

1.12 COMPLIANCE REQUIREMENTS

- .1 Comply with the Act respecting occupational health and safety, L.R.Q., c. S-2.1, and the Safety Code for the Construction Industry, c. S-2.1, r. 4.

1.13 COORDINATOR OF HEALTH AND SAFETY

- .1 No matter the site area/location 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 and in the immediate environment of the site/location of work 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 regulations, standards and site-specific Prevention Plan to the Site/location of work, and comply with all orders or correction notice issued by an inspector without delay.
- .3 The Contractor must take all measures required to keep work Site/area clean and tidy during the work.

1.14 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:

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- .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.

1.15 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 Parks Canada Agency by writing. Contractor shall make the required modification to the Prevention plan so that the work stays safe.

1.16 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 Parks Canada Agency, the Parks Canada Agency's health and safety coordinator, or during periodic inspections.
- .3 Submit to Parks Canada Agency 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 Parks Canada Agency. 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 1.10 - MANAGEMENT OF HEALTH AND SAFETY and the Section 1.11 – RESPONSIBILITY, the Parks Canada Agency 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.

1.17 BLASTING

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

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1.18 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.

1.19 SPECIFIC 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, r4.
- .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 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.
- .5 Fire Protection
 - .1 Comply with Section 01 35 35 - Fire and Safety – DND.
 - .2 Fire Protection Equipment. Contractor shall:
 - .1 Provide its own fire extinguisher of type ABC;
 - .2 Inspect equipment regularly;

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- .3 Provide fire extinguisher for each trailer and dredging equipment;
- .4 Have the fire extinguisher pressure checked once a year.
- .6 Confined space work
 - .1 Not used.
- .7 Environmental Protection
 - .1 See section 01 35 43 – Environmental Protection for more information.

1.20 STOP OF WORK

- .1 Grant the health and safety of the public and site personnel and the protection of the environment priority over cost and schedule issues.

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 Parks Canada Agency 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 By telephone.
- .3 When reporting fire by telephone, give location of fire 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.

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Section 01 35 35

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.

General Requirements – Fire and Safety (DND)
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- .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 above requirements to Fire Chief.

1.11 FIRE INSPECTION

- .1 Co-ordinate site inspections by Fire Chief through Parks Canada Agency.
- .2 Allow Fire Chief unrestricted access to work site.
- .3 Co-operate with Fire Chief during routine fire safety inspection of work site.
- .4 Immediately remedy unsafe fire situations observed by Fire Chief.

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 – Environmental Protection
Section 01 35 43

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 11 00 – Clearing and Felling
- .2 Section 31 05 16 – Aggregate Materials.
- .3 Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .4 Section 32 92 23 – Sodding and Topsoil.

1.2 DESCRIPTION

- .1 This section describes the environmental requirements related to the refurbishment work. The Contractor is responsible for respecting these requirements at all times while undertaking the work targeted by this specification.
- .2 Other sections may also contain specific requirements in regards to the protection of the environment. These specific requirements are additional to the requirements prescribed in this section. In contradictions are observed then the most stringent requirement must be respected.

1.3 REFERENCES

- .1 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 Invasive Alien Species (IAS): 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 vegetation, IAS include certain 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.
 - .6 Biologist: Resource with bachelor's degree in biology as minimum and at least five years field experience in the domain related to the required surveys.
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.2 References

.1 Government of Quebec, MSDEFACC

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

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

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

.3 Land Protection and Rehabilitation Regulation (Q-2, r. 37)

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

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

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

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

b. Intervention Guide - Soil Protection and Contaminated Sites Remediation (MSDEFACC, 2019)

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

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

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

.2 Government of Canada

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

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

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

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

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

f. Transportation of Dangerous Goods Act (L.R.C. (1992), c.34)

g. Canadian Environmental Quality Guidelines (CEQGs 1999)

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

.3 Municipal

a. Regulation No. 434 concerning noise

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

1.4 DOCUMENTS AND SAMPLES TO BE SUBMITTED FOR APPROVAL AND INFORMATION

.1 Required documents must be submitted in accordance with Section 01 33 00 - Submittal Procedures.

.2 Safety Data Sheets (SDS):

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- .1 Safety Data Sheets (SDS) along with the manufacturer's instructions and documentation for the use of hazardous materials on the construction site must be submitted. The sheets must indicate the product's characteristics in accordance with the Workplace Hazardous Materials Information System (WHMIS 2015).
- .3 Environmental Protection Plans and Emergency Measures Plan:
 - .1 Before beginning construction activities or delivering materials and equipment to the site, the Contractor must first submit an environmental protection plan and an environmental emergency plan (including a communication protocol) to the Parks Canada Agency for review and approval.
 - a. Plans must provide a comprehensive overview of known or potential environmental issues to be addressed during construction.
 - .2 The emergency plan must at least include the following information:
 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.
 - .3 The environmental protection plan must include the following minimal requirements:
 1. The names of persons to ensure compliance with the plan.
 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.
 5. A cutting and / or plant protection plan. This plan must be approved by the Parks Canada Agency prior to the commencement of deforestation work.
 6. An IAS Management Plan outlining the steps that will be taken to prevent their introduction and / or dispersal. This plan should include layout methods.
 7. Plans showing the location of construction sites, access roads, supply areas, sanitary facilities and waste storage areas.
 8. Development plans for site offices, parking lots, waste and storage areas (materials, soils) and other sites required for the work (including a description of projected material volumes, access roads, surface areas the quality of the underlying soils, earth moving, etc.) in accordance with Section 01 52 00 - Construction Facilities.
 9. Traffic control plans in accordance with Section 01 35 00.06 - Traffic Control, 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 surface runoff.

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10. A plan of the work area showing the activities planned in each part of the work area and indicating the restricted use areas as well as the prohibited areas of use. This plan must include measures to mark the limits of useable areas and methods of protecting the elements within authorized work areas.
11. A waste management and disposal plan (non-hazardous debris) including management methods and final disposal sites in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal
12. Air pollution prevention plan, specifying measures to retain dust, debris, materials and residual materials inside the site.
13. 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.
14. A management plan for embankment materials. The materials imported to the site and put in place during the work must come from approved borrow pits and quarries, be clean and free of undesirable species or contaminants in accordance with sections 31 05 16 – Aggregate Materials, 31 23 33.01 – Excavating, Trenching and Backfilling and 31 37 00 – Rip-Rap.
15. The emergency measure in case of spill must include a communication protocol, the procedures to be followed, the instructions to be followed and the reports to be produced in the event of an unforeseen spill of a regulated substance.
16. A Contaminated Soil Management Plan should be present in the work area and must be submitted to the Parks Canada Agency for approval prior to excavation work.
17. The actions included in the environmental protection plan must be presented in a level of detail that is consistent with the environmental problems and the work to be performed.

1.5 CONTRACTOR RESPONSIBILITIES

- .1 The work must be performed to the satisfaction of the Parks Canada Agency 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.
- .2 If unplanned work necessitates environmental authorizations, the Contractor, in addition to notifying and obtaining the Parks Canada Agency's approval, must obtain the necessary authorizations and permits from the relevant organizations to carry out the works. 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.
- .3 The Contractor must ensure to keep all evidence demonstrating their compliance.
- .4 The contractor must provide biologist services as per item 1.3.1.6.

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1.6 FIRES

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

1.7 SITE CLEARING

- .1 The site must be cleared in accordance with Section 31 11 00 - Clearing and Felling.

1.8 WORK ADJACENT TO WATERWAYS

- .1 Waterways must remain free of spoil, waste materials or debris.
- .2 Do not slide logs in the Chambly Canal.
- .3 Any debris accidentally introduced into the aquatic environment must be removed immediately.
- .4 The permanent encroachment on fish habitat is not permitted.
- .5 Temporary encroachments on fish habitat must be kept to a minimum to avoid loss of fish habitat and must be approved by the Parks Canada Agency.
- .6 For work on the upstream slope, the use of the working method from the top of the slope must be preferred to minimize work directly in the canal.
- .7 Construction materials used in a waterway must be handled and used in such a way as to prevent the release or leaching of substances that may be harmful to fish.
- .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 Cover the bottom of the canal, the banks and all surfaces that will be affected by the temporary layout of 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, make sure the geotextile is sufficiently clear on both sides of the material.
- .10 Erosion and sediment control measures must be in place while undertaking work,
 - .1 All areas at risk of erosion will require soil stabilization to avoid emitting particles. Required surface protection materials (ex: wood fibre bed, mulch, waterproofing membrane, riprap) will be obtained prior to work commencing.
 - .2 Inspection and maintenance of control measures must be performed regularly during the entire construction period. In the event of rain, quickly cover any exposed soil.
 - .3 Sediment barriers (equipped with geotextiles or wood fibers logs) must be installed, but not limited to, the following locations: at the base of the slope, the outskirts of a work space, parallel with the Canal as well as the perimeter of all piles of unconsolidated materials.

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1.9 POLLUTION PREVENTION

- .1 Not used.

1.10 PRESERVATION OF THE HISTORICAL AND ARCHEOLOGICAL CHARACTERISTIC

- .1 A plan must be provided defining the procedures used to identify and protect historical, archeological and cultural resources known to exist within the construction area. The plan must also define the procedures to be followed in the event of an unexpected discovery of these resources during the work period.
- .2 The plan must include measures used to ensure the protection of known or newly discovered resources along with the communication channels to be used between the Contractor's personnel and the Parks Canada Agency .

1.11 NOTICE OF NON-COMPLIANCE

- .1 A written notice of non-compliance will be issued to the Contractor by Park Canada's designated supervisor upon all observations that are non-compliant with a law, a regulation or a federal, provincial or municipal permit or any other component of the environmental protection plan that the Contractor is required to follow.
- .2 After receiving the notice of non-compliance, the Contractor must submit corrective measures to the Parks Canada Agency for approval and must implement them as soon as possible.
 - .1 The Contractor must first wait for the Parks Canada Agency's written approval before proceeding with the implementation of the proposed measures.
- .3 When needed, the Parks Canada Agency may emit a stop work order to halt all work activities until satisfactory corrective measures have been put in place.
- .4 No additional delays or schedule adjustments will be allowed following the stop work order.

PART 2 PRODUCTS

- .1 Not used.

PART 3 EXECUTION

3.1 ACCESS ROUTES AND CONSTRUCTION SITE SET UP

- .1 The set up of the construction site must be carried out in compliance with section 01 52 00 – Construction Facilities.
- .2 The circulation of machinery and the storage of materials must be confined to the areas previously identified.

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- .3 Vehicle access routes and circulation areas must be confined to the existing pathways and parking lots and other currently perturbed zones of Parks Canada. If the use of non-perturbed zones is required, then protection measures must be implemented such as the installation of a geotextile fabric layered with gravel.
- .4 Cemented and asphalted areas must be prioritized for the storage of construction materials.
- .5 Materials and machinery must not be stored on top of tree root networks within a minimum radius of 3 meters from the center of the tree's trunk or within the limit of the projection of the branches on the ground.

3.2 DRAINAGE OF WORK SPACES

- .1 Surface runoff within work spaces must be confined, sampled and treated when necessary before being discharged into the environment or into a sewage system.
- .2 Precipitation, surface runoff and pumped water must be diverted or redirected towards a sedimentation basin or a filtration structure (inlet filter) to reduce the input of particles to the Canal. The water discharged towards a stream, a sewage system, an evacuation or drainage system must remain compliant with surface water quality requirements set out by MSDEFACC (for the protection of aquatic life – acute effects), by CCME (water quality for the protection aquatic life) and by regulation number 2008-47 set out by the Metropolitan Community of Montreal (MCM). Water discharged into the stormwater drainage system or to a stream must not exceed the maximum allowed standard of 25 mg/L of suspended matter above the background content. The sampling point must be located at the exit of the pipe, at the discharge point.
- .3 Discharge areas must be pre-approved by the Parks Canada Agency.
- .4 The evacuation or elimination of water containing suspended matter or harmful substances must be compliant with site specific requirements.

3.3 DEWATERING

- .1 If dewatering is required, Contractor must follow the following measures:
 - .1 Provide temporary drainage and pumping necessary to keep excavations and site dry. The pumped water must be managed in accordance with the applicable regulations.
 - .2 Prior to the installation of temporary structures in Canal, a turbidity curtain must be installed in the Lachine Canal to surround the work area and prevent the dispersion of soils and fine particles in water throughout the duration of excavation work until final backfilling (including the removal of temporary facilities and the installation of the dry workspace).
 - .3 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.
 - .4 Turbidity curtain shall comply with the following specifications:

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- .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.
- .5 Fish inside temporary structure enclosure shall be captured manually with the help of a fish net and relocated in Chambly Basin. Capture and relocation of fish must be undertaken by a qualified person.
- .6 Install mesh at intakes and outlets to prevent entrainment or impingement of fish. Entrainment occurs when a fish is drawn into a water intake and cannot escape. Impingement occurs when a trapped fish is kept in contact with the entrance mesh and cannot be released.
- .7 Contractor shall gradually lower water level in the temporary works enclosure to facilitate catching fish.
- .8 Special attention should be given to the presence of special status species present in the Chambly basin and are therefore likely to end up in the Chambly Canal, namely the American Shad, the American Eel, the Copper Redhorse, the River Redhorse, the Eastern Sand Darter, the Lake Sturgeon, the Channel Darter, and the Bridle Shiner. All precautions must be taken when setting up temporary structures and during the rescue of fish that may be retained inside them during dewatering.
- .9 Fish found inside temporary structures must be carefully returned to the water before dewatering.

3.4 LAND USE

- .1 Coordinated efforts must be maintained with local authorities. Terrestrial and aquatic signposting suitable for all users within the work area must be installed.
- .2 An alternate schedule must be planned and the required signposting installed at the extremities of the construction site to allow the circulation of personnel, pedestrians, cyclists and vehicles.
- .3 The work schedule, elaborated in compliance with municipal regulations, must be respected.
- .4 The circulation of boaters must not be interrupted and the protection of workers must be overseen.
- .5 Equipment, material, and rubble from the works must not be left in the navigable waterway and must not obstruct navigation. The circulation of machinery must be confined to the areas previously defined.
- .6 The site must be returned to its initial state once the construction/work is completed.

3.5 PROTECTION OF VEGETATION

- .1 Vegetation must be protected in compliance with section 31 11 00 – Land Clearing and Felling.

3.6 INVASIVE ALIEN SPECIES

General Requirements – Environmental Protection
Section 01 35 43

- .1 Machinery used on the work site must be clean and clear of invasive species or harmful weeds upon arrival and must remain in that state.
- .2 The maintenance and cleaning of machinery and equipment used must be performed before and after the work to avoid the spread and establishment of terrestrial and aquatic invasive alien species.
- .3 Equipment that's been in contact with invasive alien species must be cleaned at a distance greater than 30 m from a waterbody and from areas prone to seed germination.
- .4 River banks and aquatic plant habitats located within the different work spaces must be inspected before work commences to identify the presence of invasive alien species. To avoid the spread of invasive alien species, inspections must also be performed after the completion of the construction work (within a delay of 3 months or during the next growing season) to ensure that no such species have been introduced. Corrective measures may be required of the Contractor if it has been observed that invasive alien species have been introduced to the area.
- .5 In areas where invasive alien species are present, excavated material from the construction site (e.g. topsoil, borrow material, backfill, gravel) may not be used in other areas of the Chambly Canal.
- .6 In the event that invasive alien species have been introduced to the area during the construction activities, quickly proceed with the eradication of the individuals using the recognized technique for the observed species.
- .7 If there are invasive alien species that need to be removed, place them in an impervious container to avoid their dispersal and dispose of them in an authorized area.

3.7 PROTECTION OF WILDLIFE

- .1 Removal of vegetation (grasses, shrubs and trees) must be performed outside the breeding seasons of bird and bat species, which generally extend from the 1st of April to August 15th for most species in the south of Quebec. Bird species at risk as well as migratory birds along with their nests are legally protected.
- .2 If wildlife are observed within or near the construction site, a safe and adequate exit from the area must be provided to distance them from potential accident areas and the Parks Canada Agency must be notified of all observations to ensure compliance with relevant legislation.
- .3 The removal of Milkweed between May and September must be avoided. If unavoidable, a biologist must first inspect the site prior to the removal of the vegetation to confirm that there aren't any caterpillars or monarch cocoons in the targeted area.
- .4 Not used
- .5 If turtles are observed in or near work areas, they must be captured and relocated by a biologist to a previously agreed location.
- .6 To minimize the mortality of amphibians using the ditch, a biologist must perform active searches using a dip net in suitable habitats located along the ditch. These searches are aimed at catching larvae, juveniles and adults. Captured specimens must be relocated to a previously agreed location. For a given section, carry out the searches the day before the construction work scheduled in this section.

General Requirements – Environmental Protection
Section 01 35 43

- .7 To minimize snake mortality, a biologist must capture and relocate as many individuals as possible using the following two approaches :
 - .1 For a given section, dispose of asphalt shingles in suitable habitats one week before the planned work in this section, then make a daily follow-up (two visits per day of each shingle), until the beginning of the work. The distance between the shingles should be about 50 m.
 - .2 Ensure constant monitoring during work. Stop work temporarily to allow snakes to escape outside the work area and, where possible, capture and relocate snakes to a previously agreed location. Clearing, stripping, excavation and embankment construction, as well as any relocation of machinery, are the main activities that may result in snake mortalities.

3.8 EQUIPMENT, VEHICLES AND MACHINERY

- .1 Circulation
 - .1 The boundary of the access route and work spaces must be clearly identified on the ground. Machinery must only circulate within the designated access routes and work spaces and, where appropriate, within the dried up or dammed work spaces in the water medium, as intended in the environmental authorizations.
 - .2 It is forbidden to cross a waterway.
 - .3 Avoid the displacement of vehicles during heavy rainfall and where soils are water saturated.
- .2 Machinery maintenance and refuelling
 - .1 The maintenance, refuelling and cleaning of machinery and the equipment containing petroleum products must be performed in an adapted site to avoid the risk of contaminating the soil as well as groundwater and surface water. The site must be located more than 30 m away from all waterbodies. If the site is located less than 30 m away from a waterbody, prior authorisation is required from the Parks Canada Agency before performing the activity. The site's surface must be impervious and have the capacity to contain the entire volume of hydrocarbons in the event of a spill or a leak. All these activities must be performed under constant supervision by the Contractor.
 - .2 The drainage of used oil from mobile equipment is forbidden on the construction site. Only drainage from non-mobile equipment is authorised. When used oil is being drained from non-mobile equipment, the Contractor must install equipment for the collection of spills (e.g. retention tank) and ensure enough protection of the soil (e.g. absorbing hydrophobic cushions).
 - .3 Used oil must be collected, transferred to an identified barrel and disposed of with the hazardous material by a recycler authorised by the MSDEFACC.
 - .4 Water used to wash equipment cannot be discharged directly into a waterway, waterbody or on the ground. The water must first be sampled and treated to remain compliant with surface water quality requirements defined by MSDEFACC (for the protection of aquatic life – acute effects), by CCME (water quality for the protection aquatic life) and by regulation number 2008-47 defined by the Metropolitan Community of Montreal (MCM).

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Section 01 35 43

- .5 The equipment used must be in good working condition, clean and exempt from all fuel, oil or grease leaks at all times. Otherwise they must be removed from the construction site immediately. The machinery must be inspected and cleaned before undertaking the works.
- .6 Machinery used within 30m from a water body will need to use a biodegradable and vegetable based hydraulic oil.

3.9 PROTECTION OF AIR QUALITY

- .1 The emission of particulate matter and dust on the construction site is not tolerated beyond the standards established by the Clean Air Regulation (Q-2, r. 4.1), which limits the radius of visible dust to less than 2 m from its source.
- .2 The Contractor is required to:
 - .1 Avoid the idling of all vehicles, equipment and machinery when they are not in use.
 - .2 Avoid leaving the engine on unnecessarily when machinery is not in use
 - .3 Repair all equipment and machinery that generate excessive exhaust gas emissions as soon as possible
 - .4 Ensure the antipollution system of equipment is kept in good working condition.
- .3 Under the current contract, the temporary installations designed to prevent air pollution must be kept in good working condition
- .4 Atmospheric emissions generated by material, equipment and tools must be controlled to respect the requirements defined by the authorities.
- .5 Dust produced from work spaces and temporary pathways must be suppressed.

3.10 PROTECTION AGAINST NOISE

- .1 The Contractor must control the noise level emanating from the construction site using the following measures:
 - .1 Machinery, equipment as well as all vehicles must be equipped with functioning mufflers at all time
 - .2 The slamming of back panels on dump trucks must always be avoided
 - .3 The use of equipment emitting low noise levels must be prioritised
 - .4 Noise deterring screens must be installed on equipment producing constant noise (e.g. Generators, etc.) in work spaces located near a sensitive receiver.
 - .5 Except for works of public utility, between 21:00 and 7:00 Monday to Friday and between 17:00 and 9:00 Saturday and Sunday, it is forbidden to allow the following activities:
 - a. The demolition, construction, modification or repair of a building or structure as well as excavation activities

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Section 01 35 43

- b. Lawn mowing, carpentry, tree cutting or felling, domestic maintenance and sawing of wood or metal
- c. Loading and unloading of merchandise, materials or other that produces noise in such a way as to disturb the peace and tranquility of the neighborhood (Rule no. 434 targeting nuisances, City of Carignan).

3.11 MANAGEMENT OF HYDROCARBONS AND HAZARDOUS MATERIALS

- .1 Petroleum products as well as all other hazardous material must be stored more than 30 m from all waterbodies. These products must be stored and confined to the dedicated areas. The storage of hazardous materials must be compliant with the provisions of the Regulation respecting hazardous materials (Q-2, r. 32).
- .2 Stationary equipment and machinery (generators, compressors, etc.) located less than 30 m from any waterbody must be equipped with hydrocarbon collection basins in the event of a leak or spill (with a capacity of at least 110% of the equipment or machinery's fuel reservoir volume). The basins must always be kept in good working condition .
- .3 The Contractor must supply the Parks Canada Agency the information sheets for the products they intend to use, at least 48 hours before their arrival on the construction site.
- .4 The disposal of new unused hazardous material is forbidden. At the end of the works, the Contractor must take all unused dangerous material with them to leave the site perfectly clean.
- .5 Hazardous waste material must be disposed of at a site authorized by the MSDEFACC.

3.12 PREVENTION OF SPILLS AND ENVIRONMENTAL INCIDENTS

- .1 The Contractor must supply the methods, measures and necessary resources to prevent the contamination of soil, water and air with harmful toxic substances and pollutants produced by construction activities.
- .2 The Contractor must be prepared to confine, clean and remove the spills or discharged substances that are likely to occur in water and/or soil. They must keep on site and within easy access a spill kit containing all the equipment and materials needed to clean any spill or discharge.
- .3 In the event of an environmental incident or spill, the Contractor must notify the Parks Canada Agency as soon as possible and remain compliant with the following rules:
 - .1 Control the spill
 - .2 Confine the spilt substance
 - .3 Remove the contaminant and contaminated materials
 - .4 Prepare a detailed report of the event which includes the description and location of the incident, the substance and quantity spilled, the date and time of the incident along with the name and telephone number of the person who first witnessed the incident.

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- .5 If an environmental incident occurs, the Contractor is required to notify the relevant authorities upon awareness of the incident. The Contractor must contact the emergency services of Environment and Climate Change Canada (1-866-283-2333) and of MSDEFACC (1-866-694-5454).
- .4 If a spill occurs, the contaminated soil, backfill material, sediment and/or water must be characterized. The Contractor is responsible for all costs incurred in relation to the characterization, decontamination and disposal of contaminated soils following the spill or leak of a contaminant as a direct or indirect result of their activities. The Contractor must dispose of the contaminated material at a site authorized by the MSDEFACC. Proof of disposal must be forwarded to the Parks Canada Agency.
- .5 Mixing contaminated soils with clean soils or with soils and materials less contaminated to dispose of them in a less restrictive way is forbidden.
- .6 The Contractor must always store on the construction site a sufficient number of emergency spill kits to contain and remove petroleum substances. The spill kit must contain enough absorbing material to enable a quick and effective intervention within the aquatic environment, along the entire length of the waterway and in the terrestrial environment within the perimeter of the machinery in question. The kit must contain spill socks and related accessories (E.g. gloves, etc.) to counter a small-scale spill and ensure the confinement, removal and storage of the soiled material as well as the management of contaminated material and soil.
- .7 The spill kits must always be easily accessible to allow a timely intervention anywhere on the construction site. Personnel most likely to use the spill kit must be given adequate training. The location of the spill kits on the construction site must be submitted to the Parks Canada Agency.

3.13 TEMPORARY SANITARY FACILITIES

- .1 The Contractor must supply and maintain the necessary temporary sanitary facilities intended for the use of persons accessing the construction site and must remove them upon work completion.
- .2 Wastewater produced from the temporary sanitary facilities must be disposed of in compliance with the regulations in place and in an area authorized by the MSDEFACC. Proof of disposal must be submitted to the Parks Canada Agency.

3.14 MANAGEMENT OF BACKFILL AND EXCAVATED MATERIAL

- .1 Excavated material (sediment, rocks, soil, topsoil, etc.) must be segregated and stored according to their type with respect to their potential for reuse on the site and according to their volume and level of contamination (E.g. general criteria, recommendations.). Segregation and storage must respect existing federal, provincial and municipal laws and regulations. As such, the excavated material must be characterized before determining if its reuse on the site is possible or if an off-site management is required. In which case, it will need to be managed in compliance with the relevant regulations.
- .2 Excavated material reused on the site must respect CCME's criteria with respect to its type of use and level of contamination
- .3 Excavated material that needs to be managed off-site must be loaded immediately to avoid storing it on-site.

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- .4 If the precise quality of the soil is not known or if unforeseen potentially contaminated soil is discovered, the Parks Canada Agency may sample the excavated material to perform a complementary characterization. When such a characterization is necessary, the Parks Canada Agency will inform the Contractor of the results and of the appropriate instructions to follow.
- .5 Areas of exposed and disturbed soil must be kept to a minimum and stabilized as soon as possible. The use of mulch, straw, membranes, riprap or all other mechanism to prevent and minimize the erosion of exposed soil must be in place.
- .6 The excess excavated material that will not be used on the site must be disposed of in compliance with the relevant regulations according to their level of contamination. In which case, a written proof of their reception (transport manifest or other, specifying the material type and quantity) at an area authorized by the MSDEFACC must be submitted to the Parks Canada Agency.
- .7 Up until their reuse or transport to an area for off-site management, heaps of excavated material must be stored on tarps and covered to suppress their exposure to winds and precipitations to avoid their dispersal.
- .8 Piled material must be covered to prevent erosion from wind and surface runoff.
- .9 Fine particles emanating from the stored soils must be suppressed with the use of sediment barriers surrounding the different work areas. Each of these storage areas must be managed differently, with respect to the type of work to be done and the duration.
- .10 Before pursuing with the excavation work, the Contractor must immediately notify the Parks Canada Agency of all site contamination discovered (by sight or smell).
- .11 During excavation work, if signs observed by sight or smell do not correspond with the anticipated level of contamination, the soil must then be temporarily stored on site in a designated area to be characterized with the required analyses and disposed of according to the level of contamination. The soil must be stored on an impervious surface and covered to protect it from any bad weather.
- .12 All backfill material must be clean and exempt of contaminants and of invasive alien species.

3.15 DISPOSAL OF SNOW FROM SNOW REMOVAL OPERATIONS

- .1 The disposal of snow must be done in compliance with section 01 74 11 - Cleaning

3.16 CLEANING

- .1 Cleaning must be done in compliance with section 01 74 11 - Cleaning
- .2 Waste management must be done in compliance with section 01 74 21 – Construction/Demolition Waste Management and Disposal.

3.17 SITE RESTORATION

- .1 Site restoration must be done in parallel with construction activities so that restoration may be finalized upon completion of the works and thus limit the duration of disturbances.
- .2 All rubble and unused material during the works must be removed from the site as soon as possible.

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Section 01 35 43

- .3 All disturbed/perturbed areas must be restored as fast as possible, preferably in parallel with the progress of construction activities.
- .4 The bed of the Canal, perturbed by the construction activities, must be restored to its original state (grain size, elevation, slope) unless indicated otherwise by the Parks Canada Agency and the notice supplied by Fisheries and Ocean Canada.
- .5 Grassed surfaces that have been damaged by the works must be restored according to the APC's requirements (specifications are presented in section 32 92 23 – Sodding and Topsoil).

END OF SECTION

General Requirements – Quality Control
Section 01 45 00

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 10 14 53 – Signage.
- .2 Section 31 05 16 – Aggregate Materials.
- .3 Section 31 11 00 – Land Clearing and Felling.
- .4 Section 31 14 13 – Soil Stripping and Stockpiling.
- .5 Section 31 22 16.13 – Roadway Subgrade Reshaping.
- .6 Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .7 Section 31 32 19.01 – Geotextiles and Drains.
- .8 Section 31 37 00 – Rip-Rap.
- .9 Section 32 92 23 – Sodding and Topsoil.

1.2 REFERENCES

- .1 Not used.

1.3 CONTRACTOR'S RESPONSIBILITIES

- .1 The Contractor shall be responsible for retaining the services of independent testing and inspection organizations for quality control. Independent testing and inspection organizations shall provide all test results directly to the Parks Canada Agency, with a copy to the Contractor and demonstrate that the level of quality and workmanship conforms to the requirements specified on the drawings and in these specifications. Independent organizations are responsible for providing all resources including, but not limited to, labor, equipment and facilities required for laboratory and field testing.
- .2 The Contractor must provide a Quality Manager to monitor the quality of work on the site. This person will be responsible for quality control of the Contractor and will have to ensure that the quality file is kept up to date. This person must ensure that the Parks Canada Agency is informed of all inspections at least 48 hours in advance of the operations so that he can make an appointment with the laboratory staff and schedule tests. The Quality Manager must ensure that the Parks Canada Agency is informed of all completed inspection reports when required.
- .3 The Contractor shall submit a plan for quality control, including inspections and tests, in accordance with the Parks Canada Agency's quality management procedure to ensure that the quality standards set out in this document, as well as their revisions/modifications are not compromised. The Parks Canada Agency reserves the right to verify the Contractor's quality control plan.
- .4 The Contractor must plan and perform all tests and inspection activities identified in the different sections of this specification.
- .5 All costs for independent testing and inspection are borne by the Contractor, including but not limited to:

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Section 01 45 00

- .1 Inspections and tests required by laws, ordinances, rules, regulations or instructions of public order.
- .2 Inspections and tests performed exclusively for the convenience of the Contractor.
- .3 Factory tests and certificates of conformity.
- .4 The tests that must be carried out by the Contractor under the supervision of the Parks Canada Agency.

1.4 INDEPENDENT TESTING AND INSPECTION AGENCIES

- .1 The Parks Canada Agency could sometimes hire his own inspection and testing firm to perform quality control according to the needs of the project.
 - .1 Provide the materials required by the designated organization for conducting the tests and inspections.
 - .2 The use of testing and inspection organizations does not relieve the Contractor of any responsibility for the performance of the Work in accordance with the requirements of the Contract Documents.
 - .3 If defects are found during testing and/or inspection, the designated organization will require further inspection and/or additional testing to accurately define the nature and extent of these defects. The Contractor must correct defects and imperfections as directed by the Parks Canada Agency, at no additional cost to the Parks Canada Agency, and assume the cost of testing and inspections to be performed after such corrections.
- .2 When the inspections or tests carried out by the designated testing laboratory reveal that the works are not in compliance with the requirements of the contract, the Contractor shall pay the cost of the additional tests or inspections that the Parks Canada Agency may request in order to check if the corrections made are acceptable.
- .3 The Contractor must provide the necessary manpower and facilities to perform the following:
 - .1 Allow access to the works to be inspected and tested.
 - .2 Facilitate inspections and testing.
 - .3 Repairs disturbed structures during inspections and tests.
 - .4 Allow laboratory staff to store equipment and process samples.
- .4 When materials are to be tested, send to the testing laboratory the requested quantity of representative samples.
- .5 Pay the cost of the work performed to uncover and refurbish the works that were covered before the required inspections or tests were performed and approved by the Parks Canada Agency.

1.5 INSPECTION

- .1 Allow Parks Canada Agency access to Work. If part of Work is taking place outside of the site, allow access to it during the whole length of Work.

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Section 01 45 00

- .2 In the case the work is subjected to special inspections, approvals or tests ordered by the Parks Canada Agency or required by local regulations at the site, make a request within a reasonable time.
- .3 If the Contractor has covered or permitted to cover a work before it has been subjected to the required inspections, approvals or special tests, he must discover the work in question for the performance of the inspections or tests required to the satisfaction of the competent authorities, then return the work to its original state.
- .4 The Parks Canada Agency of the Agency may order the inspection of any part of the work whose compliance with the contractual documents is in doubt. If, after examination, the work in question is declared to be non-compliant with the requirements of the contract documents, the Contractor shall take the necessary measures to bring the work into compliance with the specified requirements and to pay the inspection and repair costs. If the work in question complies with the requirements of the contract documents, the Parks Canada Agency will bear the cost of inspection and refurbishment.

1.6 ACCESS TO WORK

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Collaborate with these agencies and take all reasonable steps to ensure that they have the necessary means of access.

1.7 PROCEDURES

- .1 Notify the appropriate agency and Parks Canada Agency 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.

1.8 REJECTED WORKS

- .1 When an item of work is non-compliant with the requirements of the specifications or plans, record the non-compliance in a file. The record must include, for each non-compliance, the proposed corrective action which must be approved by the Parks Canada Agency.
- .2 Remove the defective items found to be non-compliant with the contractual documents and rejected by the Parks Canada Agency, either because they were not executed according to the appropriate rules, or because they were made with defective products or materials, even if they have already been incorporated into the structure. Replace or redo the elements in accordance with the requirements of the contractual documents.
- .3 If necessary, repair without delay the works of other contractors who have been damaged during the above-mentioned repair or replacement work.
- .4 If, in the opinion of the Parks Canada Agency, it is not appropriate to repair the defective or non-conforming works, the Parks Canada Agency will deduct from the contract price the difference in value

General Requirements – Quality Control
Section 01 45 00

between the work performed and that prescribed in the contract documents, the amount of such difference being determined by the Parks Canada Agency.

1.9 REPORTS

- .1 Provide four (4) copies of test and inspection reports to the Parks Canada Agency.
- .2 Provide report copies to subcontractors responsible for the work inspected or tested.
- .3 Maintain quality records that contain at least the following:
 - .1 Inspection and test reports;
 - .2 A register of nonconformities;
 - .3 Foundation approvals and other authorizations to proceed with work;
 - .4 Technical sheets and certificates of conformity of products and materials.
- .4 At the end of the works, at the time of the application for provisional acceptance, provide a complete quality record including a certificate signed by the Quality Manager stating that the quality control was carried out in accordance with the drawings and specifications requirements.

1.10 TESTS AND DOSAGE FORMULAS

- .1 Not used.

1.11 SAMPLES OF WORKS

- .1 Not used.

1.12 FACTORY TESTING

- .1 Not used.

1.13 MATERIALS, APPARATUS AND SYSTEMS

- .1 Not used.

General Requirements – Quality Control
Section 01 45 00

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 Facilities
Section 01 52 00

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 REFERENCES

- .1 Canadian Construction Documents Committee (CCDC)
 - .1 CCDC 2 -1994, Contract Price.
- .2 Canadian Standards Association (CSA)
 - .1 CAN / CSA-Z321-E96 (C2001), Signals and Symbols in the Workplace.

1.3 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.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit the required documents and samples in accordance with the Section 01 33 00 – Submittal Procedures.
- .2 The Contractor must have the site plan and facilities approved by the Parks Canada Agency in accordance with Section 01 35 43 – Environmental Protection.
- .3 The Contractor must obtain approval of the materials used and their provenance for temporary access by the Parks Canada Agency in accordance with Section 01 35 43 – Environmental Protection.

1.5 LIMIT OF RESPONSIBILITIES

- .1 Contractor is responsible for:
 - .1 Site offices;
 - .2 Outdoor storage for materials and equipment;
 - .3 Required access roads;
 - .4 Site toilets;

General Requirements – Construction Facilities
Section 01 52 00

- .5 Workers transportation;
- .6 Workers and equipment safety on site;
- .7 All loading/unloading work;
- .8 Maintenance of access roads (summer cleaning, gravel road grading and dust removal, snow removal);
- .9 Debris disposal;
- .10 Internet and phone links;
- .11 Customs clearance if required;
- .12 Construction fencing;
- .13 Safe access for visitors to the National Historic Site;
- .14 Lightning for work.

1.6 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.

1.7 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 Parks Canada Agency 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.
- .4 Office of the Parks Canada Agency:
 - .1 Set up a separate temporary office for the Parks Canada Agency.
 - .2 The office shall measure at least 3.6 m long x 3 m wide x 2.4 m high indoors and have a floor 0.3 m above the soil and 4 windows opening at 50% and a lockable door.
 - .3 The office must be well insulated and equipped with a heating and air conditioning system ensuring an ambient temperature of 22 degrees Celsius.

General Requirements – Construction Facilities
Section 01 52 00

- .4 Walls and ceilings must be lined with plywood, hardboard or plasterboard, and then painted in the colors chosen. The floor must be lined with 19 mm thick plywood panels.
- .5 The office must have an electric lighting system ensuring a lighting level of 750 lux; the appliances used must be of the commercial type, with direct illumination with 10% of the light directed towards the top, to be surface mounted, and to be provided with a reflector.
- .6 Arrange a private toilet near the office and install a chemical or flush toilet, sink and mirror, and supply paper towels and toilet paper.
- .7 Furnish the office with a 1m x 2m desk, 4 chairs, 300mm wide shelving, totaling 6m length, a three-drawer filing cabinet, a drawing rack and a clothes rack, with tablet.
- .8 Provide Internet access.
- .9

1.8 SERVICES

- .1 Provide sufficient chemical toilets.
- .2 Parks Canada does not supply any services (water, electricity or other).

1.9 PARKING ON SITE

- .1 Parking is permitted on certain areas only and limited. Contractor shall supply number of places required for his need to Parks Canada Agency for approval.
- .2 Provide and maintain suitable access roads to the site.
- .3 Clean roadways where construction equipment has been used.

1.10 STORAGE AREA

- .1 Site areas reserved for storage must first be approved by the Parks Canada Agency.
- .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. Contractor is responsible for securing its tools, equipment and materials.

1.11 CONSTRUCTION FENCING

- .1 Provide construction fencing around work areas and site installation if needed.

1.12 CONSTRUCTION SIGNAGE

- .1 Construction signs are permitted on construction trailers only. Dimensions and position shall be approved by Parks Canada Agency.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

General Requirements – Construction Facilities
Section 01 52 00

- .1 Traffic protection and maintenance must be performed in accordance with Section 01 35 00.06 – Traffic Control.

1.14 PEDESTRIAN, CYCLING AND NAVIGATION PROTECTION

- .1 Maintain and protect pedestrian and cycling traffic on affected tracks during construction unless otherwise specified by Parks Canada Agency.
- .2 Maintain and protect the movement of boats and passengers on the waterway during construction unless otherwise directed by the Parks Canada Agency and, if required, by Transport Canada.

1.15 CLEANING

- .1 Remove construction debris, waste materials, packaging material from work site daily in accordance with Section 01 74 11 – Cleaning.
- .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 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 PLACEMENT AND REMOVAL OF EQUIPMENT

- .1 Not used.

END OF SECTION

General Requirements – Common Product Requirements
Section 01 61 00

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 32 19.01 - Geotextiles and drains.
- .2 Section 31 05 16 – Aggregate Materials.
- .3 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.2 REFERENCES

- .1 In cases where there is still doubt as to the conformity of certain products or systems with the relevant standards, the Parks Canada Agency reserves the right to verify it by testing.
- .2 If the products or systems are in accordance with the contract documents, the costs incurred by these tests will be borne by the Parks Canada Agency, otherwise they will have to be borne by the Contractor.

1.3 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 Parks Canada Agency 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.

1.4 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 Parks Canada Agency 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 parks Canada Agency at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Parks Canada Agency reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

General Requirements – Common Product Requirements
Section 01 61 00

1.5 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 Remove and replace damaged products at no additional cost to the satisfaction of Parks Canada Agency.

1.6 DELIVERY

- .1 Pay delivery costs of products required.
- .2 Unload, handle and store such products.

1.7 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 Parks Canada Agency in writing, of conflicts between specifications and manufacturer's instructions, so that Parks Canada Agency will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Parks Canada Agency to require removal and re-installation at no increase in Contract Price or Contract Time.

1.8 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 Parks Canada Agency if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Parks Canada Agency 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 Parks Canada Agency, whose decision is final.

General Requirements – Common Product Requirements
Section 01 61 00

1.9 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.

1.10 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.

1.11 PROGRESS WORK PROTECTION

- .1 Do not overload any part of the structure.

1.12 EXISTING UTILITIES

- .1 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. State 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

General Requirements – Cleaning
Section 01 74 11

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 REFERENCES

- .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 CLEANING OF THE WORKSITE

- .1 Leave the places clean at the end of each working day.
- .2 Maintain Work in tidy condition, free from accumulation of waste products and debris, including that caused by Parks Canada Agency or other Contractors.
- .3 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 Parks Canada Agency.
- .4 Do not burn waste materials on site.
- .5 It is strictly forbidden to dispose of any material, waste, debris or residues in the Chambly Canal or in the Richelieu River. If so, they shall be quickly recovered.
- .6 Clear snow and ice from construction zones and access roads. Snow from the cleaning of working areas shall be disposed by Contractor in an area authorized by MSDEFACC in agreement with Parks Canada Agency. No snow can be thrown in the Chambly Canal or in the Richelieu River.
- .7 Keep public roads near the Site free from materials, waste, debris or residues and clean the roads quickly if required.
- .8 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .9 Provide on-site containers for waste materials and debris disposal.
- .10 Provide and use marked separate bins for recycling. Refer to Section 01 74 21- Construction/Demolition Waste Management and Disposal.
- .11 Dispose of waste materials and debris off site.
- .12 Clean interior areas prior to start of finishing work and maintain areas free of dust and other contaminants during finishing operations.

General Requirements – Cleaning
Section 01 74 11

- .13 Store volatile waste in covered metal containers and remove from premises at end of each working day.
- .14 Ensure that streams and storm and sanitary sewers remain free of wastes and removed volatile materials.

1.4 FINAL CLEANING

- .1 Upon substantial completion of work, remove surplus materials, tools, and construction equipment and materials that are no longer required to perform the remaining work.
 - .1 The Contractor is required to adapt his construction methods to be able to remove all materials used for its temporary access.
- .2 Remove debris and discarded materials, except those generated by other contractors, and leave areas clean and ready to occupy.
- .3 Prior to final inspection, remove surplus materials, tools, equipment and construction materials.
 - .1 Evacuate waste materials from the site and dispose of them according to the regulations. Waste materials should not be burned on site. Make the necessary arrangements and obtain permits from the competent authorities for the disposal of debris and waste materials. Evidence of disposition in a place authorized by the MSDEFACC shall be provided to the Parks Canada Agency.
 - .2 Remove snow and ice from construction areas and accesses.
 - .3 The Contractor must recover all hazardous residual materials (HRM) produced as part of its work. All HRMs must be sorted and managed in accordance with current regulations, including the Hazardous Materials Regulations (Q-2, r.32).
 - .4 The Contractor must dispose of his HRMs at a site authorized by the MSDEFACC. Evidence of disposition should be provided to the Parks Canada Agency.
 - .5 The Contractor must recover all the residual materials produced as part of its work (waste, recyclable materials, construction debris, etc.). All residual materials must be sorted and managed in accordance with the regulations in force and in accordance with Sections 01 35 43 – Environmental Protection and 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .6 The Contractor must dispose of his residual materials at a site authorized by the MSDEFACC. Evidence of disposition should be provided to the Parks Canada Agency.

1.5 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

General Requirements – Cleaning
Section 01 74 11

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/Demolition Waste Management and Disposal
Section 01 74 21

PART 1 GENERAL

1.1 WASTE MANAGEMENT GOALS

- .1 Prior to start the Work, meet with Parks Canada Agency 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.

1.2 RELATED SECTIONS

- .1 Section 31 11 00 – Land Clearing and Felling.
- .2 Section 31 23 33.01 – Excavating, Trenching and Backfilling.
- .3 Section 31 32 19.01 – Geotextiles and Drains.
- .4 Section 31 14 13 – Soil Stripping and Stockpiling.

1.3 REFERENCE

- .1 Definitions:
 - .1 Approved/Authorized Recycling Facility: Approved provincial recycler, or other material recyclers approved by the Parks Canada Agency.
 - .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.

General Requirements – Construction/Demolition Waste Management and Disposal
Section 01 74 21

- .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 the required documents and samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit, at intervals set by the Parks Canada Agency, 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.

General Requirements – Construction/Demolition Waste Management and Disposal
Section 01 74 21

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 Parks Canada Agency.

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 Parks Canada Agency.
- .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 structures safety is compromised, stop the Work and notify Parks Canada Agency 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.
- .12 It is recommended to sort waste materials at source.
- .13 Dispose of mixed waste materials collected to a treatment site outside worksite for sorting.
- .14 Obtain waybills, receipts and/or weight tickets for sorted and removed from site waste materials and submit them to the Parks Canada Agency.
- .15 On-site reused materials are valued and shall be included in any reports.

1.8 WASTE DISPOSAL

- .1 Accumulate as little waste and scrap material as possible.

General Requirements – Construction/Demolition Waste Management and Disposal
Section 01 74 21

- .2 Do not bury rubbish or waste.
- .3 It is forbidden to burn waste materials on site.
- .4 Do not dispose of materials, waste, hazardous residual materials (HRM), debris or residues in waterway or storm/sanitary sewer.
- .5 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.
- .6 Collect waste from site as work progresses.
- .7 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).
- .8 Dispose of HRM in a site authorized by the MSDEFACC. Provide disposition evidence to Parks Canada Agency.
- .9 Collect residual materials produced during the Work (waste, recyclable materials, construction debris, etc.) Sort and manage residual material according to the regulation in force.
- .10 Dispose of residual materials in a site authorized by MSDEFACC. Provide disposition evidence to Parks Canada Agency.

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.

General Requirements – Construction/Demolition Waste Management and Disposal
Section 01 74 21

PART 3 EXECUTION

3.1 GENERAL

- .1 Handle waste in accordance with applicable codes and regulations that are not reused, recycled or recovered.

3.2 CLEANING

- .1 Cleaning During Work: Perform cleaning according to Section 01 74 11 – Cleaning.
- .2 Leave the places clean at the end of each working day.
- .3 Final Cleaning: Remove surplus materials, rubbish, tools and equipment from site as per section 01 74 11 – Cleaning.
- .4 Waste management: sort waste for reuse and recycling or disposal.
- .5 Remove recycling bins from site and dispose of materials at appropriate facilities.
- .6 Sort waste materials that need to be reused or recycled at source and place them where indicated.

3.3 WASTE RECOVERY

- .1 Separate waste materials from the general waste depot and dispose of them separately or in separate containers, with the permission of the Parks Canada Agency and in accordance with relevant fire safety regulations.
- .2 Identify containers or storage areas.
- .3 Provide instructions regarding disposal practices.

END OF SECTION

General Requirements – Closeout Procedures
Section 01 77 00

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Not used

1.2 REFERENCES

- .1 Not used

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Inspection for provisional acceptance:
 - .1 Parks Canada Agency will conduct a work inspection with the Contractor to inspect incomplete Work and identify defects and deficiencies.
 - .2 Contractor to correct Work as directed.
- .2 Completion Tasks: submit written certificates in French certifying that the tasks indicated below were performed.
 - .1 Work completed and inspected for compliance with Contract Documents.
 - .2 Defects and deficiencies detected during inspections were corrected.
 - .3 Work are complete and ready for final inspection.
- .3 Final Inspection for definitive acceptance
 - .1 When completion tasks are done, request final inspection of Work by Parks Canada Agency and Contractor.
 - .2 When Work is considered incomplete according to Parks Canada, complete outstanding items and request re-inspection.

1.4 FINAL CLEANING

- .1 Remove surplus materials, excess materials, rubbish, tools and equipment in accordance with section 01 74 11 – Cleaning.
- .2 Manage waste in accordance with Section 01 74 21 – Construction / Demolition Waste Management and Disposal.

General Requirements – Closeout Procedures
Section 01 77 00

PART 2 PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Specialties – Signage
Section 10 14 53

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Not used

1.2 SIGNAGE SCOPE OF WORK

- .1 Dismantling and reinstallation of existing signage.
- .2 Manufacture, supply and installation of road signs around the dike, including supports.
- .3 Foundation work.
- .4 Clear vegetation around signage.

1.3 REFERENCE STANDARDS

- .1 American Association of State Highway and Transportation Officials (AASHTO)
 - .1 Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, (5th Edition).
- .2 Canadian Dam Association (CDA)
 - .1 Technical publication: Signage for Public Safety Around Dams
- .3 Canadian Standards Association (CSA)/ CSA International
 - .1 CSA G40.20/G40.21-F04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S16, Design of Steel Structure.
 - .3 CSA S157-17, Strength Design in Aluminum.
 - .4 CSA W47.1, Fusion Welding of Steel Company Certification.
 - .5 CSA W47.2, Certification of Companies for Fusion Welding of Aluminum.
 - .6 CSA W55.3, Resistance Welding Company Certification.
 - .7 CSA W59 Welded Steel Construction (Metal Arc Welding).
 - .8 CSA W59.2-M1991 (Confirmed in 2018), Welded Aluminum Construction.
- .4 ASTM International
 - .1 ASTM A123/A123M-09, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM B209M-10, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate Metric.
 - .3 ASTM B210M-05, Standard Specification for Aluminum-Alloy Drawn Seamless Tubes Metric.

Specialties – Signage
Section 10 14 53

- .4 ASTM B211M-03, Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod and Wire Metric.
- .5 ASTM E72-15, Standard Test Methods of Conducting Strength Tests of Panels for Building Construction.
- .5 American Welding Society (AWS).
 - .1 AWS A2.4:2007 Standard symbols for welding, brazing, and non-destructive examination.
- .6 Government of Quebec
 - .1 Ministry of Transport of Quebec, Standards, Road Works - Volume V, Road Signs.
 - .2 Ministry of Transport of Quebec, Related Works - Road Signs - Pulled apart - Bike lanes.
- .7 Canadian General Standards Board (CGSB)
 - .1 CGSB 62-GP-11M-78, Marking Material, Retroreflective, Enclosed Lens, Adhesive Backing and Amendment.
- .8 Green Seal Environmental Standards (GS)
 - .1 GS-11-11, Paints and Coatings.

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 for traffic signage, including product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Unless otherwise specified, submit shop drawing as soon as possible after contact award or minimum three (3) weeks prior to start the work.
 - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Quebec, Canada.
 - .3 Shop drawings shall indicate fabrication and assembly details including cuts, joints, holes, anchors, rivets and welds. Use AWS symbols to represent welds
 - .4 Submit a description of the work methods and the assembly order to Parks Canada Agency. Even though this formality is completed and approved, Contractor remains fully responsible for the use of methods and equipment, execution methods and security measures.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 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.

Specialties – Signage
Section 10 14 53

- .3 Storage and Handling Requirements:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal

PART 2 PRODUCTS

2.1 DESIGN CRITERIA

- .1 Sign supports to be capable of withstanding the combination of following loads:
 - .1 Wind loads in any direction of 1.11 kPa.
 - .2 Dead load of signboards and sign supports.
 - .3 Ice load of 0.26 kPa, applied on horizontal faces of signs and supports.
- .2 Structural deflections and vibration in accordance with American Association of State Highway and Transportation Officials (AASHTO), "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals".
- .3 Structures to be tested in accordance with ASTM E72.

2.2 MATERIALS

- .1 Sign supports:
 - .1 Panel supports must be in aluminum or galvanized steel.
 - .2 Steel posts: to CSA G40.21, grade 260W or 300W. Hot dipped galvanized: to ASTM A123/A123M, minimum zinc coating 610 g/m².
 - .3 Aluminum supports: aluminum alloy 6061-T6.
 - .4 Standard tubular supports for small signs: to ASTM B210M.
 - .5 Vertical tubular supports and connecting diagonal members: to ASTM B210M.
 - .6 Aluminum tubular members: belt ground satin finish.
 - .7 Base plates for ground mounted signs: to ASTM B209M.
 - .8 Tubular support caps for ground mounted signs: to ASTM B210M or fabricated from aluminum plate as specified in ASTM B209M. Castings for overhead signs: to ASTM B211M.
 - .9 Aluminum flanges: to ASTM B211M.
 - .10 Fasteners: bolts, nuts, washers and other hardware for roadside signs to be cast aluminum alloy, or galvanized steel.
- .2 Signboards:

Specialties – Signage
Section 10 14 53

- .1 Signs for bike lanes must be in accordance with the Ministry of Transport Standard, Related Books - Road Signs - Bike Lanes.
- .3 Aluminum sheet
 - .1 Aluminum sheet 5052-H32 minimum 3 mm thickness: to ASTM B209M, precut to required dimensions.
- .4 Aluminum frame
 - .1 6063-T6 aluminum alloy profile is extruded.
 - .2 6061-T6 T-shape stiffeners for signboards: to ASTM B210M.
 - .3 Connecting straps and brackets: to ASTM B209M.
 - .4 Aluminum materials: to ASTM B209M.
 - .5 Primer for aluminum: to MPI # 8, VOC limit of 250 according to GS-11.
 - .6 Reflective sheeting and tape: to CGSB 62-GP-11M. Adhesive, class of reflectivity and colour as indicated.
 - .7 Transparent tape: flexible, smooth-surfaced, moisture resistant tape with pressure sensitive adhesive.
 - .8 Clear varnish protective coat: MPI-EXT 6.4H, VOC limit of 350, SCAQMD Rule 1113.

2.3 FABRICATION

- .1 Signaling structures supplier shall be certified CSA-W47.2, CSA-W59.2 and able to calculate mechanical loads according to CAN/CSA S157-17.
- .2 Foundation:
 - .1 New foundations to be built as indicated on drawings.
 - .2 Foundations shall meet off-ground projections of 200 mm from the surrounding ground level.
- .3 Supports:
 - .1 Connect aluminum support members by bolting. Flame cutting of members not permitted.
 - .2 Reinforce in area of electrical hand holes to equal strength of full section member.
 - .3 Remove sharp edges and burrs.
- .4 Signboards:
 - .1 The maximum permitted gap of flat appearance shall not exceed 0.1mm per 1cm width.
 - .2 No holes shall be made on the front face of the sign unless requested by Parks Canada Agency. Holes' sizes and positions will be provided to manufacturer. Holes shall be drilled and not punched.
 - .3 Aluminum blanks:
 - .1 Degrease, etch and bonderize with chemical conversion coating.
 - .2 Clean surfaces with xylene thinner. Dry.

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- .3 For non-reflective signs, spray face with one coat vinyl pretreatment coating and two finish coats of required color.
- .4 Aluminum Structures:
 - .1 At mid-height, extruded aluminum alloy profile has a longitudinal stiffener. Both banks are shaped so that the head of a bolt can be inserted. Profile edges are drilled to allow bolting parts.
 - .2 Panels made from aluminum profiles with a maximum height of 3050 mm are pre-assembled with "T" stiffeners bolted to the back of the panels at the manufacture.
 - .3 For more information on aluminum structures, refer to “Transport Québec” standard drawings Vol. 3, Chapter 6.
- .5 Reflective background sheeting and lettering:
 - .1 Cut and apply in accordance with manufacturer's instructions.
 - .2 Apply adhesive coated material with heat lamp vacuum applicator or by squeeze roll application method. Apply pressure sensitive material with roller or squeegee.
 - .3 Edge wrap sheeting on each extrusion prior to bolting extrusions. Match pieces of sheeting from different rolls for each signboard to ensure uniform appearance and brilliance by day and night.
 - .4 Reflective signboard faces may be prepared using silk screen transparent ink.
- .6 Non-reflective lettering and symbols: cut from vinyl film as specified in CGSB 62-GP-9M, or paint using required color of finish paint maximum VOC of 350, SCAQMD Rule 1113 or silk screen transparent ink.
- .7 Clean signboards completely and apply transparent tape over top edge and extending 25 mm minimum down back and front of signboard.
- .8 Protect finished signboard faces with one coat of clear varnish with maximum VOC limit of 350, SCAQMD Rule 1113.
- .5 Sign identification:
 - .1 Apply sign number and date of installation with 25 mm high stencil painted black letters on lower left back face of each signboard.
 - .2 Signage structures must have a permanent nameplate and contain the following information :
 - .1 Manufacturer’s name or trade-mark,
 - .2 Pole dimensions (outside diameter and thickness)
 - .3 Material (Aluminum alloy)
 - .4 Year of manufacture.

Specialties – Signage
Section 10 14 53

PART 3 EXECUTION

3.1 REMOVAL AND REINSTALLATION OF EXISTING SIGNS

- .1 Dismantle existing signs and store them.
- .2 Reinstall the road signs according to this section.

3.2 INSTALLATION

- .1 Pay attention to elements surrounding the structure and the positioning of the structure to ensure good visibility of the signs to be installed.
- .2 Obtain approval from Parks Canada Agency prior to clearing vegetation around signs.
- .3 signaling gantries
 - .1 Install the signal gantries as indicated. The permissible vertical tolerance is 12 mm.
- .4 Sign support:
 - .1 Erect supports as indicated. Permissible tolerance: 10 mm maximum departure from vertical for direct buried supports.
 - .2 Close open aluminum tubes and posts with aluminum cap. Cut oblong holes in shoe bases to drain condensation. Install aluminum bolt cover on each base plate restraining nut.
 - .3 Erect posts plumb and square to details as indicated.
- .5 Signboard:
 - .1 Place bottom of signboards between 1200mm and 1500mm above ground.
 - .2 Fasten signboards to supporting posts and brackets as indicated.
 - .3 Use strapping with crimped or bolted connections where signs fastened to utility poles.
 - .4 Use T-shape aluminum stiffeners to join portions of sign panel on site. Cover face of T-stiffener with material identical to face of sign panel.
- .6 This specification does not necessarily contain a complete and detailed description of all accessories and parts required for the performance of its work. Contractor undertakes to supply and install all accessories and parts required to complete the work according to the standards.
- .7 Hardware required shall be new. Contractor is responsible for checking hardware tightening and adjustment on all bolted connections.

3.3 CORRECTING DEFECTS

- .1 Correct defects, identified by Parks Canada Agency, in sign message, consistency of reflectivity, color or illumination. Correct angle of signboard and adjust luminaire aiming angle for optimum performance during night conditions to approval of Parks Canada Agency.

Specialties – Signage
Section 10 14 53

3.4 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11- Cleaning.
 - .1 Leave Work areas clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11- Cleaning.
- .2 Waste Management: separate waste materials for reuse/recycling in accordance with Section 01 74 21- Construction/Demolition Waste Management and Disposal.
 - .1 Carefully dismantle and salvage wood, aluminum and steel materials for reuse and recycling.
 - .2 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by traffic signage installation and salvage operations.

END OF SECTION

Earthwork - Aggregate Materials
Section 31 05 16

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 31 11 00 – Land Clearing and Felling.

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 by Parks Canada Agency during production.
 - .2 Provide Parks Canada Agency with access to source and processed material for sampling.
 - .3 Install sampling facilities at discharge end of production conveyor, to allow Parks Canada Agency to obtain representative samples of items being produced. Stop conveyor belt when requested by Parks Canada Agency 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 Parks Canada Agency.
 - .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 Parks Canada Agency laboratory trailer at production site.
- .4 Sustainable Design Submittals:

Earthwork - Aggregate Materials
Section 31 05 16

- .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	≥ 2,6
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 Blasted rock selected and/or treated.
- .6 Type 5 material satisfying requirements of applicable section to be one of or blend of the following.
 - .1 Screening from crushing quarry blocks, boulders or gravel.

2.2 SOURCE QUALITY CONTROL

Earthwork - Aggregate Materials
Section 31 05 16

- .1 Inform Parks Canada Agency 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 Parks Canada Agency 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 Not used.
- .2 Processing:
 - .1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.
 - .2 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.
 - .1 Use methods and equipment approved in writing by Parks Canada Agency.
 - .3 Where necessary, screen, crush, wash, classify and process aggregates with suitable equipment to meet requirements.
 - .1 Use only equipment approved in writing by Parks Canada Agency.
 - .4 Stockpiling:
 - .1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Parks Canada Agency. 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.

Earthwork - Aggregate Materials
Section 31 05 16

- .6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by Parks Canada Agency 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 11 – Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – 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 Parks Canada Agency.
- .5 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 – 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 Parks Canada Agency.

END OF SECTION

Earthwork - Land Clearing and Felling
Section 31 11 00

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Not used.

1.2 PAYMENTS INDICATORS

- .1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

1.3 REFERENCES

- .1 Not used.

1.4 DEFINITIONS

- .1 Coarse land clearing consists of cutting down trees and the brush (non-commercial woody species) as well as the disposal of the trees cut down, the uprooted vegetation, the stumps and detritus that litter the ground.
- .2 Felling of isolated trees consists of cutting down trees specified in the plans as well as the disposal of felled trees and detritus.
- .3 Grubbing consists of removing the stumps to a minimum depth of 300 mm below the surface.

1.5 HEALTH AND SAFETY

- .1 The necessary construction health and safety measures must be in place in compliance with section 01 35 29.06 – Health and Safety.
- .2 Protection of workers
 - .1 Workers must wear gloves, anti-dust masks, long-sleeved clothes, protective eye-wear as well as protective clothing when spraying herbicides.
 - .2 The spill of preservative products must be cleaned immediately with the use of absorbent material that must be appropriately disposed of in a dump.

1.6 STORAGE AND PROTECTION

- .1 Woody detritus that may contain invasive alien species must be stored on a paved surface to prevent the propagation of such species.

Earthwork - Land Clearing and Felling
Section 31 11 00

- .2 A protective area must be delineated around the trees and shrubs (e.g. fences, tapes, barriers, etc.) located near the storage areas and the circulation routes so as to avoid damaging or affecting the root network. If it is impossible to do so, a protective system must be installed around the trunk and over the root network (wood planks, non-packed material with geotextile fabric, etc.). The trees and shrubs adjacent to work areas, storage areas and truck routes should be protected by creating a buffer zone with a 3m radius around the areas mentioned. If necessary, wrap the trees in a 2m high protective wood cage/fence from the ground-up.
- .3 Trees outside the tree felling area cannot be used as a support. The use of all herbicides is forbidden.
- .4 If excavation work must be undertaken between roots, begin by digging manually and cutting the roots with an axe or a well sharpened saw.
- .5 Fences, landscaped area, natural features, levelling markers, buildings and structures, hard refurbished surfaces, used channels, appended equipment, waterways and tree roots located near the work area must be protected.
 - .1 Damage to the features mentioned above must be repaired to the satisfaction of the Parks Canada Agency.
 - .2 If trees destined to be preserved are damaged during the work activities, a report prepared by a forestry engineer must be supplied and must include an assessment of the affected tree's potential of survival. If the tree's survival is affected by the damages, then it must be replaced according to the Parks Canada's indications.

1.7 MANAGEMENT AND DISPOSAL OF WOODY DETRITUS

- .1 Invasive alien species and the soil medium that may potentially contain such species must be buried in a site authorized by the MSDEFACC at a distance greater than 50 m from a waterbody or wetland. The invasive alien species must be removed from the work site in a covered dump truck to avoid all refusal.
- .2 Ash tree residue, such as branches and logs that do not exceed a diameter of 20 cm, must be shredded on site immediately during the pruning and felling works. The size of the wood shavings resulting from the shredding must not exceed 2.5 cm on at least two sides.
- .3 Ash tree residue, such as branches or logs with a diameter less than 20 cm must :
 - .1 Be sent to an authorized treatment site by the competent authority in the days following the felling and pruning.
OR
 - .2 Be sent to a wood transformation company or kept on site to be transformed using a compliant process in the days following the felling and pruning activities.
- .4 The chopped down vegetation that could be made into softwood sawlogs, pulpwood, rods, rails or marketable firewood must be collected.
 - .1 Remove the branches and heads of the chopped vegetation and saw at marketable lengths.
 - .2 These materials must be stored in Parks Canada Agency's workshops (1840 Bourgoigne street, Chambly).

Earthwork - Land Clearing and Felling
Section 31 11 00

- .1 The Parks Canada Agency must be advised at least 24h in advance to ensure access to Parks Canada Agency's workshops.

PART 2 PRODUCTS

- .1 Not used.

PART 3 EXECUTION

2.2 TEMPORARY EROSION AND SEDIMENT CONTROL MEASURES

- .1 Not used.

2.3 PREPARATION

- .1 The area must first be inspected and the features to be preserved identified with the Parks Canada Agency.
- .2 The trees and areas consisting of invasive alien species must be identified.

2.4 COMPLIANCE

- .1 Not used.

2.5 COARSE CLEARING

- .1 Land clearing includes the felling of designated trees and the satisfactory elimination of all removed vegetation, including the chopped down wood, stumps, brushwood and scraps found in the designated area.
- .2 Tree felling must occur before the 31st of March or after the 31st of August. If the felling occurs at the end of winter or at the beginning of spring, the felling of ash trees must definitely occur before the 15th of March.
- .3 Felling must follow the Parks Canada Agency's guidelines, at a height less than 300 mm from the ground.
- .4 The trees and branches that overhang the cleared area must be chopped according to the Parks Canada Agency's guidelines.
- .5 The removal of topsoil must be kept to a minimum.

2.6 ISOLATED TREES

- .1 The isolated trees must be cut according to the Parks Canada Agency's guidelines and at a maximum height of 300 mm from the ground.

Earthwork - Land Clearing and Felling
Section 31 11 00

2.7 GRUBBING

- .1 Stumps in areas within the excavation and backfill areas demonstrated in the drawing must be removed before stripping the ground.
- .2 The stumps must be removed with care so as to minimize damages to the underlying soil and adjacent surfaces.
- .3 The Parks Canada Agency must be notified of each stump removed and before undertaking all other work activities (stripping, excavation, backfill) so that they may inspect the underlying soil and determine if corrective measures are required to preserve the integrity of the embankment.

2.8 COMPLETION

- .1 Not used.

2.9 CLEANING

- .1 Not used.

END OF SECTION

Earthwork - Soil Stripping and Stockpiling
Section 31 14 13

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 REFERENCES

- .1 Not used.

1.3 MEASUREMENT AND PAYMENT

- .1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Sediment and erosion control shall be in accordance with section 01 35 43 – Environmental Protection.

3.2 STRIPPING OF TOPSOIL

- .1 Ensure that procedures comply with applicable Provincial and Municipal requirements.
- .2 Remove topsoil before construction procedures commence to avoid compaction of topsoil.
 - .1 Stripping must be done only within the limits indicated on the drawings or approved by Parks Canada Agency.
- .3 Stripping is prohibited when the soil is frozen. Start removing topsoil in areas designated by the Parks Canada Agency once brush, weeds, and lawn have been removed and disposed off site.
- .4 Remove topsoil to depth determined by Parks Canada Agency.
 - .1 On the dike's downstream slope, stripping must never exceed the limits of the fill materials to be placed.
 - .2 Unless Parks Canada Agency written authorization, it is prohibited to strip more than 30 meters of slope prior to constructing the embankment, and the entire slope under 2 m above the dike's downstream toe ground level and any wet or watery area, regardless of its elevation, must be covered with Type 2 material at the end of a working day.
 - .3 Do not mix topsoil with subsoil materials.

Earthwork - Soil Stripping and Stockpiling
Section 31 14 13

- .5 Handle topsoil only when it is dry and warm.
- .6 Place vegetation at targeted areas designated by Parks Canada Agency.
- .7 Stockpile height cannot exceed 2 m and needs to be protect against erosion
- .8 Pile topsoil in berms in locations as directed by Parks Canada Agency.
 - .1 Stockpile height not to exceed 2 m.
- .9 Dispose of unused topsoil in location as indicated by Parks Canada Agency.
- .10 Protect stockpiles from contamination and compaction.
- .11 Cover topsoil that has been piled for long term storage, with trefoil or grass to maintain agricultural potential of soil.

3.3 PREPARATION OF GRADE

- .1 Verify that grades are correct and ensure they are in accordance with drawings values. Notify Parks Canada Agency if discrepancies occur between grades and do not begin work until authorized by Parks Canada Agency.
- .2 Grade area only when soil is dry to lessen soil compaction.
- .3 Grade soil with scrapers establishing natural contours and eliminating uneven areas and low spots, ensuring positive drainage.

3.4 SUB-SOILING

- .1 Not used.

3.5 CLEANING

- .1 Proceed in accordance with Section 01 74 11 – Cleaning.
- .2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Earthwork - Roadway Subgrade Reshaping
Section 31 22 16.13

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Not used.

1.2 MEASUREMENT PROCEDURES

- .1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

1.3 GENERAL

- .1 The work described in this section concerns reshaping subgrade at the surface of the dike.
- .2 The work described in this section is required to repair any damage to the existing subgrade during the execution of the work.

1.4 REFERENCES

- .1 ASTM International
 - .1 ASTM D698-12, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (12 400 ft-lbf/ft³) (600 kN-m/m³).

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: prior to begin the work, review existing roadway subgrade conditions in accordance with Section 01 14 00 – Work Restrictions.
- .2 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for roadway subgrade reshaping installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Parks Canada Agency.
 - .2 Inform Parks Canada Agency of unacceptable conditions immediately upon discovery.

Earthwork - Roadway Subgrade Reshaping
Section 31 22 16.13

- .3 Proceed with installation only after unacceptable conditions have been remedied in accordance with Section 01 14 00 – Work Restrictions and after receipt of written approval to proceed from Parks Canada Agency.
- .3 The Contractor is responsible for determining the appropriate working methods and equipment to perform the work without damaging the dike, in particular the materials underlying the roadway subgrade. The Contractor is responsible for repairing any damage caused by his work methods and/or equipment.

3.2 SCARIFYING AND RESHAPING

- .1 Unless otherwise specified by the Parks Canada Agency, no scarification of the roadway subgrade will be permitted
- .2 Any contaminated roadway subgrade material needs to be removed and replaced.
- .3 Blade and trim uncontaminated materials to elevation and cross section dimensions as directed by Parks Canada Agency.
- .4 Where deficiency of material exists, add additional appropriate subgrade materials as directed by Parks Canada Agency.
- .5 Re-use excess material in areas of material deficiency as directed by Parks Canada Agency.

3.3 COMPACTING

- .1 Compact to at least 97% of minimum corrected maximum dry density to ASTM D698.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted subgrade surface.
- .3 Apply water as necessary during compaction to obtain specified density.
- .4 If material is excessively moist, aerate by scarifying with suitable equipment until moisture content is corrected to value not greater than 2 % moisture above optimum value for compaction to ASTM D698.

3.4 SITE TOLERANCES

- .1 Reshaped compacted surface must be no more than 10 mm above the indicated elevation. The elevation indicated on the drawing is minimal.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.
 - .1 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

Earthwork - Roadway Subgrade Reshaping
Section 31 22 16.13

3.6 PROTECTION

- .1 Protect and maintain reshaped surface in condition conforming to this Section until succeeding material is applied or until after receipt of written acceptance from Parks Canada Agency acceptance.

END OF SECTION

Earthwork - Excavating, Trenching and Backfilling
Section 31 23 33.01

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 31 05 16 – Aggregate Materials.
- .2 Section 31 11 00 – Land Clearing and Felling.
- .3 Section 31 14 13 – Soil Stripping and Stockpiling.
- .4 Section 31 32 19.01 – Geotextiles and Drains.
- .5 Section 31 37 00 – Rip-Rap.
- .6 Section 32 92 23 – Sodding and Topsoil.

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/m³).
 - .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 m³. Frozen material is not classified as rock.

Earthwork - Excavating, Trenching and Backfilling
Section 31 23 33.01

- .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 Topsoil:
 - .1 Refer to Section 32 92 23 – Sodding and Topsoil.
- .4 Waste material: excavated material unsuitable for use in Work or surplus to requirements.
- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of Work.
- .6 Recycled fill material: material, considered inert, obtained from alternate sources and engineered to meet requirements of fill areas.
- .7 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.
- .8 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 Parks Canada Agency proposed dewatering and heave prevention methods as described in PART 3 of this Section.
 - .3 Submit to Parks Canada Agency written notice at least 7 days prior to excavation work, to ensure cross sections are taken.
 - .4 Submit to Parks Canada Agency written notice when bottom of excavation is reached.
 - .5 Submit to Parks Canada Agency 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:

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Section 31 23 33.01

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Inform Parks Canada Agency 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 Parks Canada, 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 Parks Canada Agency.
- .8 Health and Safety Requirements:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .2 The backfill and cutting management must be in accordance with Section 01 35 43 – Environmental Protection.

1.8 EXISTING CONDITIONS

- .1 Examine soil reports available at Appendix D of Specification.
- .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.

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Section 31 23 33.01

- .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 Parks Canada Agency and authorities having jurisdiction to establish location and state of use of buried utilities and structures. Parks Canada Agency 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 Parks Canada Agency, 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 Parks Canada Agency.
 - .3 Where required for excavation, cut roots or branches as directed by Parks Canada Agency in accordance with Section 31 11 00. – Land Clearing and Felling.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 The different types of material used in the embankments are:
 - .1 Type 1: Impervious Material;
 - .2 Type 2: Filter Material;
 - .3 Type 3: Rockfill;
 - .4 Type 4: Riprap;
 - .5 Type 5: Screenings from crushing;
 - .6 Type 6: Topsoil.
- .2 General

Earthwork - Excavating, Trenching and Backfilling
Section 31 23 33.01

- .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 1, 2, 3 and 5 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-8.1 and/or CAN/CGSB-8.2.

Table 2-1: Limits of Specified Gradations

Sieve Designation	% passing			
	Type 1	Type 2	Type 3	Type 5
300 mm	-	-	100	-
100 mm	100	-	78-100	-
75 mm	80-100	100	-	-
50 mm	-	-	63-82	-
20 mm	65-100	90-100	40-70	-
10 mm	-	-	20-60	100
5 mm	50-95	70-100	0-45	50-100
2,5 mm	-	60-90	-	-
2,0 mm	-	-	-	30-65
1,25 mm	37-85	40-65	0-10	-
0,425 mm	-	-	-	10-30
0,315 mm	26-75	12-30	0-8	-
0,075 mm	15-60	0-5	Note 1	5-10

Note 1: The material placed on the upstream side must be free of particles with a diameter less than 0.075 mm. The material placed on the downstream side may contain a maximum of 5% of particles with a diameter less than 0.075 mm.

- .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 Parks Canada Agency satisfaction.
- .4 Type 1 material shall only be used for repairing the existing impervious dike backfill, for example in case of over-excavation.
- .5 Type 5 material must be MG5 crushed stone screenings.
 - .1 The color for this material must be gray limestone.

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- .6 Type 4 backfill materials: in accordance with Section 31 37 00 – Rip Rap.
- .7 Type 6 material: in accordance with Section 31 14 13 – Soil Stripping and Stockpiling.
 - .1 Type 6 material is a topsoil substrate and must be in accordance with Section 32 92 23 - Sodding and Topsoil. This material is used for extensive areas, urban parks or buffer areas between the bike path and embankment materials. Where damage is caused to extensive areas or urban parks, these materials shall be used to rehabilitate damaged surfaces, at the expense of the Contractor, to the Parks Canada Agency satisfaction.
- .8 Geotextiles: to Section 31 32 19.01 – Geotextiles and Drains.
- .9 Drains: to Section 31 32 19.01 – Geotextiles and Drains.

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 Parks Canada Agency 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 Carry out topsoil stripping in accordance with Section 31 14 13 – Soil Stripping and Stockpiling.

3.5 STOCKPILING

- .1 Stockpile fill materials in accordance with Section 01 35 43 – Environmental Protection.

3.6 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

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- .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, Parks Canada Agency to verify and advise methods.
- .2 Construct temporary Works to depths, heights and locations as approved by Parks Canada Agency.
- .3 Perform the following operations during backfill if sheet piles and shoring works are used:
 - .1 Unless otherwise indicated or directed by Parks Canada Agency, 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 Parks Canada Agency.

3.7 DEWATERING AND HEAVE PREVENTION

- .1 Keep excavations and backfill areas free of water while Work is in progress.
- .2 Submit to for Parks Canada Agency 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 Parks Canada Agency 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 Parks Canada Agency.
- .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.

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- .1 If excavating through roots, excavate by hand and cut roots with sharp axe or saw in accordance with Section 31 11 00 – Land Clearing and Felling.
- .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 safe distance away from edge of trench as directed by Parks Canada Agency.
- .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 Parks Canada Agency when bottom of excavation is reached.
- .13 Obtain Parks Canada Agency 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 Parks Canada Agency.
- .15 Correct unauthorized over-excavation as follow:
 - .1 Place Type 1 backfill compacted to not less than 95% of corrected Standard Proctor maximum dry density in accordance with ASTM D698.
- .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 - Geotextiles and Drains.

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 materials must be compacted to 95% of ASTM D4253. The layers must have a thickness of at most 150 mm after compaction.
 - .1 A manual compactor must be used to compact the 600 mm of backfill above the drains.
 - .2 Type 5 material must be compacted to 95% of ASTM D698. The layers must have a thickness of maximum 150 mm after compaction.
- .4 Type 3 Material

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- .1 Material shall not be dumped into place.
- .2 The material must be installed with an excavator in 300 mm thick horizontal layer and repeatedly pressed with the excavator bucket to ensure stability and interlocking of materials.
- .3 In the trench at the upstream toe, the material can be pushed into place by a bulldozer and compacted by repeated passages of the machine.
- .4 Dropping of stones should be at a height low enough to prevent damage to geotextiles and drains.
 - .1 The Contractor must replace damaged geotextiles and drains in accordance with Section 31 32 19.01 - Geotextiles and Drains.
- .5 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 Parks Canada Agency has inspected and approved foundation or layer of material that will be covered.
 - .2 Parks Canada Agency 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 Backfill of one type of material to be overlaid by another type must precede by at least 0.5 m measured vertically the level of the covering material.
- .6 At the end of a longitudinal backfill section, the materials in place must end on a 1.5H:1V slope or shallower and at a distance of at least 1m should be left between the edge of a material and one that covers it.
- .7 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.

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- .8 Not used.
- .9 Not used.
- .10 Install drainage system in backfill as directed by Parks Canada Agency.

3.12 PLACING OF TOPSOIL

- .1 Place topsoil (Type 6 material) in accordance with Section 32 92 23 – Sodding and Topsoil.

3.13 RESTORATION

- .1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by Parks Canada Agency.
- .2 Replace topsoil and sod as directed by Parks Canada Agency.
- .3 Reinstall pavements and bike path disturbed by excavation to thickness, structure and elevation as shown on drawings, unless otherwise specified by the Parks Canada Agency.
- .4 Clean and reinstall areas affected by Work as directed by Parks Canada Agency.
- .5 Use temporary plating to support traffic loads over unshrinkable fill for initial 24 hours.
- .6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

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3.14 CONTROL TESTS

- .1 The following table presents tests on backfill materials and minimum frequencies.
- .2 Table

Test	Reference	Type 1		Type 2		Type 3		Type 5	
		Vol.	Per.	Vol.	Per.	Vol.	Per.	Vol.	Per.
Grain Size Distribution	Random Fill (CAN/BNQ 2501-025)	---	OR	---	---	1/2T	---	---	---
	Fraction < 80 mm (CAN/BNQ 2501-025)	1/0,5T (1)	OR	1/T	1/D	---	---	1/T	1/D
Sedimentation	Fraction < 0,080 mm (CAN/BNQ 2501-025)	1/0,5T (1)	OR	---	---	---	---	---	---
Water Content	CAN/BNQ 2501-025	1/0,5T (1)	OR	--	---	---	---	---	---
Compaction	Normal Proctor Test method C (ASTM D698)	1/0,5T (1)	OR	---	---	---	---	1/T	1/D
	Max. Density (vibratory table) (ASTM D4253)	---	---	1/T	1/S-	---	---	---	---
In-situ Density	Nuclear Methods (ASTM D6938-8a)	1/0,5T (1)	OR	1/T	1/S	---	---	1/T	1/D
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

Earthwork - Geotextiles and drains
Section 31 32 19.01

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 D4491-2014, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
 - .3 ASTM D4595-17, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
 - .4 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.
 - .5 ASTM D4751-16, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .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.

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- .4 Bureau de normalisation du Québec
 - .1 BNQ 3624-115-2016 – Polyethylene (PE) Pipe and Fittings for Soil and Foundation Drainage.

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 At least 2 m length of drain including the geotextile sheath.
 - .4 Methods of joining drains.
- .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 21 – Construction/Demolition Waste Management and Disposal.

1.5 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 drains 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 21 - Construction/Demolition Waste Management and Disposal.

Earthwork - Geotextiles and drains
Section 31 32 19.01

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 407 g/m².
 - .3 Tensile strength and elongation (in any principal direction): to ASTM D4595.
 - .1 Tensile strength: minimum 1 470 N, wet condition.
 - .2 Elongation at break: 50-105%.
 - .3 Trapezoid tear strength: minimum 600 N.
 - .4 CBR puncture: 4 000 N
 - .5 UV resistance: 50%/500h
- .3 Geotextile: hydraulic properties:
 - .1 Apparent opening size (AOS): to ASTM D4751, 40 to 110 micrometres.
 - .2 Filtration opening size (FOS): to CAN/CGSB-148.1 No.10.
 - .3 Permeability: to CAN/CGSB-148.1, No.4, minimum 0.250 cm/s.
 - .4 Permittivity: to ASTM D4491, 0.41 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 PERFORATED DRAINS

- .1 Requirements for pipes:
 - .1 The pipes must have a nominal diameter of 200 mm.
 - .2 The internal and external walls must be corrugated.
 - .3 The pipes must be certified to BNQ 3624-115 and have a minimum stiffness of 210 kPa.
 - .4 The pipes must be made from polyethylene resin in accordance with ASTM D3350.
- .2 Perforations:
 - .1 Perforations shall be Type 2 in compliance with BNQ 3624-115.
 - .2 The total area of the perforations must be at least 32 cm² per meter of pipe length.

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- .3 The connections between the pipes must ensure proper positioning and connection between the pipes and comply with the BNQ 3624-115 standard.
- .4 The perforated drain and its assemblies must be coated with a filtering sheath made of non-woven geotextile with a 100 µm maximum opening size.

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 geotextiles or drains material installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Parks Canada Agency.
 - .2 Inform Parks Canada Agency 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 Parks Canada Agency.

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 300 mm over previously laid strip. The upstream strip must lie on the downstream strip.
 - .5 Not used.
 - .6 Not used.
 - .7 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
 - .8 After geotextile installation, cover with overlying material within 4 hours of placement.
 - .9 Replace damaged or deteriorated geotextile to approval of Parks Canada Agency.
 - .10 Place and compact embankments in accordance with Section 31 23 33.01 - Excavating, Trenching and Backfilling.
- .2 Drains
 - .1 On graded surface, install the drains covered with the geotextile filter sheath
 - .2 Place negative slopes to outlets.

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- .3 Prior to the start of pipe installation, the Parks Canada Agency shall inspect and approve the condition of the surface.
- .4 Provide connection between pipes as recommended by the manufacturer.
- .5 Drainage access chimneys must be provided for the maintenance.
 - .1 The access chimneys must be located at intervals of maximum 200 m along a drain and the location must be validated by the Parks Canada Agency.
 - .2 Parks Canada Agency may request to reduce the interval between chimneys.
 - .3 The access chimneys must be accessible from the surface and have a cap at the end. They must be vandalism proof and have a lock.
- .6 Grates must be installed at the entrances and exits of the drains to prevent animals and debris from obstructing the pipes.
- .7 Replace damaged and deteriorated pipes and geotextile filter sheaths to the satisfaction of the Parks Canada Agency.
- .8 Prior to disposing of the overlying material, the Parks Canada Agency shall inspect and approve the position of the pipe.
- .9 Dispose of overburden material within 4 hours of pipe placement.

3.3 CLEANING

- .1 Progress Cleaning: clean in accordance with Section [01 74 11 - Cleaning].
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - 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 and perforated drains.
- .2 After perforated drains installation, prohibit the circulation of vehicles on the backfill above the drains. Materials must be compacted in accordance with Section 31 23 33.01 – Excavating, Trenching and Backfilling.

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 Parks Canada Agency 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 21 – 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 Parks Canada Agency.

Earthwork - Rip-Rap
Section 31 37 00

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.

Nominal size of the blocks (D)	Dimension (mm)
D ₁₅ MIN	130
D ₅₀	175-200
D ₁₀₀	220-275

- .7 No nominal size block smaller than the specified minimum nominal size is permitted.
 - .8 Type 4 material must be free of particles smaller than 0.075 mm
- .2 The Parks Canada Agency 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 Parks Canada Agency 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 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 by filling depressions with selected bedding layer material as indicated in Section 31 23 33.01 – Excavating, Trenching and Backfilling and compact to provide firm bedding.

Earthwork - Rip-Rap
Section 31 37 00

- .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.
 - .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

Exterior Improvements - Sodding and Topsoil
Section 32 92 23

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 31 11 00 – Land Clearing and Felling.
- .2 Section 31 23 33.01 – Excavating, Trenching and Backfilling.

1.2 PAYMENT INDICATORS

- .1 The measurement and payment are made in accordance with Section 01 29 00 – Payment Procedures.

1.3 REFERENCES

- .1 Not used.

1.4 ADMINISTRATIVE CONDITIONS

- .1 Work schedule.
 - .1 The schedule for installing the sod must coincide with the surface preparation activities.
 - .2 Meetings prior to work commencing: a meeting must be held during which the work requirements, instructions and the guaranty are assessed in accordance with section 01 31 19 – Project meetings.

1.5 DOCUMENTS AND SAMPLES TO SUBMIT FOR APPROVAL/INFORMATION

- .1 Documents and samples required must be submitted consistent with section 01 33 00 – Documents and samples to be submitted.
- .2 Technical reports.
 - .1 The required technical reports must be submitted along with the supplier's instructions and documentation regarding the grass and the topsoil. The technical reports must indicate the product characteristics, the performance criteria, the dimensions, the constraints and the completion.
- .3 Samples
 - .1 The following samples must be submitted.
 - .1 Sod.
 - .1 The approved sod must be laid in such a way as to allow a one meter square sample and to ensure its maintenance during the establishment period, in accordance with the prescribed requirements.
 - .2 Topsoil.
 - .3 A 0.5 kg container for each type of fertilizer used.
 - .2 The samples must be approved by the Parks Canada Agency.

Exterior Improvements - Sodding and Topsoil
Section 32 92 23

- .4 Certificates: the documents signed by the supplier must be submitted certifying that the products and materials satisfy the prescriptions specifying the physical characteristics, the performance criteria of the seed mix, the pureness of the seeds and the quality of the grass.

1.6 QUALITY ASSURANCE

- .1 Skills
 - .1 Landscape maintenance supervisor: must be a landscaping technician certified in the maintenance of grassed surfaces.

1.7 TRANSPORT, STORAGE AND HANDLING OF MATERIALS

- .1 The transport, storage and handling of materials must be done in accordance with the supplier's written instructions (01 61 00 – Common Product requirements).
- .2 Delivery and reception: material and equipment delivered to the construction site must be in their initial packaging indicating the name and address of the manufacturer.
- .3 Storage and handling
 - .1 Materials must be stored in accordance with the supplier's recommendations.
 - .2 Faulty or damaged material and equipment must be replaced by new materials and equipment.
- .4 Management of packaging waste material: packaging waste must be collected to allow its reuse while ensuring crates and palettes are returned to the supplier with respect to the guidelines set out in the construction waste control plan and in accordance with section 01 74 21 – Construction/Demolition Waste Management and Disposal.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Cultivated grass encompassing the following criteria as much as possible :
 - .1 The presence of ground cover species.
 - .2 Grass requiring little maintenance (cutting or watering).
- .2 Topsoil
 - .1 All material that favors plant growth to be used as supplementary soil for landscaping or sowing.
 - .2 All material sufficiently exempt of subsoil, clumps of clay, brushwood, damaging weeds and other debris and exempt of stones, stumps, roots and other disturbing material greater than 25mm.
 - .3 Topsoil from the stripping activities can be reused for the sodding if it respects the criteria presented in the clauses 2.1 and 2.2.
- .3 Water
 - .1 The Contractor must supply the water. Parks Canada Agency does not supply water.

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2.2 QUALITY ASSURANCE OF THE SUPPLIER

- .1 The sodding material supply source must be given written approval by the Parks Canada Agency.
- .2 Once the supply source of sod is approved, no other supplier may be used without the Parks Canada Agency's written approval.

PART 3 EXECUTION

3.1 INSTALLERS

- .1 Registered members of the Quebec Interdisciplinary Horticultural Federation or of an affiliated association must be referred to for the installation.

3.2 EXAMINATION

- .1 Examination of surface conditions: before proceeding with the installation activities, the state of the surfaces previously prepared following the guidelines of other sections or contracts must be sufficiently acceptable to undertake the works in accordance with the manufacturer's written instructions.
 - .1 A visual inspection of the surfaces should be performed with the presence of the Parks Canada Agency.
 - .2 The Parks Canada Agency must be notified of all unacceptable conditions identified.
 - .3 The installation activities should only begin once the unacceptable conditions have been rectified and the Parks Canada Agency's written consent has been received.

3.3 APPLICATION OF TOPSOIL

- .1 The work should not be undertaken in unfavorable conditions. For example, if the ground is still frozen or soaking or if it is still covered in snow, ice or stagnant water.
- .2 The apparent density of the soil after application must not exceed 1,800 kg/m³.
- .3 The topsoil must be applied one week at most before the sodding activities are undertaken. The topsoil must be applied as a consistent 100 mm thick layer after compaction. The applied topsoil must be compacted but not densified above the specified maximum apparent density.
- .4 Stockpiled topsoil must be crumbled before being applied. Before sodding, the Contractor must remove all stones greater than 50 mm in diameter, all woody detritus, weeds and trash. The removed material must be transported off-site in accordance with section 01 74 21 – Construction/Demolition Waste Management and Disposal.
- .5 Ground surface levelling must be completed so as to produce a gentle and even slope, exempt of hollows and flat spaces so as to allow the natural drainage of the surface.

3.4 APPLICATION OF SODS

- .1 The use of sods must only target the frequently used areas (along the cycling paths for example).

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- .2 The sod application must be supervised by a certified landscaping supervisor.
- .3 If the outdoor temperature exceeds 20 degrees °C then the grass must be applied within the 24 hours following the stripping.
- .4 The sods must be applied in parallel strips with offset joints. The strips must be placed close together to avoid leaving any gaps but must not overlap each other. Narrow or irregular shaped strips must be trimmed using sharp tools.
- .5 The Parks Canada Agency's instructions must be followed to roll the grass appropriately. A light rolling should be performed to ensure a contact is maintained between the sod and the soil. The use of a heavy roller to rectify surface irregularities is forbidden.

3.5 CLEANING

- .1 Cleaning during works: cleaning activities must be performed in accordance with section 01 74 11 – Cleaning.
 - .1 The area must be left clean at the end of each work day.
 - .2 The pavement and adjacent surface must be kept clean and exempt of mud, dirt and debris at all times.
- .2 Final cleaning: all surplus material, equipment, tools and waste must be removed from the work site in accordance with section 01 74 11 – Cleaning.
 - .1 The areas affected by the work activities must be cleaned and returned to their original state.
- .3 Waste management: waste material must be sorted to allow their reuse or compost in accordance with section 01 74 21 – Construction/Demolition Waste Management and Disposal.
 - .1 Rubbish, recycling and compost bins must be removed from the work site. The material must be disposed of in the appropriate installations.
 - .2 Unused soil improving products must be disposed of at a registered hazardous waste material site approved by the Parks Canada Agency.

3.6 MAINTENANCE DURING THE ESTABLISHMENT PERIOD

- .1 The following maintenance activities must be undertaken once the sod has been installed and up until the work completion.
 - .1 The grass must be sufficiently and recurrently watered to maintain an optimal level of humidity up to a depth of 75 to 100 mm.
 - .2 The grass should be cut to a height of 50 mm once it has reached a maximum height of 75 mm.
 - .3 The lawn must be kept exempt of all weeds. 95% of the turf area must be weed free.
 - .4 Fertilizer should be applied on the grassed surface in accordance with the established fertilizing schedule. The required amount of fertilizer should be split in half and applied in perpendicular directions. The surface must then be well irrigated to make sure the fertilizer seeps into the soil.

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- .5 Barriers and temporary signposting must be kept in place where needed so as to protect the newly established grass.

3.7 RECEPTION OF WORKS

- .1 The surfaces covered in cultivated grass will be approved by the Parks Canada Agency once the following conditions have been respected :
 - .1 The grassed surface have adequately taken hold/established.
 - .2 The grassed surface is exempt of dead or bare patches.
 - .3 The soil layer remains unseen from a height of 1,500 mm after it has been cut to a height of 50 mm.
 - .4 The grassed surfaces have been cut at least twice before the final reception of works.
- .2 Grassed surfaces applied in the fall will be approved the following spring at least one month after the regrowth period if the previously mentioned conditions have been respected.
- .3 When environmental conditions allow it, all grassed surfaces that display cracks must be covered in planting mix and seeded with a mix of seeds consistent with the original mix.
- .4 Fall lawns will be accepted the following spring, one (1) month after the start of the growing season, if the above conditions are met.

3.8 MAINTENANCE DURING THE GUARANTY PERIOD

- .1 The following maintenance activities must be performed from the date of received works until the end of the guaranty period.
- .2 The grassed surfaces must be watered every week to maintain an optimal humidity level up to a depth of 100 mm.
- .3 All dead or bare patches must be repaired according to the Parks Canada Agency's satisfaction.
- .4 The mowing of Common Milkweed must be avoided between the months of May and September. If unable to do so, the site must first be inspected by a biologist to ensure there are no caterpillars or monarch cocoons in the targeted area.
- .5 The area must be mowed according to the Parks Canada Agency's instructions and the resulting detritus that may suffocate the grassed surface must be removed, once again according to the Parks Canada Agency's instructions. Existing weeds must be mechanically removed to suit the Parks Canada Agency's desired proportion.

END OF SECTION

Appendix A – Trees Inventory

Appendix B – Template for the Environmental Protection Plan (EPP)

Appendix C – Photos File of the Upstream Slope

Appendix D – Soil Analysis Reports

Appendix E – Previous work between Lock No. 8 and Weir No. 3
(Information not validated by SNC-Lavalin)