Securing of multi-use pathway of Lachine Canal national historic site, Montreal

Approaches to Sir Georges-Etienne-Cartier footbridge

Lemay project no: 16-0459.02
Parks Canada project no : 424-F-1

Issued for tender
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Parcs Canada Parks Canada

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PARKS CANADA

Lachine Canal National Historic Site

Multi-use pathway of Lachine Canal

TECHNICAL SPECIFICATIONS

FILE : 16-0459.02

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Prepared by : _____
Marie-Ève Parent, landscape architect

Approved by: _____
Lucie St-Pierre, landscape architect

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Annexes

1. PROJECT PRESENTATION AND CONTEXT

Parks Canada is securing the Lachine Canal multi-use pathway north and south of the Sir George-Etienne-Cartier Footbridge.

The present tender concerns specifically the construction of the proposed developments and their integration to the existing conditions. The Contractor will therefore have to coordinate and protect all existing works. On-site traffic will be restricted to the area of intervention during the project work.

2. SITE REVIEW

The Contractor will have to review by himself the state of the site before bidding and he will have to evaluate the quantities and nature of material that will have to be excavated and evacuated off site.

The Contractor remains responsible for locating any public utility infrastructure and must contact the organizations concerned with the exact location of their underground networks.

3. WORK DESCRIPTION

Work will include the following:

- Site protection;
- Demolition, removal and recycling;
- Precast concrete pavers surface;
- Crushed granite surface;
- Asphalt surface;
- Pavement marking;
- Supply of site furnishing items by Contractor: benches, litter bins, recycling bins, fixed and removable bollards; traffic signs: posts and signage ;
- Concrete bases for site furnishing items ;
- Installation of site furnishing items: benches, litter bins, recycling bins, fixed and removable bollards ;
- Traffic signs elements: posts and signage ;
- Supply of lighting elements by Contractor: Street lamps;
- Installation of lighting elements by Contractor: Street lamps;
- Planting work;
- Sodding.

4. TRAFFIC PROTECTION AND MAINTENANCE

1. Before commencing work, the Contractor shall take measures to facilitate and protect bicycle and pedestrian traffic around construction site.
2. The bike path will not be closed to traffic during construction period. Traffic must be maintained on the bike path throughout the entire construction period.
3. In its own circulation plan, the Contractor shall use the plan provided by Parks Canada Agency as a basis for its own plan and provide all necessary barriers and signage to ensure public safety.
4. The Contractor shall assume full responsibility for any damage, delay or accident caused to site users because of defective or insufficient signalling on any means of transit, temporary or otherwise, which he places at their disposal. He must also assume full responsibility for any damage that could, for any of these reasons, be caused to work being carried out.
5. If necessary, provide access paths and temporary diversion lanes to maintain traffic for all types of road vehicles and for pedestrians at all times.
6. Maintain and protect traffic on affected roads during construction, unless otherwise specifically indicated by the PCA Representative.
7. Provide measures for traffic protection and diversion, installation of barriers, installation of lighting devices around and in front of equipment and work area, installation and maintenance of warning signs, hazard warning signs and appropriate direction signs.
8. All trucks and rolling equipment of Contractor used to transport material, entering or leaving construction site must disturb as little as possible local road traffic.
9. Ensure that existing roads/lanes conditions and their load limits are adequate. Contractor will have to repair any damages caused to existing lanes by his construction work.
10. Build the necessary access roads and construction site paths.
11. Build construction site roads with adequate slope and width; avoid sharp curves, blind corners and any dangerous intersections.
12. Provide lighting equipment, signs, barriers and distinctive markings necessary for safe traffic.

13. Lighting equipment shall provide full visibility of the whole work area and full width of construction paths during evening and night shifts.
14. Take necessary measures to clear dust in order to ensure a safe conduct of activities at all times.
15. The location, slope, width, and alignment of access roads and runways have to be approved by PCA Representative.
16. Provide for removal of snow during construction work period.
17. Once construction work is completed, dismantle temporary construction sites.

5. SAFETY FENCES

Contractor must install safety fences around the construction site, in order to ensure the protection of public and of all work areas.

Contractor must install safety fences in accordance with the standards of the C.S.S.T. in effect. Any fences deemed unsafe by the PCA Representative must be immediately reinstalled to his / her satisfaction.

6. SITE PLAN

Contractor must provide, within 10 days after work beginning order, a complete site plan for approval, including the location of washrooms, off-site and on-site circulation planning, on-site storage areas.

7. CONSTRUCTION SCHEDULE

Contractor will have eight (8) weeks to complete work, after work beginning order.

Contractor must have his construction work schedule approved by the PCA Representative. The sequence should ensure that there is no heavy machinery used on new precast concrete pavement and cast-in-place concrete surfaces.

8. WORK CALENDAR

No later than five (5) business days after the award of project, Contractor must submit for approval by PCA Representative, his schedule for completion of all work, including the time required for supply and delivery of all materials.

9. ORIGIN AND IDENTIFICATION OF MATERIALS - PROOF OF PURCHASE, SAMPLES AND PRODUCT DATA SHEETS

Contractor must provide the PCA Representative with proof of purchase (or purchase orders) within 10 days after work beginning order for:

- Plants and plant material ;
- Lighting equipment;
- Soil mixes ;
- Geotextiles ;
- Guardrails;

- Litter and recycling bins;
- Benches.

Contractor must provide the PCA Representative within ten (10) days after work beginning order the samples and/or mockups of the following:

- All precast concrete pavers;
- Pavers laying bed and polymer sand.

Contractor must provide the PCA Representative within ten(10) days after work beginning order the product data sheets of the following:

- Polymer sand;
- Soil mixes:
- Sod;
- Lighting equipment;
- Benches;
- Litter and recycling bins ;
- Posts and signs ;
- Pavement marking.

10. WATERING WORK

When preparing the tender, Contractor must take note that no separate payment will be made for the watering work. This watering work must be included in all related items in the price schedule and that, for the entire duration of the contract, from the planting work to the final acceptance of all work, unless otherwise specifically stated.

Contractor must provide the necessary equipment and machinery in order to properly carry out the watering work.

11. MOBILIZATION AND DEMOBILIZATION

Mobilization and demobilization fees are included in related items in the schedule and include, but are not limited to, all costs associated with movements and transportation of machinery and labor, either within the limits of construction site, and/or between the site and any other place outside the site limits.

12. PUBLIC UTILITIES

Before beginning work, Contractor must locate all public utility structures, such as Hydro-Quebec, Bell Canada, Gaz Metro and others, and must take into account their presence, both underground and aerial during construction work.

Contractor must plan its work accordingly and can not make a claim to Parks Canada due to the presence of these structures, whether or not shown in the bid documents.

13. COLD WEATHER WORK

If Contractor performs work in cold weather, all related costs such as snow removal, heating and / or ventilation of pipes related to this work are included in the price submitted.

14. WORK AREA

Work area means:

- Sites where Contractor carries out the works consisting in this contract;
- Storage areas allocated to work;
- Other facilities required by Contractor.

Contractor shall not use as working area: access roads, such as passageways, streets, private entrances and cycle paths, as well as any other location not included in the work area or that may be detrimental to the use of the premises, public and private. Moreover, since most of the existing grass must be conserved, Contractor must limit the circulation of machinery on site.

15. FIRES

Fires and burning of garbage on site are not allowed.

16. CONSTRUCTION SITE INSTALLATION

Throughout the construction period, Contractor provides for his needs in terms of lighting, water and heating and bears the costs of installation and maintenance of these services.

17. WORK APPROVAL

Before proceeding with work, Contractor must validate the nature and quantity of work to be carried out. This validation must be done on site with the Parks Canada Representative. Particular attention must be paid to the localization of picketing/surveying work and localization of proposed infrastructures. Changes may be made on site in view of the particular nature of site.

18. PROPERTY PROTECTION AND DAMAGE REPAIR

Throughout the duration of contract, the Contractor must:

1) Refrain from entering private property for any reason without first obtaining formal permission;

2) Protect public or private property adjacent to construction site against any damage that may result directly or indirectly from the performance or failure to perform its work;
3) Take necessary precautions to avoid damaging fences, trees, hedges, shrubs, grass, curbs, pavements, pipes, cables, pipes or other underground and overhead structures. Otherwise, repairs or compensation will be at the Contractor's expense.
4) Any removal of tree, shrub or hedge must first be authorized by PCA Representative;
5) Protect monuments, markers, landmarks, level indicators and property lines against any displacement and damage, until an authorized firm attaches or transfers these markers or

landmarks and allows formally their displacement or removal.

Any damage to property must be repaired at the expense of Contractor and to the satisfaction of the Parks Canada Representative. The result must be of equivalent quality or superior to what previously existed.

Contractor will not receive any monetary compensation for repairing the damage he caused and will bear full responsibility for it.

19. ENVIRONNEMENTAL PROTECTION

Used and non-reusable machinery parts, used tires, empty containers and any solid or liquid waste must be removed from the construction site and disposed of in accordance with the Environment Quality Act, the Solid Waste Regulation and Hazardous Waste Regulations.

Machinery maintenance and repairs must be done in appropriate locations reserved for this purpose. The exhaust system of any vehicle or equipment used in the construction must be maintained in good condition so as not to unnecessarily disturb residents.

Any spill of oil, fuel, lubricant, insecticide or any other toxic material is strictly prohibited. In the event of an accidental spill, methods for recovering contaminant and contaminated soil and their disposal must first be approved by the Ministry of Sustainable Development, Environment, and Action against Climate Change (MDDELCC) and the Director.

Contractor must take note that, in accordance with the Quebec Department of the Environment's Shoreline, Shoreline and Flood Protection Policy, any action that could damage or modify the watercourse and shoreline is prohibited. Contractor may not store materials on shore shores and flood plains, circulate machinery or make trenches. At all times, disposal of excavation materials must be made outside water bodies (lakes, rivers, streams, etc.), their respective shores and their flood plains.

The following principles must be respected:

- Delimit hazardous work areas, in relation to atmospheric emissions of crystalline silica and asbestos, where appropriate;
- Work in a humid environment (provide water supply) to control particulate emissions. Otherwise capture those particles at their source with suction devices equipped with high efficiency filters (HEPA);
- Abrasive blasting must be carried out inside tarpaulins with suction devices fitted with high efficiency filters (HEPA) or use a wet jet;
- Cleaning of surfaces, cracks, tools or other with water, never with a air jet;
- Maintain construction and circulation areas to minimize residue accumulation and avoid emitting particles into the atmosphere (frequent collection, storage in closed containers or in covered and / or watered heaps, watering prior to handling);
- Capture wastewater generated by construction work and stormwater runoff. Implement required measures to retain sand, soil or other prior to their discharge into a sewer system.

20. WATER CONTROL

Contractor is responsible for surface drainage and is required to discharge rainwater, snowmelt water, groundwater and any other source of water on site. Contractor shall, at his own expense, remedy all damage and inconvenience caused by any water of any nature whatsoever.

21. DUST CONTROL

Contractor must take all the necessary measures to control dust coming from construction site until the provisional acceptance of work, taking into account the proximity of residents, businesses, adjacent institutions and vehicular traffic.

22. PRECAUTIONS AGAINST NOISE

Appliances and equipment used on site must not emit noise that may cause undue discomfort. For this purpose, they must be equipped, if necessary, with special devices in good working order, to ensure their soundproofing.

23. MATERIAL DISPOSAL

Excavation material not needed for further construction work will be transported off site at the Contractor's expense. This excavation material becomes the Contractor's property, who must dispose of it according to the norms and laws in force, after having obtained a written authorization from the owners of the concerned sites.

24. WORK NOT DESCRIBED

Contractor must do all the minor work which, even if not specified in the documents, is usual and necessary for the completion of the various work of this contract. Cost of these minor works is included in the unit prices of the price schedule of tender.

25. WORK SCHEDULE

Unless otherwise authorized by DIrector, construction work must not begin before 7:00 and should not end after 19:00, 7 days a week.

26. ARCHEOLOGY

1. SPECIAL REQUIREMENTS

The Lachine Canal National Historic Site of Canada has been recognized by the Canadian government as one of the highest heritage value sites. Therefore, on this property, any soil excavation work identified as possibly containing archaeological remains must be monitored by an archaeologist identified by the federal government.

Considering the possibility of archaeological discoveries, the Contractor is advised that, in the event of fortuitous discoveries of cultural resources during project works (constructions vestiges of any kind, objects and object fragments) carried out in the absence of an archaeologist, work shall be immediately stopped in the immediate area of the discovery and PCA representative notified. Contractor shall then await instructions before continuing work in area of discovery.

In the event that, due to the archaeological potential of the Lachine Canal National Historic Site, archaeological remains were discovered during the necessary excavation work, this work could be the subject of this section.

2. ACCESS AND COLLABORATION

a) Contractor shall cooperate and comply with all project manager instructions during excavation work to avoid any loss of archaeological information on site, if applicable.

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

c) If applicable, Contractor will be required to allow the archeology team to conduct the archaeological examinations and surveys.

3. ARCHAEOLOGICAL DISCOVERIES

a) The remains, antiques and other items of historical, archaeological or scientific interest (remains, objects or fragments of objects) found on site or in the areas to be excavated or demolished remain the property of the Crown. Contractor will need to protect them and obtain guidance from the project manager in this regard.

4. SUSPENSION OF WORK

a) Contractor shall include in its contract, at its expense, fifteen (15) minute stops per half-day of excavation in areas requiring the presence of the archaeologist (as described in 1.1 above). section). These stops, if not used, will be accumulated and can be reused, as needed, later. A record of unused time will be kept by the Parks Canada representative in consultation with the Contractor and the archaeologist.

b) For a stop of more than 30 minutes, the Parks Canada Representative will evaluate the implications of this stop and will notify Contractor accordingly. The Contractor may be required to assign the machinery to another sector to allow the continuation of the archaeologists work. If the reassignment is impossible, Contractor will be compensated from the bank of hours or, if this bank is exhausted, according to the agreements planned during the kick-off meeting (first site meeting).

c) In the event of accidental discoveries of cultural resources made in the absence of an archaeologist, the project manager or representative must stop work in the immediate area of the discovery and advise the Parks Canada project manager, which will then take the necessary measures to protect and conserve the observed resource(s) discovered.

5. MANUAL EXCAVATIONS FOR ARCHAEOLOGICAL PURPOSES

a) Given the possibility of archaeological discoveries, Contractor is advised that during the construction work, manual excavation may be required as well as any work necessary to ensure the protection of the discoveries. Contractor will be compensated according to the agreements.

6. PROTECTION OF REMAINS AND WORKS

a) Contractor shall take all reasonable precautions during excavations and construction work to protect the remains and to facilitate their examination by archaeologists. Parks Canada will not tolerate any derogation in this regard. If Contractor negligently spoils any vestige, the Contractor will be held responsible and the Ministry will consider the implications.

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

27. VERIFICATION OF ALIGNMENTS AND LEVELS

Contractor must provide the necessary labor so that the professional can verify the alignments and levels on site. At the request of the PCA Representative, Contractor must provide the necessary staff to assist the PCA Representative in the alignment and level verification. All levels and alignments must be connected (equal) to existing levels and alignments at the outside limit of the project, as specified on plans.

28. MATERIALS AND EQUIPEMENT

28.1. Supply and install materials and equipment of specified design and quality, showing performance in accordance with established standards and for which spare parts are readily available.

28.1.1. Manufacturer’s instruction

Unless otherwise specified, follow the manufacturer's most recent written instructions for materials and equipment to be used and for installation methods.

28.1.1.1.1. General fasteners

Provide metal fasteners and accessories of the same texture, color and finish as the metal backing to which they are attached. Prevent different metals from being exposed to electrolytic action. Use stainless steel fasteners, anchors and wedges to secure outdoor

structures.

Anchor spacing must consider limit load charges and shear strength to ensure permanent positive anchoring. Wooden dowels are not accepted.

Use as few visible fasteners as possible, space them evenly and lay them down carefully.

Fasteners that would cause the anchoring material to crumble or crack will not be accepted.

Obtain professional approval before using any fasteners installed with a nail gun. Once approval has been obtained, comply with CAN3-Z166-M85

28.1.1.2. Delivery and storage

Materials and equipment must be delivered and stored in proper order to maintain seal and manufacturer's label intact.

Prevent material and equipment from being damaged, altered or soiled during delivery, handling and storage. Rejected materials and equipment must be transported off site immediately.

Store materials and equipment in accordance with suppliers instructions.

Repair, to the satisfaction of the professional, any damage to factory finished surfaces. Use a primer or enamel that harmonizes with the original finish and approved by the professional. Do not paint the product nameplates.

28.1.1.3. Construction equipment and tools

When preparing the bid, Contractor must consider using the maximum machinery to complete the work as soon as possible while minimizing disruption to the sites.

At the site opening meeting, Contractor must provide the list of equipment he intends to use for the construction work. Following the approval of this list by the professional, the Contractor must not use any other equipment on the work site without the prior approval of the professional.

29. CIRCULATION

In the park and on the banks, heavy machinery and any other vehicles must only use access roads that can withstand their passage or any other access agreed upon with the PCA Representative before the work begins.

Contractor must take the necessary measures to ensure that the circulation of machinery and vehicles creates as little damage as possible to the minimum surface area of the work site.

30. CONCRETE INSTALLATION (October 15 to April 15)

From October 15 to April 15, the cement to be used will be high resistance - type HE.

31. ACCESS TO WORK

Contractor must limit circulation, storage of materials, etc. to the immediate areas of work. This is to protect existing plants and turf areas.

32. AS BUILT DRAWINGS

During construction work, Contractor will annotate in red, in way and when they are executed, all changes and modifications to the works on an additional copy of plans that will be given to the professional no later than at the moment of provisional acceptance of work. If Contractor does not make these modifications, the professional may have the statements executed by other professionals at the expense of Contractor.

33. SITE FURNISHING

Contractor will supply the following items: street lamps, concrete bases for street lamps, benches, litter bins, recycling bins, removable bollards type 2, bicycle racks, guardrails. Contractor is responsible for the installation of these elements. Parks Canada will provide Type 1 removable bollards, and fixed bollards including bollards for guardrails.

Payment procedure

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1.1 DESCRIPTION OF ITEMS IN PRICE SCHEDULE

.1 Landscape architecture – Demolition and site preparation

.1 Administrative expenses

.1 At item titled "Administrative expenses (site office including sanitary installations, traffic control and temporary signage, temporary utility services)", the Contractor must provide a fixed price, in the price schedule. The price includes but is not limited to:

.1 A site office including sanitary installations;

.2 Traffic control and temporary signage;

.3 Temporary utility services.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.2 Temporary protection fence

.1 At item titled « Supply and installation of temporary protection steel fence to secure the premises », the Contractor must provide a fixed price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation of all material necessary for installation of a protection fence.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.3 Existing tree and shrub protection

.1 At item titled « Existing tree and shrub protection », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation of all material necessary for protection of existing trees.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

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.4 Protection of elements to be preserved

.1 At item titled « Protection of elements to be preserved (canal retaining wall, old pylon, rail trail north of site) » the Contractor must provide a fixed price in price schedule. The price includes but is not limited to:

.1 Supply and installation of all material necessary for protection of elements to be preserved.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.5 Removal of a section from guardrails - southern approach, including concrete base

.1 At item titled « Removal of a section from guardrails - southern approach, including concrete base», the Contractor must provide a price per linear meter, in price schedule. The price includes but is not limited to:

.1 Excavation;

.2 Removal of concrete bases, and their off-site transportation;

.3 Backfilling of holes left by removal - as specified on plans and specifications;

.4 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.6 Removal of concrete base – northern approach

.1 At item titled « Removal of concrete base – northern approach », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Excavation;

.2 Removal of concrete bases, and their off-site transportation;

.3 Backfilling of holes left by removal - as specified on plans and specifications;

.4 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.7 Removal of traffic sign including concrete base and delivery to Parks Canada

.1 At item titled « Removal of traffic sign including concrete base and delivery to Parks Canada» the Contractor must provide a fixed price in price schedule. The price includes but is not limited to:

.1 Excavation;

.2 Removal of concrete bases, and their off-site transportation;

.3 Backfilling of holes left by removal - as specified on plans and specifications;

.4 Removal of traffic signs and delivery to Parks Canada;

.5 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.8 Removal of fixed protection bollards including concrete base and storage

.1 At item titled « Removal of fixed protection bollards including concrete base and storage », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Excavation;

.2 Removal of concrete bases, and their off-site transportation;

.3 Backfilling of holes left by removal - as specified on plans and specifications;

.4 Removal of fixed protection bollards and storage for reinstallation;

.5 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.9 Asphalt removal

.1 At item titled « Asphalt removal », the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Removal of asphalt surfaces, including granular foundations ;

.2 Off-site transportation and disposal of excavation material;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.10 Saw cut in asphalt at junction with existing multi-use pathway

.1 At item titled « Saw cut in asphalt at junction with existing multi-use pathway», the Contractor must provide a price per linear meter, in price schedule. The price includes but is not limited to:

.1 Saw cuts;

.2 Off-site transportation and disposal of excavation material;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.11 Removal of precast concrete pavers; cleaning and storage on pallets, delivery to Parks Canada

.1 At item titled « Removal of precast concrete pavers; cleaning and storage on pallets, delivery to Parks Canada», the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Removal of precast concrete paver surfaces, including granular foundations ;

.2 Cleaning and storage on pallets for delivery to Parks Canada;

.3 Off-site transportation and disposal of excavation material;

.4 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.12 Excavation and preparation of infrastructure for hard surfaces

.1 At item titled « Excavation and preparation of infrastructure for hard surfaces», the Contractor must provide a per cubic meter price, in the price schedule. The price includes but is not limited to:

.1 Excavation to depths - as specified on plans an specifications;

.2 Off-site transportation and disposal of excavation material;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.13 Excavation of tree pits

.1 At item titled « Excavation of tree pits », the Contractor must provide a per cubic meter price, in the price schedule. The price includes but is not limited to:

.1 Excavation to depths - as specified on plans an specifications;

.2 Off-site transportation and disposal of excavation material;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.14 Excavation of planting beds for shrubs and perennials, and ornemental grasses

.1 At item titled « Excavation of planting beds for shrubs and perennials, and ornemental grasses », the Contractor must provide a per cubic meter price, in the price schedule. The price includes but is not limited to:

.1 Excavation to depths - as specified on plans an specifications;

.2 Off-site transportation and disposal of excavation material;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.2 Landscape architecture – Hard surfaces

.1 Precast concrete pavement surface type 1 - Mega Paleo red (including granular foundation, geotextile, polymer sand)

.1 At item titled « Precast concrete pavement surface type 1 - Mega Paleo red (including granular foundation, geotextile, polymer sand) », the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Granular foundation, geotextile, polymer sand;

.2 Supply and installation of precast concrete pavers;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.2 Precast concrete pavement surface type 2 - Mega Paleo grey Stanstead (including granular foundation, geotextile, polymer sand)

.1 At item titled « Precast concrete pavement surface type 2 - Mega Paleo grey Stanstead (including granular foundation, geotextile, polymer sand) », the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Granular foundation, geotextile, polymer sand;

.2 Supply and installation of precast concrete pavers;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.3 Precast concrete pavement surface type 3 – Boulevard TLI 100 light grey (including granular foundation, geotextile, polymer sand)

.1 At item titled « Precast concrete pavement surface type 3 – Boulevard TLI 100 light grey (including granular foundation, geotextile, polymer sand) », the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Granular foundation, geotextile, polymer sand;

.2 Supply and installation of precast concrete pavers;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.4 Retaining aluminium edge - type Asphalt Edge (76mm x 76mm) natural grey - from Permaloc company or approved equivalent

.1 At item titled « Retaining aluminium edge - type Asphalt Edge (76mm x 76mm) natural grey - from Permaloc company or approved equivalent », the Contractor must provide a per linear meter price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation of retaining edge;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.5 Crushed granite stone surface - color: northern grey (gris du nord) - or approved equivalent (Including granular foundation and geotextile)

.1 At item titled « Crushed granite stone surface - color: northern grey (gris du nord) - or approved equivalent (Including granular foundation and

geotextile) », the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Granular foundation and geotextile;

.2 Supply and installation of crushed granite stone;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.3 Landscape architecture – Pavement markings

.1 DecoMark® type pavement marking or approved equivalent - Small Arrows

.1 At item titled « DecoMark® type pavement marking or approved equivalent - Small Arrows », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Templates, supply and installation of pavement markings;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.2 DecoMark® type pavement marking or approved equivalent - Large Arrows

.1 At item titled « DecoMark® type pavement marking or approved equivalent – Large Arrows », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Templates, supply and installation of pavement markings;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

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.3 PreMark® Type Pavement marking or approved equivalent - Central Line

.1 À l'article intitulé « Marquage de chaussée de type PreMark® ou équivalent approuvé - Ligne centrale», the Contractor must provide a per linear meter price, in the price schedule. The price includes but is not limited to:

.1 Templates, supply and installation of pavement markings;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.4 Landscape architecture – Site furnishings

.1 Supply and installation of backless bench

.1 At item titled « Supply and installation of backless bench », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.2 Supply and installation of litter bin

.1 At item titled « Supply and installation of litter bin », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

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.3 Supply and installation of recycling bin

.1 At item titled « Supply and installation of recycling bin », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.4 Supply and installation of bike rack

.1 At item titled « Supply and installation of bike rack », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.5 Supply and installation of removable protection bollards type 1 (Lea Roback street)

.1 At item titled « Supply and installation of removable protection bollards type 1 (Lea Roback street) », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.6 Supply and installation of removable protection bollards type 2 (footbridge)

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.1 At item titled « Supply and installation of removable protection bollards type 2 (footbridge) », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.7 Reinstallation of fixed protection bollards

.1 At item titled « Reinstallation of fixed protection bollards », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Recuperation of stored bollards;

.2 Installation, including all hardware parts;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.8 Reinstallation of existing traffic sign

.1 At item titled « Reinstallation of existing traffic sign », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Recuperation of traffic sign;

.2 Installation, including all hardware parts;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.9 Supply and installation of railing for guardrail (2m)

.1 At item titled « Supply and installation of railing for guardrail (2m) », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.10 Installation of posts (bollards) for guardrail

.1 At item titled « Installation of posts (bollards) for guardrail », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Reclamation of posts (bollards) provided by Parks Canada :

.2 Installation, including all hardware parts;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.11 Supply and installation of posts and traffic signs

.1 At item titled « Supply and installation of posts and traffic signs », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation, including all hardware parts;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.5 Landscape architecture – Planting work

.1 Deciduous trees, shrubs, perennials and ornemental grasses

.1 At items titled « Deciduous trees, shrubs, perennials and ornemental grasses », the Contractor must provide a per unit price, in the price schedule. The price includes but is not limited to:

.1 Supply, installation of soil mixes, mulch, staking and watering;

.2 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.6 Landscape architecture – Sodding

.1 Sodding

.1 At item titled « Sodding », the Contractor must provide a per square meter price, in the price schedule. The price includes but is not limited to:

.1 Supply and installation of sod :

.2 Supply and installation of 150 mm of topsoil and of fertilizer ;

.3 All other related work required to complete works as specified in plans and specifications.

.2 Payment of this item will be made according to work progress, as approved by the PCA Representative.

.7 Landscape architecture – Maintenance work

.1 First year maintenance

.1 At item titled « First year maintenance », the Contractor must provide a fixed price, in the price schedule. Price must correspond to a minimum of 15% of planting work cost.

.8 Civil

.1 Concrete slab

.1 At Item entitled "Concrete slab (bench, wastebasket, etc.)", the Contractor shall provide a price per square meter for the concrete slab construction. The price includes, but is not limited to, the following:

.1 The supply and installation of all materials necessary for the construction of concrete slabs, including excavation, bedding, wire mesh and/or reinforcement, sawing, formwork and connection to existing structures, etc.

.2 The Contractor shall refer to the Landscape Plans and Specifications for the dimensions and finishes of the slabs.

.3 Protection of the slabs in an adequate manner to ensure their curing and prevent the formation of cracks or breaks; all in compliance with the requirements of the engineer and/or laboratory.

.4 The resumption of all the non-compliant sections.

.5 All other related work required to be completed, as specified in the plans and specifications.

.2 Payment for this item will be made according to the progress of the work, as approved by the PCA Representative.

.2 Guardrail concrete base

.1 At Item entitled "Guardrail concrete base", the Contractor shall provide a unit price for the construction of a concrete base. The price includes, but is not limited to, the following:

.1 Excavation, shoring, supporting, backfilling and compaction from the trench to the infrastructure line, including off-site transportation of surplus materials.

.2 Supply and installation of all necessary materials for the construction of concrete bases.

.3 All other related work required to be completed, as specified in the plans and specifications.

.2 Payment for this item will be made according to the progress of the work, as approved by the PCA Representative.

.3 Infrastructure preparation for the multi-purpose runway and pedestrian areas

.1 At Item entitled "Infrastructure preparation...", the Contractor shall provide a price per square meter for the excavation, backfilling and preparation of the multi-use runway infrastructure and pedestrian areas. The price includes, but is not limited to, the following:

.1 Excavation and backfilling required for levelling and compacting the infrastructure including loading, transporting and disposing of surplus or required materials.

.2 Infrastructure compaction.

.3 Repair of unstable surfaces (frost boils).

.4 All other related work required to be completed, as specified in the plans and specifications.

.2 The payable area corresponds to the finished surface area (paving, paving stone, stone dust, etc.).

.3 Payment for this item will be made according to the progress of the work, as approved by the PCA Representative.

.4 Granular foundation

.1 At Item entitled "Granular Foundation", the Contractor shall provide a price per square meter for the construction of the granular foundation. The price includes, but is not limited to, the following:

.1 Supply, transport and installation of granular materials as specified.

.2 Transition of granular materials when connecting to existing pavement.

.3 Spreading in layers of uniform thickness not exceeding 300 mm.

.4 Compaction of granular materials and bearing capacity test.

.5 Final levelling of the upper foundation.

.6 All other related work required to be completed, as specified in the plans and specifications.

.2 The payable area corresponds to the finished surface area (paving, paving stone, stone dust, etc.).

.3 Payment for this item will be made according to the progress of the work, as approved by the PCA Representative.

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.5 EC-10 asphalt mix, 50 mm thick

.1 At Item entitled "Asphalt pavement...", the Contractor shall provide a price per square meter for the supply and installation of the asphalt pavement of the multipurpose roadway. The price includes, but is not limited to, the following:

.1 Supply, transport and installation of asphalt concrete as specified.

.2 Cylindrating, pounding, levelling, priming asphalt and final adjustment of the top foundation and existing and projected structures (manholes, sumps, valve boxes, valve chambers, etc.) at the paving level and all work necessary to bring the asphalt surface up to specifications.

.3 Connection to the existing system including saw cuts to the required thickness.

.4 Layer spreading of uniform thicknesses not exceeding the requirements of the specification.

.5 Compaction of asphalt mix.

.6 Adjustment of existing and projected structures (manholes, sumps, valve boxes, valve chambers, etc.) at the paving level.

.7 All other related work required to be completed, as specified in the plans and specifications.

.2 Payment for this item will be made according to the progress of the work, as approved by the PCA Representative.

.6 Management of contaminated soils

.1 At Item entitled "Management of Contaminated Soils", the Contractor shall provide a price per metric ton for the loading, transportation and disposal of contaminated soils. The price includes, but is not limited to, the following:

.1 On-site temporary storage.

.2 Truck loading and transportation.

.3 Transportation and disposal of contaminated excavated material from the work site to the MDDELCC approved disposal site.

.4 Cleaning the truck dump box, if required, is an integral part of the price. The quantity will be calculated from the weight tickets.

.5 All other related work required to be completed, as specified in the plans and specifications.

.2 Payment for this item will be made according to the progress of the work, as approved by the PCA Representative.

.9 Electrical

.1 Aluminum pole for lamp post

.1 At item entitled “Aluminum pole for lamp post”, the Contractor shall provide a unit price that includes the supply and installation of each aluminum pole. The price includes, but is not limited to, the following:

.1 Supplying and installing a pole including accessories such as the identification plate, footing, base cover, lug, anchor bolts, etc.

.2 Supplying, installing and wiring connection inside the pole for the luminaire, fuse holders, fuses, and splices.

.3 Supplying and installing the banners holders.

.4 Final adjustments to ensure pole verticality.

.5 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.2 Decorative luminaire

.1 At item entitled “Decorative luminaire”, the Contractor shall provide a unit price that includes the supply and installation of each luminaire. The price includes, but is not limited to, the following:

.1 Supplying and installing a luminaire including required accessories.

.2 Connecting the luminaire.

.3 Adjustment the luminaire.

.4 Cleaning the luminaire.

.5 Indicate the installation date.

.6 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.3 Concrete Base

.1 At item entitled “Concrete Base”, the Contractor shall provide a unit price for the construction of concrete base. The price includes, but is not limited to, the following:

.1 Excavating.

.2 Shoring trench, controlling water and supporting nearby structures.

.3 Preparing the bed.

.4 Constructing of the mound around the concrete base, if required.

.5 Supplying and installing the concrete bases, poured on site (including the anchor bolts, encased ducts and reinforcements) or the prefabricated base.

.6 Backfilling and compacting.

.7 Disposing of extra excavated material and/or waste.

.8 Final levelling and adjustments to the concrete base.

.9 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

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.4 Trench without paving

.1 At item entitled “Trench without paving”, the Contractor shall provide a price per linear metre for the construction of trenches. The price includes, but is not limited to, the following:

.1 Retaining and protecting work areas.

.2 Supporting and protecting public utilities.

.3 Protecting trees, shrubs and fences.

.4 Excavating, drying of trench and encasing.

.5 Backfilling and installing signalling tape.

.6 Compacting.

.7 Removal of extra/unusable excavated materials of site.

.8 The management of contaminated soils according to section 01 35 13.43.

.9 The costs to management of contaminated soils are paid in the Civil.

.10 The coordination with the other disciplines.

.11 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.5 Trench under paving

.1 At item entitled “Trench under paving”, the Contractor shall provide a price per linear metre for the construction of trenches. The price includes, but is not limited to, the following:

.1 Retaining and protecting work areas

.2 Supporting and protecting public utilities.

.3 Protecting trees, shrubs and fences.

.4 Excavating, drying of trench and encasing.

.5 Backfilling and compacting up to the infrastructure.

.6 Installing signalling tape.

.7 Removal of extra/unusable excavated materials of site.

.8 The management of contaminated soils according to section 01 35 13.43.

.9 The costs to management of contaminated soils are paid in the Civil.

.10 The coordination with the other disciplines.

.11 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.6 PVC Conduit – 53 mm

.1 At item entitled “PVC Conduit - 53 mm”, the Contractor shall provide a price per linear metre for supplying and installing PVC conduits. Conduits are measured parallel to the trench, from the centre of one concrete base to the centre of the next. The price includes, but is not limited to, the following:

.1 Supplying and installing rigid PVC conduits with the diameter indicated on the schedule.

.2 Cleaning of the conduit, passing a mandrel and stiff bristle brush, and installing a 6 mm nylon cable for pulling conductors or cables.

.3 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.7 Conductors RWU

.1 At item entitled “Conductors RWU”, the Contractor shall provide a price per linear metre for supplying and installing conductors. The price includes, but is not limited to, the following:

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.1 Supplying and installing RWU-90 conductors in ducts, with caliber as indicated on plans.

.2 Measuring to be from one base centre to another.

.3 An additional 3 metres per rise for each cable in a concrete base.

.4 An additional 1 metre for each cable passing through a pull box or junction box.

.5 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.8 Pull or junction box at ground level

.1 At item entitled “Pull or junction box at ground level”, the Contractor shall provide a unit price for supplying and installing box. The price includes, but is not limited to, the following:

.1 Excavating.

.2 Construction of the support cushion.

.3 Supplying and installing the box.

.4 Backfilling and compacting.

.5 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.9 Anti-Theft Device

.1 At item entitled “Anti-Theft Device”, the Contractor shall provide a unit price for installing an anti-theft device within lamp posts. The price includes, but is not limited to, the following:

.1 Supplying and installing a steel plate and neoprene protection.

.2 Supplying and installing nuts and bolts.

.3 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.10 Lamp post to be removed

.1 At item entitled “Lamp post to be removed”, the Contractor shall provide the slip with a unit price for dismantling a lamp post. The price includes, but is not limited to, the following:

.1 Disconnecting power conductors.

.2 Removing the street lamp and dismantling it into its various parts (post, davit, light fixture).

.3 Removing conductors inside the lamp post.

.4 Removing the various components (lamp, fuse holder, fuses).

.5 Storing the street lamp (post, davit, light fixture) at the location determined by Parks Canada or its removal from the site.

.6 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.11 Concrete Base to be removed

.1 At item entitled “Concrete Base to be removed”, the Contractor shall provide a unit price for removing concrete base. The price includes, but is not limited to, the following:

.1 Excavating.

.2 Sectioning ducts.

.3 Removing the concrete base and transporting it off site by the Contractor. It's not Parks Canada intention to recover the concrete bases.

.4 Backfilling the hole resulting from its removal and compacting.

.5 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.12 Works on the existing wood pole with lighting projectors

.1 At item entitled “Works on the existing wood pole with lighting projectors”, the Contractor shall provide a lump sum price. The price includes, but is not limited to, the following:

.1 The disconnection of lighting projectors, removal of conductors, installing aluminum conduits and elbows, fasteners, protective plate, conductors connections to protection devices of lighting projectors on post, new watertight splices, all equipments and accessories required for a complete, functional and safe installation.

.2 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

.13 Electrotechnical Testing

.1 At item entitled “Electrotechnical Testing”, the Contractor shall provide a lump-sum price. The price includes, but is not limited to, the following:

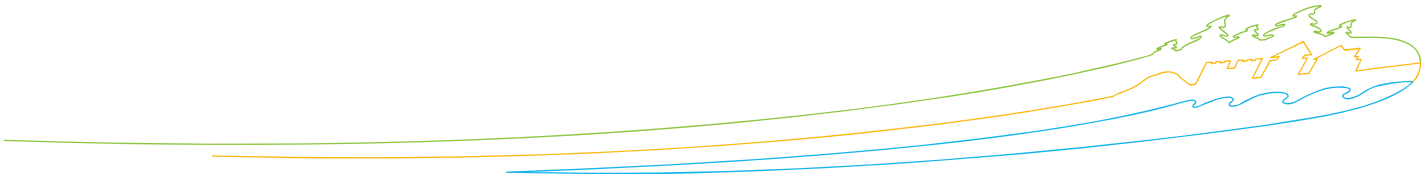
.1 Ensuring verifications are performed by an independent firm, as required in the specifications, including the necessary equipment.

.2 Issuing a report and performing additional inspections.

.3 All other related work required to complete the work as specified in the plans and specifications.

.2 Payment of this item will be made based on the progress of the work, as approved by Parks Canada Representative.

Parcs Canada Parks Canada



LANDSCAPE ARCHITECTURE SECTION – ISSUED FOR TENDER

Securing of multi-use pathway of Lachine Canal national historic site, Montreal

APPROACHES TO SIR GEORGES-ETIENNE-CARTIER FOOTBRIDGE

Parks Canada Agency

November 09, 2018

Canada

PARKS CANADA

Lachine Canal National Historic Site

Multi-use pathway of Lachine Canal

TECHNICAL SPECIFICATIONS

FILE : 16-0459.02

DATE : November 09, 2018

Prepared by : _____
Marie-Ève Parent, landscape architect

Approved by: _____
Lucie St-Pierre, landscape architect

PART 1- GENERAL

1.1 Scope of section

This section specifies general requirements and procedures for submission of shop drawings, product descriptions and samples by Contractor to the PCA Representative for verification. Other additional special requirements are formulated in appropriate sections of other divisions.

Do not proceed with work affected by submittal until review is complete by PCA Representative.

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

Where items or information is not produced in SI Metric units converted values are acceptable.

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

When submitting documents or samples, notify the PCA Representative in writing of the deviations from the requirements of the contract documents, stating the reasons for the deviations.

Contractor will not be released from any liability for deviations from the Contractual Requirements, even if the Parks Canada representative has verified the submitted documents or samples, except in the event that the Parks Canada representative agrees in writing to a particular modification.

Make any and every change that the PCA Representative deems appropriate with respect to the Contract Documents and resubmit the documents or samples as directed by the Parks Canada Representative.

When resubmitting documents or samples, notify the PCA Representative in writing of changes made other than those required by the Parks Canada Representative.

1.2 Administrative

.1 As soon as possible and in a predetermined order so as not to cause delay in work, submit the required documents and samples to the PCA Representative for approval. Failure to submit in ample time is not considered sufficient reason for extension of contract time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with work affected by submittal until review is complete.

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

.4 Where items or information is not produced or indicated in SI Metric units, converted values are acceptable.

.5 Examine documents and samples before handing them to the PCA Representative. With this pre-verification, the Contractor confirms that the requirements applicable to the work have been or will be determined and verified, and that each of the documents and samples submitted has been examined and found to comply with the requirements of the Work and the Contract Documents. Documents and samples that are not stamped, signed, dated and identified in connection with the particular project will be returned unreviewed and will be considered rejected.

.6 Notify PCA Representative in writing at time of submission, identifying deviations from requirements of contract documents stating reasons for deviations.

.7 Verify field measurements and affected adjacent work are co-ordinated.

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

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

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

1.3 Shop drawings and product data

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work. Maximum dimension of sheets: 594 X 841 mm (A1).

.2 Shop drawings must indicate materials to be used and methods of construction, attachment or anchorage to be used and must contain erection diagrams, connections, relevant explanatory notes and any other information necessary for completion of the works. Where articles or elements attach or connected to other structures or other elements, indicate in the drawings that such items have been coordinated, regardless of the section under which the adjacent structures or elements will be supplied and installed. Refer to the specifications and draft design drawings.

.3 Allow 5 business days to the PCA Representative to review each batch of submitted documents.

.4 If no shop drawing is required due to the use of a standard product, submit the manufacturer's data sheets or manufacturer's documentation as specified in the technical sections of the specifications and required by the PCA Representative.

.5 Changes to shop drawings by the PCA Representative are not intended to modify the contract price. If this is the case, however, notify the PCA Representative in writing before proceeding with the work.

.6 Standard manufacture production: submit computer file of manufacturer's data sheets or documentation, as specified in technical sections of these specifications and as required by PCA Representative.

.7 Submit a computer file of the test reports prescribed in the technical sections of the specifications and required by the PCA Representative.

.1 The report signed by the official representative of the test laboratory must certify that materials, products or systems identical to those proposed in the work have been tested in accordance with the prescribed requirements.

.2 Tests must have been performed in the year preceding the date of contract award.

.8 Submit a computer file of the certificates prescribed in the technical sections of the specifications and required by the PCA Representative.

.1 Documents, printed on the manufacturer's official letterhead and signed by a manufacturer’s representative, must certify that the products, materials, equipment and systems supplied comply with the prescribed specifications.

.2 Certificates must be dated after award of contract and indicate project designation.

.9 Submit a computer file of the manufacturer's instructions prescribed in the technical sections of the specifications and required by the PCA Representative.

.1 Pre-printed documents describing the installation method for products, equipment and systems, including special notices and material safety data sheets indicating impedances, risks and safety measures to be implemented.

.10 In addition to current information, provide any additional details that apply to the work.

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

proceed.

.12 Review of shop drawings is done for the sole purpose of ascertaining conformance with general concept.

This review does not mean that the PCA Representative approves the detailed draft design inherent in the shop drawings. These remain the responsibility of the Contractor who submits them. This does not release the Contractor from the obligation to transmit full and accurate shop drawings.

Contractor must comply with all the requirements of the work and the contract documents.

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

1.4 Samples

.1 Submit for review samples in duplicate as requested in respective specification sections. Label samples with origin and intended use.

.2 Deliver samples prepaid to PCA Representative's site office.

.3 Notify PCA Representative in writing, at time of submission of deviations in samples from requirements of contract documents.

.4 Where colour, pattern or texture is criterion, submit full range of samples.

.5 Adjustments made on samples by PCA Represantative are not intended to change contract price. If adjustments affect value of work, state such in writing to PCA Representative prior to proceeding with work.

.6 Make changes in samples which PCA Representative may require, consistent with contract documents.

.7 Reviewed and accepted samples will become standard of workmanship and material against which installed work will be verified.

1.5 Mock-ups

.1 When specified in documents, erect mock-ups in accordance with plans and/or specifications (other section).

PART 2- **PRODUCTS**

2.1 Not used .1 Not used

PART 3 - **EXECUTION**

3.1 Not used .1 Not used

END OF SECTION

PART 1. GENERAL

1.1 Scope

.1 This section describes the requirements for the demolition, salvage, recycling and complete or partial removal of various elements indicated on plans or required to carry out the new construction work, as well as the backfilling of trenches and excavations resulting from this work. It also includes site cleaning and off-site disposal of all debris.

1.2 Related requirements

.1 Section 31 23 10 – Excavating, trenching and backfilling

.2 Section 31 14 11 – Rough grading

1.3 Measurement and payment

.1 Measurement of final levelling adjustment and cleaning work consists in verifying that the work complies with requirements on plans, details and these specifications.

.2 Site preparation work must be included in the most representative articles of the bidding form.

.3 The owner does not make any separate payment for final levelling adjustment and cleaning. Contractor must include that cost in the item referring to demolition and site preparation of the bid form and price schedule. Contractor will not be able to claim any additional remuneration for this work.

1.4 References

.1 Canadian Council of Ministers of the Environment (CCME)
- .1 PN1327, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.

.2 Department of Justice Canada
- .1 Canadian Environmental Assessment Act (CEAA), 1997, c. 37
- .2 Canadian Environmental Protection Act (CEPA), 1999, c. 33

.3 Health Canada - Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS)

.4 Transports Canada (TC).
- .1 Transportation of Dangerous Goods Act, 1992, c. 34.

1.5 Definitions

.1 Demolition: rapid destruction of building following removal of hazardous materials.

.2 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable

substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

.3 Waste Audit : Detailed statement of products and materials of which a building is constituted.

.1 Audit of waste includes evaluation, by volume and mass, of the quantities of materials and waste generated by deconstruction.

.2 Quantities of materials reused, recycled and landfilled must be indicated separately.

1.6 Delivery, storage and handling

.1 Storage and protection

.1 Protect in accordance with Section 31 23 10 - Excavating, Trenching and Backfilling.

.2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of PCA Representative and at Contractor's cost.

.3 Remove and store materials to be salvaged, in manner to prevent damage.

.4 Store and protect in accordance with requirements for maximum preservation of material.

.5 Handle salvaged materials as new materials..

.2 Waste management

.1 Separate and recycle waste and return to appropriate recycling facilities.

.2 Place in designated containers substances that meet the definition of toxic or hazardous waste and transport to an approved hazardous materials collection site.

.3 Remove from site all packaging materials and return to appropriate recycling facilities.

.4 Transport unused metal components to a recognized metal recycling facility.

.5 Materials that can not be reused must be removed from site and disposed of in approved facilities as required by applicable codes.

1.7 Site conditions

.1 Site environmental requirements

.1 Refer to the Environmental Impact Assessment (EIA) template that will be provided to the Contractor by the PCA Representative at project kick-off meeting.

.2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.

.3 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.

.1 Ensure proper disposal procedures are maintained throughout the project.

.4 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.

.5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities.

.6 Protect trees, plants and foliage on site and adjacent properties where indicated.

PART 2. PRODUCTS

2.1 Equipment

.1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

2.2 Protection fence

.1 Use throughout all construction period, "Protec" type temporary protection fence - 1.8 meter high (6 ') or approved equivalent at site perimeter.

PART 3. EXECUTION

3.1 Preparation

.1 Inspect site with PCA Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

.3 Notify and obtain approval of utility companies before starting demolition.

3.2 Removal of hazardous wastes (contaminated soil)

.1 Remove contaminated or dangerous materials defined by authorities having jurisdiction, relating to environmental protection, from site and dispose of in safe manner to minimize danger at site or during disposal.

3.3 Removal operations

.1 Remove items as indicated.

.2 Do not disturb items designated to remain in place

.3 Removal of pavements, curbs and gutters:

.1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by PCA Representative.
.2 Protect adjacent joints and load transfer devices.
.3 Protect underlying and adjacent granular materials.

.4 Prevent contamination with base course aggregates, when removing asphalt pavement for subsequent incorporation into hot mix asphalt concrete paving,

.5 Removal of concrete pavers:
.1 Delimit surfaces to remain in place by cutting them at right angles; use a saw or other method approved by the PCA Representative.
.2 Stack on pallets to be returned to Parks Canada.
Delivery address for storage is:
1150 Mill street
Montreal, QC
H3K 2B3

.6 Excavate at least 300mm below pipe invert, when removing pipes under existing or future pavement area.

.7 Decommission water wells and monitoring wells in accordance with municipal and provincial regulations.

.8 Remove designated trees during demolition. Obtain written approval of PCA Representative prior to removal of trees not designated.

.9 Grind, chip, or shred other vegetation for mulching and composting.

.10 Stockpile topsoil for final grading and landscaping:
.1 Provide erosion control and seeding if not immediately used.

.11 Salvage
.1 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as indicated.

.12 Disposal of material:
.1 Dispose of materials not designated for salvage or reuse on site as instructed by PCA Representative at authorized facilities.

.13 Backfill:
.1 Backfill in areas as indicated and in accordance with section 31 23 10 - Excavating, Trenching and Backfilling.

3.4 Removal from site

.1 Remove stockpiled material as directed by PCA Representative when it interferes with operations of project.

.2 Remove stockpiles of like materials by alternate ecological disposal option once collection of materials is complete.

.3 Transport material designated for alternate ecological disposal using approved facilities or receiving organizations in accordance with applicable regulations.

.4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations

.1 Approved disposal Facilities.

3.5 Restoration

.1 Restore areas and existing works outside areas of demolition to conditions that existed prior to beginning of work.

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

3.6 Cleaning

.1 Upon completion or work, remove surplus materials, rubbish, tools and equipment and leave work area clean.

.2 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

END OF SECTION

PART 1. GENERAL

1.1 Description

.1 The Contractor will provide, in compliance with plans and other documents, all material and materials, equipment and labour required to perform the earthworks for the entire project such as:

.1 The provision of a sealed (stamped) plan from a land surveyor who certifies all the steps of the earthworks, demonstrating that the implementation of all structures and grades are in compliance with the plans issued for construction;

.2 Excavation and backfill, including supply of backfill if required;

.3 Contaminated soil management;

.4 Stripping of grass or surface layer;

.5 On site re-use and re-installation of materials deemed to comply;

.6 Recycling or off-site disposal of non-reusable materials;

.7 Patching and levelling with adjacent surfaces.

1.2 Related requirements

.1 The Contractor is responsible for obtaining a copy of all sections of this specification even if it seems irrelevant to his specialty, otherwise he will be acknowledged to accept the clauses and requirements of all sections of this specification. The specialized subcontractor must consult the table of contents of this specification for the complete list of specification sections.

1.3 References

.1 CSA International

.1 CSA A23.1/A23.2-F09, Concrete - Components and Execution of Work / Tests and Standard Practices for Concrete.

.2 Ministry of Transport, Sustainable Mobility and Transport Electrification:

.1 Specifications and general specifications (CCDG): road infrastructures, 2010 edition.

.3 Ministry of Sustainable Development, Environment, and Action against Climate Change

.1 Soil Protection and Contaminated Sites Rehabilitation Policy

1.4 Related requirements

.1 Section 32 91 21 – Topsoil placement and fine grading

1.5 Regulation

.1 Support and brace excavations, protect slopes and embankments and perform all work in accordance with the most stringent requirements of provincial and municipal regulations.

1.6 Tests and inspections

.1 Material testing and compaction of backfill and fill materials will be performed by a laboratory designated by the PCA Representative.

.2 PCA Representative must approve the proposed material for backfilling or infilling before the execution of the work.

.3 No later than 48 hours prior to backfilling or filling with approved material, notify PCA Representative of this incoming work so that Contractor can proceed with compaction tests.

.4 Before commencing work, verify in the presence of the PCA Representative, the condition of buildings, trees and other plants, lawns, fences, utility poles, cables and hard surfaces, boundary markers, existing benchmarks that could be affected by the work.

1.7 Underground utility networks

.1 Before commencing work, verify location of all underground utilities on or near site. The Contractor must present a request to Info-Excavation at least 15 business days before commencing work.

.2 If necessary, the Contractor must make arrangements with the appropriate authorities to relocate the underground utilities that interfere with the performance of the work. The Contactor shall cover the cost of relocation.

.3 Remove obsolete underground pipes within 2 m of foundations and close cut sections with appropriate plugs.

1.8 Protection

.1 Protect excavations against freezing.

.2 Keep excavations clean, free from standing water and loose materials.

.3 Where the soil can vary significantly in volume due to fluctuations in moisture content, cover and protect it to the satisfaction of the PCA Representative.

.4 Protect natural or built elements which must remain intact. Unless otherwise indicated or unless not located in work area, protect trees from damage in compliance with section 32 01 91 Tree and shrub

preservation.

.5 Protect utility lines that must remain in place.

PART 2. PRODUCTS

2.1 Materials

.1 MG20 aggregate materials and sand must be in compliance with CCDG (Ministry of Transport, Sustainable Mobility and Transport Electrification – CCDG – in french).

.2 PCA Representative must approve material for excavation or grading prior to their use as grading material. Do not use contaminated soil. Protect these approved materials from contamination.

PART 3. EXECUTION

3.1 Clearing and grubbing

.1 Clear areas indicated on plans from dead wood, trees, stumps, logs, brush, shrubs, vines, dead vegetation, loose boulders and debris.

.2 Remove stumps and roots from trees under footings, slabs and hard surfaces; at other locations, remove them to a depth of 1000 mm below the final ground level.

.3 Dispose daily of excavated material and other extracted materials at a disposal site accepted by the competent authority.

3.2 Excavation

.1 Sort contaminated soils in compliance with current procedures and standards.

.2 Remove topsoil covering areas to be occupied by a new structure, areas where level changes are to be made, and areas where excavated material is to be stockpiled. Do not move topsoil when it is wet or frozen.

.3 Carry out excavation work necessary for the execution of earthworks, regardless of materials encountered. Do not disturb ground or rock below the bearing surfaces. Inform the PCA Representative of completion of the excavation work. If the bearing capacity of ground is unsatisfactory, additional excavation work will be authorized in writing and paid for by the terms established for additional work.

.4 Dig trenches in order to provide uniform and continuous support and lift to a 150 mm thick layer of pipe-laying material over solid, undisturbed soil. Width at the bottom of trenches, up to a height of 150 mm above the pipes, shall not exceed the diameter of those

pipes by more than 600 mm.

.5 For slabs and hard surfaces, excavate to the infrastructure level. Remove topsoil, organic material, debris and other loose or harmful materials encountered at this level.

3.3 Backfilling

.1 Clean fill materials from an approved site that complies with the laws and regulations of the Ministry of Sustainable Development, Environment and Action against Climate Change regarding soil protection and remediation of contaminated land.

.2 Do not commence backfilling until fill material and fill areas have been inspected and approved by the PCA Representative.

.3 Harmful Substances: clear backfill areas of snow and ice, construction debris, organic material and standing water.

.4 Lateral support: arrange the backfill uniformly on both sides of the works as work progresses, so as to equalize the soil pressure.

.5 Compaction of infrastructure: compact existing infrastructure under pedestrian walkways, hard surfaces and ground level slabs until the density required for filler materials is achieved. Fill the excavated areas with materials specified on plans. Compact until density is achieved for filler materials.

.6 Installation: Spread backfill, fillers and foundations materials in layers 150 mm thick. Add the amount of water required to obtain the specified density.

.7 Compacting: compact each layer of material until density indicated in the drawings is achieved.

.8 Sod or seeded areas: use excavation material up to topsoil level, except in trenches and within 600 mm of foundations.

.9 Materials obtained by explosives, which are not suitable for final grading, are not acceptable and must be covered with new filler materials.

.10 Foundations (except for trenches, under slabs and hard surfaces): use excavation or new filler materials containing no stone greater than 200 mm in diameter, when at less than 600 mm from works.

3.4 Grading

.1 Perform grading work so that water does not flow toward walls and hard surfaces, but is directed towards sumps and other drainage structures approved by the PCA Representative. Level the ground by giving it a gradual slope between the different grades, as indicated on drawings.

3.5 Required or surplus materials

.1 Provide all fill materials required for backfilling and levelling work, within plus or minus approved tolerances, for general earthworks.

.2 Dispose of excess material from construction site.

3.6 Measurement for payment

.1 Measurement of earthworks/rough grading consists in verifying that these works are in conformity with the requirements of the plans, details and these specifications.

.2 Earthworks must be included in the most representative articles of the bid price schedule.

.3 Parks Canada does not make separate payments for earthworks. The Contractor must include all cost in the articles related to demolition and site preparation of the bid price schedule. The Contractor will not be able to claim any additional remuneration for this work.

END OF SECTION

Tree and shrub preservation

Issued for tender 2018-11-09

PART 1. GENERAL

1.1 Scope

.1 Products and methods for fertilizing and preserving the root system and aerial parts of existing plants affected by excavation and soil level changes.

1.2 Related requirements

.1 General requirements

.2 Technical requirements

.3 Section 02 41 13 – Selective site demolition

.4 Section 32 91 21 – Topsoil placement and fine grading

.5 Section 32 92 23 - Sodding

.6 Section 32 93 10 – Tree and shrub planting

1.3 References

.1 Bureau de Normalisation du Quebec (BNQ)
- .1 NQ 0605-100 Aménagement paysager à l'aide de végétaux (Landscaping with plants).
- .2 NQ 0605-200 Entretien arboricole et horticulture (Tree and horticulture maintenance).

.2 CSA Group
- .1 CSA G30.18-09, Carbon Steel Bars for Concrete Reinforcement.

.3 Department of Justice Canada (Jus)
- .1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
- .2 Fertilizers Act (R.S. 1985, c. F-10).
- .3 Fertilizers Regulations (C.R.C., c. 666).
- .4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

.4 Health Canada - Pest Management Regulatory Agency (PMRA)
- .1 National Standard for Pesticide Education, Training and Certification in Canada (1995)

.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
- .1 Material Safety Data Sheets (MSDS).

1.4 Definitions

.1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.5 Action and informational submittals

.1 Submit product data and samples as required.

1.6 Work calendar

.1 Protection work must be done prior to any excavation and earthworks.

1.7 Contractor's responsability

.1 The Contractor is liable for any damage caused to the vegetation to be conserved inside and outside the limits of construction work.

.2 Any damage that may be caused to trees and plants will be repaired as indicated and to the satisfaction of the PCA Representative at the Contractor's expense.

.3 If irreparable damage or loss of vegetation to be conserved is caused by Contractor's negligence to comply with the present conditions of this section and the indications given by PCA Representative, replacement by equivalent planting work will be carried out by the Contractor, at his expense.

.4 The Contractor shall not cut down any trees or remove plants on his own initiative inside or outside the limits of construction work.

.5 No construction work, ground disturbance, storage of construction equipment or circulation of machinery will be tolerated near existing trees and shrubs to be preserved.

1.8 Replacement of damaged plants

.1 The Contractor shall replace each damaged tree with a tree of the same species and size if its size is 150mm caliper or less. If existing tree is bigger than 150mm caliper replace with a tree of same species of 100 mm diameter and eight (8) meter height. The Contractor must guarantee survival of any replacement tree for a period of two (2) years following the provisional acceptance of the work.

.2 All existing trees and shrubs to be conserved in this project will be subject to an assessment based on the use of the International Society of Arboriculture Tree Assessment Guidelines. Any compensation for damage to these trees due to negligence will be based on the assessment criteria found in these guidelines, particularly for plants that can not be replaced, for any reason.

1.9 Waste management and disposal

.1 Sort and recycle wastes and transport to appropriate recycling facilities.

.2 Place in designated containers substances that meet the definition of toxic or hazardous waste and transport to an approved hazardous materials collection site.

.2 Remove from site all packaging materials and return to appropriate recycling facilities.

.3 Transport unused metal components to a approved metal recycling facility.

PART 2. PRODUCTS

2.1 Materials

.1 Wood pieces 38 x 89 x 4 000 mm (2 "x 4" x 16'-0 ") to protect tree trunks. The wood pieces must be held in place by metal strips.

.2 Temporary cover for open tree roots shall consist of a filter fabric such as Texel 912 non-woven protective geotextile or the equivalent approved by the PCA Representative, retained by stakes. This protective cover must be installed in less than an hour after the roots have been exposed.

.3 Temporary fence:

Protec type as manufactured by Metaltech-Omega Inc. or approved equivalent. The Contractor must propose a method of securing the fence to the ground with metal rods or other to ensure its strength, position and maintenance throughout the duration of the project.

PART 3. EXECUTION

3.1 Plant identification and protection

.1 At the very start of project and with PCA Representative presence on site, identify plants to be conserved and protected, and indicate the limit of their root system as directed.

.2 Protect all identified vegetation and root system from damage, soil compaction and contamination caused by construction as directed by PCA Representative. Do not drive any machinery or store material near plants to avoid soil compaction and other adverse effects on the roots as well as injury to the aerial parts of plants.

.3 Ensure no pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician and follow instructions of the PCA Representative.

3.2 Installation of temporary fence type 1

.1 Install temporary fence to manufacturer's specifications and on a radius of 4.0 meters (unless otherwise advised by PCA Representative) from existing trees and 2.0 meters from shrubs (unless otherwise specified by Parks Canada Representative) to be kept or as indicated in the plans and specifications.

.2 Fence must protect plants and root systems against damage caused by machinery, soil compaction and contamination caused by construction work as directed by the professional.

.3 The protective fence must be kept in place and in good condition throughout duration of work.

.4 The Contractor must provide maximum protection for all existing trees and other vegetation to be conserved within or adjacent to the construction work limits. Protection must be maintained throughout the duration of the work and without limitation:

.1 The Contractor must take all necessary measures to avoid the movement of heavy machinery, any storage of materials and all excavation, backfilling and excavation work within the protection distances specified in 3.2.1. or more, according to the indications of the Professional.

.2 Before starting work, a fence must be installed at the edge of the perimeter of protection. It must be kept in place and in good condition for the duration of the work. The fence must ensure effective and continuous delineation.

.3 Where the prescribed protective measures can not be applied due to the nature of the work, the Contractor is required to have the PCA Representative approve the protection and work methods to be used, before the beginning of the work. This applies in particular for the work that will be carried out on the private grounds of residents adjacent to the protective fence to be installed.

.5 Do not cause water accumulation or sediment deposits at the base of trees.

3.3 Installation of wood pieces around trees

.1 The trunks of trees designated by PCA Representative must be protected by pieces of wood to avoid damaging them.

.2 These trees are in strategic locations where the various works and

the passage of the machinery may damage their aerial parts.

3.4 Removal of existing hard surfaces

.1 If an existing hard surface provides protection for the tree roots, which is determined by the Professional, it must be removed and the area restored in a single continuous phase to protect the roots as much as possible.

.2 Prior to commencing work, obtain approval of the PCA Representative to schedule the removal of existing sidewalk or other existing pavement.

3.5 Clearance of interfering branches

.1 The Contractor shall clear interfering branches that are in the work zone of equipment or machinery and that may be damaged during work.

.2 Attach tree and shrub branches of trees that are in the way, with ropes. If trees and shrubs are growing, limit attachment periods to a minimum so as not to damage the foliage.

.3 When branches cannot be attached, these branches may be pruned in accordance with NQ 0605-200 after having obtained the written approval of the PCA Representative. Where trees are located outside the public right-of-way, but whose interfering branches must be pruned, their owner's written authorization must be obtained before starting pruning work or tree treatments.

.4 The Contractor must present his intervention plan to Parks Canada Representative before carrying out the work.

.5 During the work, if unforeseen damage occurs, PCA Representative must be notified to recommend the required tree treatments.

3.6 Pruning

.1 If required, prune trees and shrubs according to NQ 0605-200. This work must be done by competent labour team approved by PCA Representative.

.2 Clear cut of damaged roots on existing plants to be conserved along excavations for all broken roots with a diameter of 10 mm or more.

3.7 Removal of protection measures

.1 Protective measures must be removed only at the request of the PCA Representative, when the latter considers that the risks to vegetation are non-existent.

END OF SECTION

Precast concrete unit paving

Issued for tender 2018-11-09

PART 1. GENERAL

1.1 Scope

.1 Requirements for production of precast concrete paving units laid by hand or by mechanical means, and related methods of execution.

1.2 Scope of work

.1 The Contractor is responsible for obtaining a copy of all sections of this specification even if it seems irrelevant to his specialty, otherwise he will be acknowledged to accept the clauses and requirements of all sections of this specification. The specialized subcontractor must consult the table of contents of this specification for the complete list of specification sections.

.2 Each work must include the following responsibilities and works:
- .1 Supply of labor, materials required for installation, accessories and machinery necessary for the execution of work;
- .2 Preparation of foundation bed;
- .3 Complete installation of pavers;
- .4 Off-site transportation of waste materials.

1.3 Related requirements

.1 Civil engineering specifications - granular foundation

.2 Civil Engineering Specifications - Geotextiles

.3 Section 31 14 11 – Rough grading

.4 Section 32 15 40 - Crushed Stone surfacing

.5 Section 32 91 21 – Topsoil placement and fine grading

1.4 References

.1 American Society for Testing and Materials International, (ASTM).

.1 ASTM C 979-[99], Standard Specification for Pigments for Integrally Colored Concrete.

.2 Association canadienne de normalisation (CSA)/CSA ASTM C 136-14, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.2 Canadian Standard Association (CSA)/CSA International.

.1 CSA A23.1/A23.2-F09, Concrete Materials and Methods of Concrete Construction/Test Methods and

Standard Practices for Concrete.

.2 CSA A23.2-6A-D4, determination of density and absorption of the fine aggregate.

.3 CSA A231.1-14/A231.2-14, Precast Concrete Pavers.

.4 CSA A283-F00, Qualification code for concrete testing laboratories.

.3 Pavement Laboratory of the Ministry of Transportation of Quebec

.1 LC 21-075-2005-12-15: Determination of the flow coefficient of fine aggregates.

.2 LC 21-080-2006-12-15 : Determination of friability percentage of fine aggregates.

.3 LC 21-101-2001-12-15 : Determination of wear coefficient by attrition of the aggregate using the micro-Deval device.

1.5 Requirements

.1 Pavers must meet the requirements of CSA Standard A231.1-14 except for the durability of freeze / thaw cycles in the presence of de-icing salts, article 6.1.2.2 "De-icing salts freeze-thaw durability " where the requirement for maximum loss at 28 cycles and 49 cycles is respectively 225 g / m² and 500 g / m².

.2 Pavers must meet the requirements of CSA Standard A231.2-14.

1.6 Action and informational submittals

.1 Submit samples, data sheets and test reports in accordance with general contract requirements for each type of paver requested.

.2 Submit results of the following tests and samples :

.1 Sieve analysis for gradation of bedding and joint material (polymeric sand).

.2 During production of precast pavers for the project, take samples at the production plant and have them analyzed by an independent laboratory in accordance with the requirements of CSA Standards A231.2-14 and A231.1-14. The laboratory shall issue a certificate stating that all types of pavers comply with all requirements of the standard.

.3 If results do not comply sith standards, pavers will be refused.

.3 Samples:

.1 Submit full size sample of each type of proposed pavers.

.4 Manufacturer's instructions:

.1 Submit installation instructions provided by the manufacturer.

1.7 Quality assurance

.1 Qualifications:

.1 Installer: company or person specializing in precast concrete paver installations with 5 years documented experience and references.

.2 Proof of installer's competence must be submitted to the PCA Representative for review and approval.

.2 Production plant:

.1 The entire production of precast pavers shall be coming from a single factory for the entire duration of contract by Contractor.

.3 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

.4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.5 Mock-ups:

.1 Construct 1 m x 1 m area mock-up.

.2 Mock-up will be used:

.1 To judge quality of work, substrate preparation, operation of equipment and material application.

.2 To determine surcharge of bedding layer, joint sizes, lines, laying patterns, colours and texture.

.3 Build mock-up where indicated.

.4 Allow 24 hours for inspection of mock-up by PCA Representative before proceeding with work.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.8 Quality control

.1 Uniformity of color :

.1 Color of precast concrete pavers must be consistent from the beginning to the end of production for the Contractor's entire contract. All precast concrete pavers of production shall be identical to the precast concrete paver samples that have been approved by the Parks Canada Representative at the beginning of the contract. No color variation will be tolerated. In the event of non-compliance, the PCA Representative may reject all or part of the lot represented by the non-compliant sample.

.2 Uniformity of constituents :

.1 The concrete formula must remain the same throughout the production. No variation in color, aggregate and finish due to ingredient changes will be tolerated. In the event of non-compliance, the PCA Representative may refuse part or all of the lot represented by the non-compliant sample.

.3 The PCA Representative reserves the right to take samples of the materials, at the production plant or on site, to verify compliance with the contract documents and data submitted by the materials manufacturer. In case of nonconformity, he may refuse part or all of the lot represented by the non-conforming sample.

.4 If the materials delivered on site are found to be non-conforming, they must be removed from site and replaced without delay by compliant materials approved by the PCA Representative.

.5 If the implementation of prefabricated concrete pavers or tolerances do not conform to the requirements of this specification or the contract documents, Contractor shall immediately make the necessary corrections to correct the non-compliance. If non-compliance persists, the PCA Representative may stop the work and impose corrective measures at his discretion.

1.9 Measuring for payment

.1 Precast concrete pavements, including labor, granular foundations, laying beds, polymer sand and retaining edges shall be measured per square meter.

1.10 Waste management and disposal

.1 Dispose of off-site, at appropriate location, pavers rejected for installation.

.2 Fold metal strapping, flatten and place in designated area for recycling

PART 2. PRODUCTS

Precast concrete unit paving

Issued for tender 2018-11-09

2.1 Concrete pavers

.1 Precast Concrete Pavers: Pavers must meet the requirements of CSA A231.1-14 / A231.2-14, BNQ-0605-500 for concrete pavers and the following requirements:

.1 **Type 1** :

Model: Méga Paleo

Color : Red

Dimensions : Variable X 125mm X 100mm thick

Company : Permacon or approved equivalent

.2 **Type 2** :

Model: Mega Paleo

Color : Stanstead Grey

Dimensions : Variable X 125mm X 100mm thick

Company : Permacon or approved equivalent

.3 **Type 3 :**

Model: Boulevard TLI 100

Color : Light grey, standard finish

Dimensions : 700mm X 300mm X 100mm thick

Company : Permacon or approved equivalent

.2 Pavers manufactured in moulds, with spacers, suitable for installation and delivered on site in cubes of laying panels, in protective wrapping.

.3 Pigment in concrete pavers: to ASTM C 979/C 979M.

2.2 Bedding and joint material

.1 Installation bed: stone dust, complying with the requirements in tables a and b, and free from clumps of clay, organic materials and other deleterious substances.

Table a – particle sizes

Sieve (mm)	Passing %		
	Bedding material	Joint filling	
		3 mm	> 3 mm
10	100		100
5	95-100	100	90-98
2,5	80-100	85-100	55-90
1,25	50-85	50-85	40-75
0,630	25-60	25-60	25-55
0,315	10-30	15-35	15-30
0,160	5-15	10-25	10-20
0,080	0-5	8-15	8-15

Table b – complimentary characteristics

Characteristics	Specifications	Test method
Micro-Deval	Max. 35%	LC 21-101
Flow coefficient	Min. 80%	LC 21-075
Absorption	Max. 1,0%	LC 21-065
Reliability	Max. 40%	LC 21-080

2.3 Edge restraints

.1 Aluminum edge restraints for pavers, 76mm X 76mm with accessories. Supplied in 2,44m (8'-0 ") or 4,88m (16'-0 ") length sections with connectors for securing sections together.

.1 Anchoring : Spiral anchor spikes made of galvanized steel, designed for edges, 254mm long – one per 305mm of edge.

.2 Finish: natural grey

.3 Model : *Asphalt Edge* from Permaloc or approved equivalent.

2.4 Cleaning product

.1 Clear, organic solvent, designed and recommended by manufacturer

for cleaning concrete pavers of contamination encountered.

.2 Acid based chemical detergent, designed and recommended by manufacturer for removal of contamination encountered on pavers.

2.5 Polymeric sand joints

.1 Joint filling: pre-bagged sand to which a dry polymeric binder added at bagging, Techniseal HP type or approved equivalent.

.2 Color : grey

PART 3. EXECUTION

3.1 Manufacturer's instructions

.1 Compliance: Comply with manufacturer's written requirements, recommendations, and specifications, including any available technical bulletins, product catalog instructions, product packaging instructions, and data sheet specifications.

3.2 Structural surface

.1 Verify that structural surfaces conform to levels and compaction required for installation of unit pavers. If discrepancies occur, notify PCA Representative and do not commence work until instructed by PCA Representative.

.2 Verify that top of structural surface (top of base) does not exceed plus or minus 10 mm of grade over 3 m straightedge.

.3 Ensure that structural surface is not frozen or standing water is present during installation.

3.3 Installation of edge restraints

.1 Verify that edge restraints meet requirements for level and alignment required for paving. In the event of non-compliance, notify the PCA Representative and do not commence work until further instructions have been received from the PCA Representative.

.2 Install edge restraints true to grade, and where indicated on plans, in accordance with manufacturer's recommendations.

.3 Make perfectly straight or perfectly curved lines as specified in the layout plan.

.4 Fasten curbs with pegs supplied with curbs by distributor. Place a peg every 300 mm center to center.

3.4 Placing of bedding material

.1 Ensure bedding material is not saturated or frozen at all times until installation is complete.

.2 Spread and screed material on structural surface to achieve 25 mm compacted thickness after vibrating pavers in place. Do not use joint sand for bedding sand. The granular foundation must meet the requirements and its irregularities cannot be corrected by the swelling of the laying bed.

.3 Do not disturb screeded material. Do not use bedding material to fill depressions in structural surface.

.4 Any area hardened in any way, even by rain, must be scarified, loosened, and restored to its original condition. Any traffic on the laying bed after grading is prohibited.

3.5 Pavers cutting

.1 If necessary, cut pavers with a concrete saw, without damaging the edges, so that they can be aligned and arranged precisely to adjacent elements. Cold chisel cuts are not accepted.

.2 All pavers to be cut with rounded shapes must be cut with tools designed for this purpose to obtain well finished circles and curves.

.3 All on-site cuts shall be made using a water table saw.

.4 No cut shall be less than 25 mm from the edge of an element unless otherwise specified.

.5 A cut paver must have at least one uncut main side.

.6 A cut paver with a face area less than half that of the complete element may only be used if authorized by the PCA Representative.

3.6 Installations of concrete pavers

.1 Lay pavers to patterns and models indicated. Joints between pavers: as recommended by manufacturer.

.2 Use appropriate end, edge and corner stones. Water-saw cut pavers to fit around obstructions and at abutting structures.

.3 Installation by mechanical equipment:

.1 Prepare installation sequence and obtain approval of sequence by PCA Representative.

.2 Place paver pallets and other materials without exceeding load bearing capacity, or otherwise detrimentally affecting installations.

.3 Run equipment approved for installation only on paving surfaces vibrated in place.

.4 Complete installation after placing each 100 square metres.

.5 Inspect pavers and remove chipped, broken or otherwise damaged pavers as directed by PCA Representative and if structural performance or aesthetics is adversely compromised.

.6 Replace pavers removed without altering layout and structural quality.

.4 Use a low amplitude, high frequency plate compactor capable of at least 22 kN centrifugal compaction force to vibrate pavers into bedding sand.

.5 Inspect, remove, and replace chipped, broken and damaged pavers.

.6 Sweep polymeric joint sand material into joints with broom, according to manufacturer's instructions. Surface must be dry when doing this step.

.7 Settle sand by vibrating pavers with plate compactor.

.8 Continue application of joint material and vibrating of pavers until joints are full. Do not vibrate within 1 m of unrestrained edges of pavers.

.9 Complete installation to within 1 m of laying face, with sand-filled joints, before any work stop.

.10 Sweep off excess joint material when installation is complete.

.11 The vibrating plate must be able to firm the elements to the specified grade level without damaging them. The plate must never be in direct contact with the surface of natural stone elements; a plywood board 20 mm thick should always be used as a cushion between the vibrating plate and the surface of these elements. Pass the vibrating plate at least three times in different directions.

.12 Proof roll heavy traffic surfaces to test compaction, making at least two passes with a 10 ton rubber-tired roller.

.13 Final surface elevation of the paved surface is considered to conform when it shows no difference greater than 10 mm, plus or minus, measured with a 3 m long straightedge.

.14 Planimetry: flatness of the pavers surface is verified at the straightedge of 3 m placed diagonally at 45 ° (relative to the orientation of the joints). The verification is carried out at the frequency of a survey per 10 m of surface, with a minimum of 5 surveys per total surface done. No defect measured in the vertical direction shall exceed 5 mm.

.15 Surface elevation of pavers: 3 to 4 mm above adjacent drainage inlets, concrete collars or channels.

.16 Ensure conformance of final elevations.

3.7 Cleaning

.1 Perform cleaning in the conditions and at the time recommended by the cleaning products manufacturer and in accordance with instructions from the PCA Representative.

.2 Clean the paved surface of any non-adhering foreign matter.

.3 Apply appropriate cleaning products to clean pavers from any stains as recommended by manufacturer.

.4 Leave finished surface free from dirt.

.5 Upon completion of installation work, dispose of surplus materials, waste materials, tools and safety barriers.

END OF SECTION

Crushed stone surfacing

Issued for tender 2018-11-09

PART 1. GENERAL

1.1 Scope

.1 This section describes supply and installation of crushed stone surfacing, including granular foundation. Geotextile membrane when required.

1.2 Related requirements

.1 Section 31 32 21 : Geotextiles

.2 Section 32 14 13 : Precast concrete unit paving

.3 Section 32 92 23 : Sodding

1.3 Measurement and payment

.1 Crushed stone surfaces will be measured per square meter in place.

.2 Crushed stone surfacing include fine grading of granular foundation and compaction.

.3 Crushed stone reserves to be delivered to the owner include supply and delivery.

1.4 References

.1 Bureau de normalisation du Quebec (BNQ)

.1 ACAN/BNQ 2501-255 Soils – Determination of relation between water content and density –Test with modified compaction energy (2700kN.m/m3)

.2 NQ 2501-258 Soils – Determination of relation between water content and density – Vibrating hammer test

.3 NQ 2560–114 « Civil engineering work – Aggregates »

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.2 CAN/CGSB-8.2-88, Sieves, Testing, Woven Wire, Metric.

.3 American Society for Testing and Materials (ASTM)

.1 ASTM C 136-06, Method for Sieve Analysis of Fine and Coarse Aggregates

.2 ASTM C117-13, Test Method for Material Finer tan 0,075 mm (no 200) Sieve in Mineral Aggregates by Washing

.3 ASTM E 11, Specification for Wire – Cloth Sieves for Testing Purposes

.4 ASTM D 4318, Standard Test Methods for Liquid Limit, Plastic Limit and Plasticity Index of Soils.

1.5 Protection measures

.1 Take necessary measures to avoid damage to existing landscaping elements, curbs, sidewalks, trees, fences, causeways and adjacent properties. If necessary, repair any damage.

.2 Coordinate the implementation of landscape work in such a way as to disturb the site users as little as possible.

1.6 Waste management and disposal

Transport unused materials to an appropriate recycling facility.

PART 2. PRODUCTS

2.1 Materials

.1 If existing granular base does not meet specified requirements, see section 32 11 23 Aggregate base courses

.2 Granite crushed stone :

- .1 Color : northern grey (gris du nord)
- .2 Size : 0-5mm
- .3 Company : 20-331 Agrebec or approved equivalent.

.3 The material used must be granite, limestone or basalt based. Fines should be homogenous in the material. When material comes from gravel, 50% of material should have a crushed face.

.4 Geotextile : type Texel 7609 or approved equivalent.

.5 No products containing calcium shall be included in the composition of the stabilizing product and in the crushed stone mixture.

PART 3. EXECUTION

3.1 Subgrade

.1 Ensure subgrade preparation conforms to levels and compaction required, to allow for installation of granular base.

.2 Place material in uniform layers not to exceed 150 mm compacted thickness. Compact layer to 95 % Standard Density in accordance with ASTM D 698.

3.2 Geotextile filter

.1 Install geotextile filter type: Texel 7609 or approved equivalent according to manufacturer's instructions and indications. See section 31 32 21.

3.3 Installation

.1 Install crushed stone on the prepared foundation, to thicknesses after compaction as indicated on plans details. To avoid segregation, application

must be made in one layer.

.2 Boundaries of surfaces will be properly defined and aligned. Joints with adjacent finishes should be regular and stable, without ripples. Surfaces must conform to all levels and slopes indicated on the plans.

.3 Any crushed stone surface considered unsuccessful (thickness, levels, alignments, etc.) by the PCA Representative shall be redone to the satisfaction of the Representative.

3.5 Compaction

.1 When water is drained and surface remains wet (about 6 to 24 hours), roll with a minimum 1 ton roller. Do not use vibratory plates or vibrating rollers.

3.6 Inspection

.1 The finished surface should be flexible, uniform and solid, with no cracks, signs of erosion, or apparent stratifications. When dry, the compacted material must be firm without presenting spongy areas. Loose material should not be present on the final surface before use.

.2 Loose materials or lack of cohesion of materials on the surface are a sign of poor mixing or lack of water. Test the area by adding water, letting it in and compacting. If the imperfection persists, the mixture is not adequate. If the surface has cracks or spongy areas, too much stabilizer has been used.

.3 Non performing surfaces shall be replaced by a new 0/5 mixture stabilized to specifications and installed as recommended by the manufacturer.

.4 Final thickness of the crushed stone topping layer shall in no case be less than 45 mm at any given point, which demands a good final grading of foundation layer.

END OF SECTION

PART 1 – GENERAL

1,1 Scope of work

.1 The Contractor must realize the pavement marking of bike path as indicated on the plans.

1.2 Related requirements

.1 Civil Engineering Specifications - Asphalt Pavement

.2 Section 01 33 00 – Submittal procedures

1.3 Measurement for payment

.1 Thermoplastic surfaces are measured on site per square meter. There will be no deduction of space allocated to areas occupied by manholes, sewers, structures, drainage and other structures.

1.4 References

.1 Specification and general specifications of the Ministry of transport of Quebec (C.C.D.G).

.2 Road construction standards M.T.Q., Road signs, Tome V, volume 2 and Tome VII «materials».

.3 ASTM D570 Standard test method for the permeability of plastics.

.4 ASTM D36 ASTM D36-06 Standard Test Method for Bitumen Softening Point (Ball and Ring Apparatus).

.5 AASHTO T250 Content of the binding component (binder).

.6 ASTM D792 Standard test method for specific density and gravity (relative density) and density of solid plastics.

.7 AASHTO T250 Resistance to low temperature constraints.

.8 ASTM D 2240 Standard Test Method for Rubber Properties - Durometer Hardness Measurement.

.9 ASTM D256, Method A Standard Test Method for Determining Izod Resiliency Testing of Plastics.

.10 ASTM D92 Test method for flash points.

1.5 Requirements

.1 The material shall consist of ester-modified resin, that fuels or lubricants, etc. can not degrade, as well as aggregates, pigments, binders and glass beads factory-manufactured as finished products, and that meets the requirements of the current edition of the *Manual of Uniform Traffic Control Devices* for streets and roads. The thermoplastic material shall conform to the M249 designation of

AASHTO, except for the relevant differences in that it is a preformed material.

.2 Pigments :

.1 White: The material shall contain sufficient titanium dioxide pigments to comply with Tables 5 and 6 reviewed and corrected for FHWA (Docket No. FHWA-99-6190).

.2 Red, blue and yellow: The material shall contain sufficient pigments to comply with Tables 5 and 6 reviewed and corrected for FHWA (Docket No. FHWA-99-6190). Yellow pigments must be organic and free of heavy metals.

.1 Glass beads :

.1 The material shall contain not less than thirty percent (30%) by weight of calibrated glass beads intermingled. The interlocking beads must conform to AASHTO designation M247, at least 80% of which must be perfectly spherical and have a minimum refractive index of 1.50.

.2 The material shall include, in addition to intermingled glass beads, coated surface beads sprinkled in factory with 1 lb (± 10%) per 10 square feet. At least 90% of the coated surface beads should be perfectly spherical, and their minimum refractive rate should be 1.50. These balls must also conform to the following calibration:

Grain size grading		% retained	% passing
US Mesh	µm		
12	1700	0 - 2 %	98 - 100 %
14	1400	0 - 3,5 %	96,5 — 100 %
16	1180	2 - 25 %	75 - 98 %
18	1000	28 - 63 %	37 - 72 %
20	850	63 - 72 %	28 - 37 %
30	600	67 - 77 %	23 - 33 %
50	300	89 - 95 %	5 - 11 %
80	200	97 - 100 %	0 - 3 %

PART 2 - PRODUCTS

2.1 Materials

Markings:

.1 Thermo-Design PreMark® thermoplastic preformed road marking or approved equivalent with glass beads. Color: yellow PMS 7408C

.2 Thermo-Design PreMark® thermoplastic preformed road marking or approved equivalent with glass beads. White colour

.3 Thermo-Design DecoMark® Custom Thermoplastic Preformed Road Marking or approved equivalent with glass beads. Color: white.

.4 Thermo-Design Duratherm® Preformed and embedded Thermoplastic Preformed Road Marking or approved equivalent conforming to the specified model. Color: white.

2.2 Equipment

For PreMark® and DecoMark® products or equivalent, use the wing tools, but not limited to:

.1 Flint 20000EX® propane torch or equivalent, with pressure regulator.

.2 Gas blower or broom, chalk line, retractable blade knife, putty knife, hammer, punch, propane gas and paint roller.

.3 Plastic templates.

.4 Infrared radiator.

PART 3 – EXECUTION

3.1 Marking

Marking type	Color
- Central line	Yellow PMS 7408C with glass beads
- Small direction arrows	White with glass beads
- Large direction arrows	White with glass beads
- Diagonal full lines	White with glass beads
- Diagonal embedded lines	White with glass beads
- Text «J'aime, je partage / I like, I share»	White with glass beads

3.2 Examination

.1 Pavement surface: dry, free from water, frost, ice, dust, oil, grease and other deleterious materials.

.2 Surfaces must be free of moisture. Dry the application area with a propane torch if necessary.

3.3 Application

.1 Painting: Determine the pattern of markings to be carried out and obtain the approval of the PCA Representative before commencing work.

.2 Unless otherwise specified by the PCA Representative, apply thermoplastics only when the wind speed is below 60 km / h, the air temperature is above 10ºC and no rain is expected in the next 4 hours.

.3 Do not thin paint or modify product without the permission of the PCA Representative.

.4 Letters and symbols marked must conform to the dimensions indicated.

.5 Painted lines must be uniform in tone and density and their boundaries must be clear and neat.

.6 Width of the painted axial lines shall be 100 mm.

.7 PreMark® and DecoMark® :

.1 Place all parts (lines, legends or symbols) on the surface of the pavement, with the beads exposed upwards. There must be no space between adjacent pieces. Slightly overlap edges. Be sure to properly position and align parts before heating the material.

.2 Before heating the material, make sure to have wind coming from the back (if wind) and to be facing the markings. Verify that the indentations close during the application, showing that the material has reached the melted state and that the beads are well integrated. Heat the material until it melts to adhere to the pavement. The material will not adhere well if it is not sufficiently heated.

.3 Heat material by moving torch flame in a sweeping motion approximately 61 cm wide. Heat slowly, but without stopping, keeping the torch tip at a minimum distance of 10 to 20 cm from the material. Keep a minimum distance of 10 cm between the torch tip and the material.

.4 Before Contractor leaves site, the PCA Representative will inspect the work for adhesion of the product. Make a mark with a punch where the product seems to have been the least heated. On white material, the mark will be whiter. If it is possible to lift the product without any trace of asphalt underneath, continue heating until the product adheres.

.8 Duratherm® :

.1 The pattern layout of imprints to be embedded in the asphalt surface will follow the manufacturers recommendations and specifications and will be in accordance with the methods prescribed by Duratherm® application, in collaboration with the PCA Representative.

.2 Before heating the material, make sure that the surface temperature does not exceed 163 degrees Celsius. For the material to become embedded, raise the surface temperature on at least 12.5 mm thick without burning the surface.

.3 Place the template and press with a vibrating plate.

.4 Place pre-cut thermoplastic sheets in imprints and overlap joints. Heat the material until it melts to adhere to the pavement. The material will not adhere well if it is not sufficiently heated.

.5 Before Contractor leaves site, the PCA Representative will inspect the work for adhesion of the product. In the case of white material, the mark will be whiter. If it is possible to lift the product without any trace of asphalt underneath, continue heating until the product adheres.

3.4 Tolerance

.1 Paint markings: within plus or minus 10 mm of dimensions indicated.

.2 Remove incorrect markings as indicated by PCA Representative.

.3 Skid resistance: The surface of material, with the surface beads properly sprinkled and integrated, shall have a minimum strength value of 45 BPN when tested in accordance with ASTM E 303.

.4 Resistance to environmental conditions: The material must be able to withstand the effects of sun, water, salt or weather and be impervious to oil and gasoline.

3.5 Protection of markings

.1 Protect pavement markings until thermoplastic is cold.

3.6 Cleaning

.1 Perform cleaning in conditions and at time recommended by the cleaning product's manufacturer and in accordance with the instructions of the PCA Representative.

.2 Clear the paved surface of any non-adhering foreign matter.

.3 Apply appropriate cleaning products to clean pavers from any dirt, stain, etc as recommended by manufacturer.

.4 Leave finished surface free from any dirt, stain, etc.

.5 Upon completion of installation work, remove surplus materials, waste materials, tools and safety barriers from work site.

END OF SECTION

Exterior site furnishings

Issued for tender 2018-11-09

PART 1. GENERAL

1.1 Scope

.1 Material and materials constituting standard manufacturing catalog items, such as litter bins, recycling bins, backless benches, signposts, traffic signs, fixed bollards, removable bollards, plus installation of these items.

.2 Work described in this section includes, but is not limited to:
- .1 excavation ;
- .2 foundation ;
- .3 supply and installation of equipment ;
- .4 levelling and finishing to adjacent surfaces.

1.2 Related requirements

.1 The Contractor is responsible for obtaining a copy of all sections of this specification even if it seems irrelevant to his specialty, otherwise he will be acknowledged to accept the clauses and requirements of all sections of this specification. The specialized subcontractor must consult the table of contents of the specifications for the complete list of sections.

.2 Civil engineering specifications - concrete foundation

.3 Section 01 33 00 – Submittal procedures

.4 Section 32 14 13 – Precast concrete unit paving

.5 Section 32 91 21 – Topsoil placement and fine grading

1.3 References

.1 American Society for Testing and Materials International, (ASTM).
- .1 ASTM- A123 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM – A-48-76 Class 30 Grey Cast Iron

.2 Ministry of Transport, sustainable mobility and transport electrification
- .1 HOM 6310-101 « Supports yielding under impact - Small signaling ».

1.4 Action and informational submittals

.1 The Contractor must provide the technical sheets for approval of all site furnishing items before start of work. These should include specifications for all different materials, finishes and colors. in accordance with Section 01 33 00 - Submittal Procedures.

.2 Shop drawings must include the following specifications, not limited

to:

.1 dimensions
.2 material
.3 finishes
.4 colors
.5 sizes
.6 method of assembly, anchorage and installation of each specified site furnishing element.

1.5 Maintenance and warranty manual

.1 The Contractor shall submit the necessary instructions for the maintenance and cleaning of site furnishings.

1.6 Quality assurance

.1 Sustainable Standards Certification:

Certified Wood: submit listing of wood products and materials used in accordance with CAN/CSA-Z809 or FSC or SFI.

.2 The Contractor must also provide a warranty certificate specifying its duration, extent and limits, as well as contact details of manufacturer and / or supplier responsible for this warranty.

1.7 Measurement for payment

.1 Site furnishing is calculated per unit installed on site. Measurement also consists of verifying compliance with requirements of this tender document.

.2 Payment for supply and installation is made per unit cost or overall cost of the appropriate article in the price schedule of bid form.

.3 Overall unit cost includes supply, equipment including all necessary anchors and fittings, as well as foundations, materials and labor required for fabrication and installation in accordance with the requirements of the plans, details and present specifications.

.4 Unless otherwise indicated in the price schedule, cost must include the repair of adjacent surfaces (grass, stone dust, asphalt, concrete, pavers, etc.) damaged by the work.

.5

1.8 Delivery, storage and handling

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and acceptance requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and handling requirements:

1. Store materials in dry location and in accordance with

manufacturer's recommendations in clean, dry, well-ventilated area.

2. Store and protect furnishings from nicks, scratches, and blemishes.

3. Store existing site furniture at this address: 1156 Mill street, Montreal, QC, H3K 2B3.

4. Replace defective or damaged materials with new.

1.9 Management and waste disposal

.1 Separate waste for reuse and recycling.

.2 Remove from site all packaging materials and return to appropriate recycling facilities.

.3 Fold metal strapping, flatten and place in designated areas for recycling.

.4 Place all paper, plastic, polystyrene and corrugated packaging materials in appropriate on-site bins for recycling in accordance with the waste management plan.

.5 Separate waste steel, metal, plastic for reuse and recycling, and place in designated containers in accordance with Waste Management Plan.

PART 2. PRODUCTS

2.1 Backless bench

.1 Product: Model EP 1602-IPE-P-ASS-QAV backless from Equiparc or approved equivalent.

.1 Dimensions : 435mm (height), 572mm (depth), 1803mm (length).
.2 Leg base: aluminum casting in alloy 356.2 sand molded - incorporating Parks Canada logo
.3 Supporting strip: 6mm aluminum plate profiled according to the curve of leg base.
.4 Finish: Painted powder coating process by electrostatic application - thickness of 0.102mm. Polyester powder resin for outdoor use UV resistant. Color : black semi-gloss. Paint system must meet ASTM D-227, ASTM B117 and ASTM D-1654 performance standards.
.5 Lattes: Exotic wood of IPE grade Select. 51mm x 76mm nominal, finished 38mm x 64mm with chamfer 10mm.
.6 Fasteners: Hot-dip galvanized 10mm body bolts. Wood screws # 14 zinc plated.
.7 Anchorage: Attached to concrete slab, sealing sleeve and

stainless steel bolts.

.2 Installation
- .1 Cast in place concrete slab in lowered position (installed under concrete pavers). See construction details.
- .2 Dimensions : see layout plan and details.

2.2 Recycling bin

.1 Product : Model EP 3700 from Equiparc or approved equivalent.
- .1 Frame: welded steel plates and plates (base), cast aluminum (top, bottom, rings)
- .2 Finish : zinc primer and polyester powder finishes. **Color black.**
- .3 Container: galvanized steel.
- .4 Cover: Aluminum painted with **black** polyester powder, permanent opening including two (2) signboards for recycling.
- .5 Fasteners: Stainless steel.

.2 Finishes
- .1 Zinc primer and polyester powder finishes in **black.**

.3 Installation
- .1 Cast in place concrete slab in lowered position. See construction details
- .2 Anti-theft stainless steel fasteners.

.4 Shop drawings:
- .1 Submit shop drawings for approval.

2.3 Litter bin

.1 Product : Model EP 3700 from Equiparc or approved equivalent.
- .1 Frame: welded steel plates and plates (base), cast aluminum (top, bottom, rings)
- .2 Finish : zinc primer and polyester powder finishes. **Color black.**
- .3 Container: galvanized steel.
- .4 Dome cover: Aluminum painted with **black** polyester powder.
- .5 Fasteners: Stainless steel.

.2 Finishes
- .1 Zinc primer and polyester powder finishes in **black.**

.3 Installation
- .1 Cast in place concrete slab in lowered position. See construction details
- .2 Anti-theft stainless steel fasteners.

.4 Shop drawings:
.1 Submit shop drawings for approval.

2.4 Bike rack

.1 Product: : Model EP 5911-7 as distributed by Equiparc or approved equivalent.
.1 Frame: welded steel plates and plates (base), cast aluminum (top, bottom, rings)
.2 Finish : zinc primer and **black** polyester powder finishes.
.3 Fasteners: Stainless steel.

.2 Finishes :
.1 Zinc primer and **black** polyester powder finishes.

.3 Installation
.1 Cast in place concrete slab. See construction details.
.2 Anti-theft stainless steel fasteners.

.4 Shop drawings:
.1 Submit shop drawings for approval.

2.5 Fixed bollard

.1 Product : Existing equipment re-installed.

.2 Finish :
.1 Painting made in factory, Interkoteno 30/021 industrial enamel finish, specification 1GP61, color black.

.3 Installation
.1 Cast in place concrete slab. See construction details.

2.6 Removable bollard - Type 1 (Léa Roback street)

.1 Product : Bollard provided by Parks Canada Agency.
.1 Frame: Grey cast iron
.2 Fasteners: provided by Parks Canada Agency.

.2 Finish :
.1 Painting made in factory, Interkoteno 30/021 industrial enamel finish, specification 1GP61, color black.

.3 Installation
.1 Cast in place concrete slab. See construction details.
.2 Anti-theft stainless steel fasteners.

2.7 Protection bollard – Type 2 (footbridge)

.1 Product : Bollard distributed by Circulo-O-Tube or approved equivalent. See annex for technical specifications.

.2 Installation according to manufacturer's recommendations.

2.8 Guardrails

.1 Product : Railing (2 pieces) to be provided by Contractor. Posts to be provided by Parks Canada Agency.
- .1 Railing: steel tube – 51 mm diameter

.2 Finishes :
- .1 Zinc primer and polyester powder – color black.

.3 Installation :
- .1 Cast in place concrete slab. See construction details.

2.9 Posts and signage

.1 Product : Post with profile in U – type 1
- .1 Galvanized steel
- .2 Fasteners: Aluminium

.2 Finishes :
- .1 Natural

.3 Installation : See construction details.

.4 Road sign "A", *Intersection* D-170-13 from the Ministry of Transport, sustainable mobility and transport electrification.

.5 Road sign "B", *One way* P-080-1 from the Ministry of Transport, sustainable mobility and transport electrification.

.6 Road sign "C", *Obligation to get off the bicycle*, from the Ministry of Transport, sustainable mobility and transport electrification.

.7 Cast in place concrete slab. See construction details.Concrete for foundation of items, equipment and furniture must conform to the specifications on plans.

2.10 Concrete

.1 Concrete for foundation of items, equipment and site furniture must conform to the specifications on plans.

2.11 Granular foundation

.1 Under concrete slabs for furniture, install foundation according to plans.

PART 3. EXECUTION

3.1 Installation of furnishings

.1 The Contractor must assemble site furnishings in accordance with manufacturer's written recommendations.

.2 Install furnishing true, plumb, well anchored and firmly supported, as specified by manufacturer and as indicated by PCA Representative.

.3 Touch-up damaged finishes to approval of PCA Representative. PCA Representative reserves the right to demand the replacement of any item that he deems too damaged to his satisfaction.

.4 Metal hardware used to secure furniture to concrete bases must be stainless steel.

.5 Accessible bolts must have tamper-resistant bolt covers.

.6 Any damaged or deformed part shall be rectified by processes that do not adversely affect the quality of the finished material and in a manner acceptable to the PCA Representative, or replaced, if needed.

.7 Unless otherwise specified, the Contractor shall repair adjacent surfaces (grass, stone dust, asphalt, concrete, pavers, etc.) to the satisfaction of the PCA Representative.

END OF SECTION

Topsoil placement and fine grading

Issued for tender 2018-11-09

PART 1 – GENERAL

1.1 Related requirements

1. Section 32 93 10 – Trees, shrubs and ground cover planting
2. Section 32 92 23 – Sodding

1.2 Scope of work

1. The Contractor must perform, in accordance with the documents, the works required by this section and indicated in the plans, such as: the supply, required amendments and installation of soil mixes manufactured and sieved, and appropriate for each of the following elements : sod, tree holes, shrub and perennial plant beds.
2. Each of these works must include the following responsibilities and work:
   1) Supply of labor, materials, amendments, accessories and machinery necessary for the execution of the work;
   2) Scarification of existing soil;
   3) Preparation of the foundation bed for sod;
   4) Digging of plantation beds for shrubs, perennials and tree pits.
   5) Off-site transportation of waste materials and topsoil of poor quality or contaminated by other materials that can not be used in later phases of the project, following its stripping on site.

1.3 Definitions

1. COMPOST: Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner. Compost is processed organic matter containing 65% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test. Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C / N less than 25, for planted or grassed areas and beds and C: N ratio of 30 to 35 for native tree and plant plantations), and contain no toxic or growth inhibiting contaminates. Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.

1.4 Quality assurance and samples

1. Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties.
2. Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
3. Proof of delivery : provide the delivery notes to the site supervisor.

1.5 References

1. NQ 0605-100/2001 – Landscaping using plants
2. BMP T5.13/2007 – Post Construction Soil Quality and Depth.

1.6 Waste management and disposal

1. Divert unused soil amendments to official hazardous material collections site approved.
2. Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

PART 2- PRODUCTS

2.1 Materials

1. Natural fertilizer:

.1 100% natural commercial fertilizer: fertilizer composed of ingredients from plant, animal or mineral sources exclusively;

.2 Composition to be determined according to the analysis, generally carried out for sodding (natural fertilizer in which NPK element: 0,5kg of nitrogen (N), 0,18kg of phosphorus (P) and 0,5kg of potassium (K) ;

.3 Bone powder: fine ground and containing at least 20% phosphoric acid and 3% nitrogen.

.4

2. Limestone:

1) Ground agricultural limestone, containing at least 85% of carbonates;

2) Gradation requirements: percentage passing by weight, 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.

3. Organic matter (compost):

1) Organic matter: compost from unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements. The material will be homogeneous, will have the appearance of a potting soil and will not emit any foul odor.

4. Suppliers:

1) Following suppliers are recommended :

- Sols Champlain, Mascouche.
- Savaria, Boucherville or Laval.

2.2 Planting soil mix

1. Mix nº 1 (for sodding and tree holes) :

1) Soil mix made of compost, sand and silt or clay;

2) From 80 to 90% of particles with a diameter ranging between 0.05 mm and 2 mm, distributed according to a spread-out particle size curve;

3) From 10 to 20% of fine particles smaller than 0.05mm in diameter (limit of silt), of which less than 8% less than 0.002mm in diameter (clay).

.5 Characteristics of soil mix no. 1:

a) Organic matter between 5% and 7% from natural decomposition or composting process;

b) Ph between 6 and 7 ;

c) Cation exchange capacity (C.E.C.) between 10 and 20 MEQ/100g.

d) Meq / 100g and salinity must be less than 2.5mmhoms / cm (s.s.e method);

e) Water retention capacity : Maximum 20 %

f) Phosphorus - 200 kg / ha maximum or 90 ppm maximum;

g) Potassium - 400 kg / ha or 179 ppm;

h) Calcium - 4500 kg / ha or 2009 ppm ;

i) Magnesium - 640 kg / ha or 286 ppm.

2. Mix no. 2 / shrubs and perennials planting beds:

1) Soil mix made of compost, sand, silt or clay;

2) from 80% to 90% of particles with a diameter ranging from 0,002mm to 2mm, of which 10% are less than 0.05 (silt);

3) from 0 to 8% of particles whose diameter is less than 0.002 (clay);

4) From 0 to 5% of particles whose diameter varies between 2mm and 3,4mm (gravel);

.6 Characteristics of soil mix no. 2

a) Soil mix must contain a minimum of 10% organic matter (walkley black method) from natural decomposition or composting process (humus-type compost);

b) Ph between 5.8 and 6.8;

c) Cation exchange capacity (ie, c) between 10 and 20 meq / 100g;

d) Salinity should be less than 3.5 mm hos / cm (method s.s.e);

e) Water retention capacity : Maximum 20 %

f) Phosphorus - 200 kg / ha maximum or 90 ppm ;

g) Potassium - 400 kg / ha or 179 ppm ;

h) Calcium - 4500 kg / ha or 2009 ppm ;

i) Magnesium - 640 kg / ha or 286 ppm ;

j) Chemical elements: the different chemical components of the soil

mixes must be in proportions favoring the normal growth of the plants.

2.3 Source quality control

1. The PCA Representative must have approved the proposed sources of supply for soil mixes prior to laboratory analysis.
2. Contractor is responsible for amendments to supply topsoil as specified.
3. On site soil testing should be performed by a recognized testing facility and include pH, phosphorus, potassium and organic matter content. The analysis should also indicate the average grain sizes of the soil. The laboratory will have to recommend the amendments to make so the soil comply with specifications.
4. Soil mixes testing shall be carried out by the test laboratories designated by the site supervisor. Any other laboratory must be submitted for approval to the PCA Representative. Sampling, testing and soil testing must be done in accordance with applicable provincial standards. Contractor will bear the cost of the tests performed.

Designated laboratories are :

Chemical properties :

- Agridirect Inc.

  Longueuil, QC, J4G 1P1, tel : (450) 674-5046
- LaboratoireA&L Canada Laboratories Inc.
  London, ON, tel: (519) 457-2575

Physical properties :

- Laboratoire LVM – Labo Ville-Marie, in Laval

5. Tests results must be submitted for approval according to the following deadlines:
6. a) On site soil : 15 working days before the start of the work;
7. b) Soil mixes: 10 working days before the start of the work.

.7

PART 3 – EXECUTION

3.1 Preparation of existing grade

1. Verify that grades are correct. If discrepancies occur, notify the PCA Representative and do not commence work until instructed by Parks Canada Representative.
2. Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
3. Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75 mm above surface. Dispose of removed material off site, where indicated by Parks Canada Representative.

3.2 Placing and spreading of topsoil/planting soil

1. **For areas to be sown and tree pits:**

a) A total of **150 mm (6 ")** of mix soil mix no. 1 is required for all areas to be sodded.

b) Water the soil, allow the water to seep in and roll with a light lawn roller to obtain a uniform and firm surface;

c) Bring the level of the soil layer to 20mm below the final soil level to allow sodding.

d) Description of the tree holes: walls must be inclined, the lower width must correspond approximately to the diameter of the root ball and the upper opening must correspond to 1,75m x 1,75m.

e) For trees, the depth of the holes should be limited to the actual height of the root ball (depending on the level of the collar) and the root ball should rest on undisturbed soil or well compacted (see details of planting).

3. **For shrubs and perennials beds**:

a) Total thickness (after settlement) of soil mix no 2 is:

- Shrubs : 450 mm
- Perennials and ornemental grasses: 300 mm

b) Dig the planting holes/beds according to the type of plants.

c) Spread soil mix no. 2 to respect the depths for each type of planting as specified in point a) and planting details.

d) Water and roll slightly to obtain a firm surface.

3.3 Final grading

1. Grade to eliminate rough spots and low areas and ensure positive drainage. Prepare loose friable bed by means of cultivation and subsequent raking.

2. Consolidate topsoil to required bulk density using equipment approved by PCA Representative. Leave surfaces smooth, uniform and firm against deep footprinting.

3.4 Acceptance

1. The PCA Representative will inspect the soil mixes in place and determine if the material, depth and final grading are acceptable.

3.5 Cleaning

1. Remove excess material except topsoil, from site at the location indicated by the PCA Representative.

2. Upon completion of installation, remove from site surplus materials, rubbish, tools and equipment barriers.

3.6 Measurement for payment

1. Measurement of topsoil/planting soil placement and grading consists in verifying that this work meets the requirements of the plans, details and specifications.
2. Placement of topsoil/planting soil and final grading should be included in the most representative items of the bidding price schedule.
3. The owner does not make any separate payments for topsoil/planting soil and final grading.

END OF SECTION

Sodding

Issued for tender 2018-11-09

PART 1. GENERAL

1.1 Related requirements

.1 Section 32 91 21 – Topsoil placement and fine grading

.2 Section 01 33 00 – Submittals procedures

1.2 Scope of work

.1 This section describes the provision and placement of sod and its maintenance during the establishment period. The Contractor must provide material, labor and equipment necessary for sodding of surfaces, as specified.

1.3 References

.1 NQ 0605-200 – Tree and horticultural maintenance.

.2 NQ 0605-300 – Nursery and turf products.

1.4 Quality control

.1 Test Reports: submit test reports certifying that products, materials and equipment meet the requirements for physical characteristics and performance criteria.

.2 Certificates: submit documents signed by the manufacturer, certifying that products, materials and equipment meet the requirements for physical characteristics and performance criteria.

.3 Pre-Installation Meeting: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements.

1.5 Delivery, storage and handling

.1 Establish a schedule of deliveries, so as to minimize the storage period on site, without causing delays in the execution of work.

.2 Only transport, unload and store sod plates on pallets.

.3 Deliver sod within 24 hours of field pick-up and install within 36 hours of field pick-up.

.4 It is forbidden to deliver sod patches which are too small, asymmetrical or broken.

.5 In wet weather, allow sod patches to dry sufficiently to prevent breakage when picking up and handling.

.6 In dry weather, protect sod patches so they do not dry completely and water them well enough to maintain vitality and prevent soil from loosening during handling. Dry sod patches will be refused.

1.6 Work schedule

.1 Establish schedule for installation of sod to coincide with surface preparation.

.2 Set the schedule so that sod is laid once the ground has thawed.

1.7 Waste management and disposal

.1 Send unused amendment products (fertilizer) to approved hazardous materials collection site.

.2 It is forbidden to dump unused fertilizer products into sewers, streams, lakes, on the ground or in any other place where it could pose a health hazard or the environment.

1.8 Measurement and payment

.1 . Measurement for payment of sodding will be made by square meter including topsoil

1.9 Payment

.1 Payment for supply and installation of sodding will be made at unit price in bidding schedule.

.2 Price includes the supply and placement of **150 mm** of topsoil and all materials, materials and labor required to perform the work according to plans, details, cuts. and profiles and these specifications.

PART 2. PRODUCTS

2.1 Materials

Grass patching must be done with turf grass that meets the following criteria:

.1 Number One Turf Grass Nursery Sod: sod that has been especially sown and cultivated in nursery fields as turf grass crop. Standard NQ 0605-300.

.2 Turf Grass (sod): Turf quality and source of supply must comply with the standards outlined in Section 17 of the 1978 « Guide Specification for Nursery Stock », published by the Canadian Nursery Association and related businesses.

.3 Turf Grass Nursery Sod quality:

.1 Not more than 2 broadleaf weed or 10 other seeds per 40 square meter.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.4 Wooden pegs: 17 x 17 x 200 mm approved.

.5 U-shaped steel hooks (crampillons) 200 mm long, approved.

.6 Water

.1 Clean water, free of impurities that could prevent growth.

.2 Free water supply for plant watering.

.3 Contractor must obtain water supply from the municipal Public Works garage after having made a request to the designated professional.

.7 Fertilzer

.1 To Canada "Fertilizers Act" and Fertilizers Regulations.
.2 Granular fertilizer, type 10-25-10 follow manufacturer's instructions.

.8 Topsoil : in acccordance to section 32 91 21 of these specifications.

2.2 Source quality control

.1 The PCA Representative reserves the right to approve the sod material at the source of supply.

.2 When proposed source of sod is approved, use no other source without written authorization from PCA Representative.

PART 3. EXECUTION

3.1 Examination

.1 Verify that grades are correct and surfaces prepared in accordance with Section 32 91 19 – Topsoil Placement and fine grading. If discrepancies occur, notify PCA Representative and commence work only when instructed by PCA Representative.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grade surface free of humps and hollows to smooth, even grade to contours and elevations indicated, to tolerance of plus or minus 8 mm, for Turf Grass Nursery Sod, in order for surface to drain naturally.

.4 Remove weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials, and dispose of them off site, where specified and approved by PCA Representative.

3.2 Sod placement

.1 Before beginning sodding work, have level, topsoil and all grading approved.

.2 Once topsoil is in place, apply the granular fertilizer according to the manufacturer's recommendations and at the minimum rates specified in 2.1.7.

.3 Lay sod within 24 hours of being lifted if temperature exceeds 20 degrees Celsius.

.4 Lay sod during growing season, from spring frost thaw to fall frost. It is forbidden to lay sod when the weather is too hot or too dry, when the temperature is below freezing or on frozen ground.

.5 Start laying sod at bottom of slopes.

.6 Lay sod in rows, perpendicular to the slope, flush with adjacent surfaces and with staggered joints. Sod sections must be perfectly juxtaposed, but not overlapped. Using a sharp knife, cut the uneven or thin sections.

.7 Roll with a light roller so that the sod sections are adhering well to the ground. It is forbidden to roll with a heavy roller to correct surface irregularities. If the surface soil is dry, sod must be watered before rolling.

.8 Once sod has been laid, it must be watered so that the moisture penetrates turf and soil to a depth of 100 mm.

.9 Prevent erosion with adequate methods on sodded areas. Protect against any damage that may be caused by mechanical devices. Do not remove the protective devices until the sodded areas have been accepted.

3.3 Sod placement on slopes and pegging

.1 Place geotextile in locations indicated or in slopes greater than 2: 1 and secure properly according to manufacturer's instructions.

N.B. First digit represents the length and second digit the height (ex.3: 1).

.2 Start laying sod at bottom of slopes.

.3 Peg sod on steep slopes, that is to say steeper than 3 horizontal to 1 vertical, within 1 m of manholes, catch basins and within less than 1 m of drainage channels and ditches. Arrange the pegs as follows:

.1 100 mm below top edge at 200 mm on centre for first sod sections along contours of slopes;

.2 not less than 3 pegs per square metre.

.3 at least 6 stakes per square meter, in the case of surfaces adjacent to runoff systems; modify the pegging arrangement as directed by the PCA Representative;

.4 Drive pegs so to have them flush above soil surface of sod sections.

3.4 Fertilizing program

.1 Spread granular fertilizer 10-25-10 (see article 2.1.7) during sod establishment and warranty periods according to manufacturer's specifications.

3.5 Maintenance during establishment period

.1 Perform following operations from time of installation until acceptance:

.2 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 100 mm.

.3 Cut grass to 60 mm when or prior to it reaching height of 75 mm. Cut grass again each time grass reaches 100 mm. Do not cut grass when it is wet. Take away grass cuttings from mowing.

.4 Maintain sodded areas 95% weed free.

.5 Spread 10-25-10 granular fertilizer on turf areas in accordance with established fertilizer program. Apply half of the required amount of fertilizer in one direction, then spread the rest perpendicularly; water well to penetrate the fertilizer into the soil

3.6 Acceptance

.1 Turf grass nursery sod areas will be accepted by Parks Canada Representative provided that :

.1 Sodded areas are properly established.

.2 Sod is free of bare and dead spots.

.3 No surface soil is visible from height of **1500 mm** when grass has been cut to height of **75 mm**.

.4 Sodded areas have been cut minimum 2 times prior to provisional acceptance and have reached sufficient density and roots.

.2 Areas sodded in fall will be accepted the following spring, one month after start of growing season, provided acceptance conditions are fulfilled.

3.7 Maintenance during warranty period

.1 Perform following operations from time of acceptance of sod work until end of warranty period. **Warranty period is (1) full year** beginning on the date of provisional acceptance of the work.

.2 Repair and re-sod bare areas and dead grass areas to the satisfaction of the PCA Representative.

.1 Spread granular fertilizer on sodded areas in accordance with established fertilizer program. Apply half of the required amount of fertilizer in one direction, then spread the rest perpendicularly; water well to allow fertilizer to penetrate into the soil.

.2 Remove weeds mechanically in a proportion acceptable to the Parks Canada Representative.

.3 Proceed with soil aeration during season following the installation of sod.

3.8 Cleaning

.1 Upon completion of sodding, remove surplus materials, waste materials, tools and safety barriers.

END OF SECTION

PART 1 - GENERAL

1.1 Scope

.1 Section Content: planting material, materials and products associated with planting and planting methods, staking, mulching and related maintenance procedures.

1.2 Related requirements

.1 Section 32 91 21 – Topsoil placement and fine grading

1.3 Labor

.1 Contractor must be a member of the Association des Paysagistes Professionnels du Quebec (APPQ), or Contractor must have on the work team an employee with a certificate or diploma of collegial studies in horticulture and arboriculture with a minimum of two years of experience, or the Contractor must demonstrate to the satisfaction of the Parks Canada Representative, that he is able to perform work in accordance with state of the art in the field of horticulture and arboriculture, in particular by indicating his experience acquired in similar projects.

1.4 Definitions

.1 Mycorrhiza: association between fungus and roots of plants. This symbiosis, enhances plant establishment in newly landscaped and imported soils.

1.5 Action and informational submittals

.1 Submit required documents and samples in accordance with the general conditions of the contract. See section 01 33 00.

.2 Submit product data sheets for following products:

- .1 fertilizer;
- .2 mycorrhizae;
- .3 anti-desiccant agent;
- .4 guying system, including cable ties, clamps, guy wires, anchors and turnbuckles;
- .5 mulch.

.3 Submit samples for :

- .1 mulch.

.4 No plant substitution will be accepted without the written authorization of Parks Canada Representative.

.5 Plant purchase order proof: Two weeks after contract signature of Contractor must provide proof of firm order of plants to its suppliers. Contractor must send the PCA Representative a copy of the purchase order from each of his suppliers. The voucher must include at least the following information:

- .1 confirmation order date;

.2 list of plants ordered and reserved;

.3 contact details of supplier :

- phone number;
- name of representative;
- company name.

1.6 Quality assurance

.1 Health and safety: take the necessary health and safety measures in accordance with the general conditions of the contract.

.2 Quality control at source :

.1 Plants must be approved before planting.

.2 Imported plants must be accompanied by all necessary permits and in accordance with the regulations of the federal and provincial governments.

.3 PCA Representative reserves the right to approve plants at the source of supply.

.4 Contractor shall inform the PCA Representative of the supply source at least 15 days prior to delivery of the plants and obtain approval prior to commencing the work described in this section.

.5 Plants temporarily approved at the source of supply may be refused at the site prior to planting due to their condition following delivery or damage caused during delivery or handling.

.6 Plants that have not been provisionally approved at the source of supply will be inspected directly on site.

.7 Plants must be formally inspected by the Project Authority prior to planting and must have final approval for use for planting purposes.

.8 Final approval for use for planting purposes does not preclude the eventual rejection of the plants due to failure to properly grow during the warranty period.

.9 Plants, including bulbs, must have been grown in a nursery; they must not have been taken in the wild.

1.7 Delivery, storage and handling

.1 Protect plant material from frost, excessive heat, wind and sun during delivery.

.2 Immediately store and protect plant material which will not be installed within 1 hour after arrival at site in storage location approved by PCA

Representative.

.3 Protect plant material from damage during transportation:

.1 Delivery distance is less than 30 km and vehicle travels at speeds under 80 km/h, tie tarpaulins around plants or over vehicle box.

.2 Delivery distance exceeds 30 km or vehicle travels at speeds over 80 km/h, use enclosed vehicle where practical.

.3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.4 Protect stored plant material from frost, wind and sun and as follows:

.1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in sand or topsoil and watering to full depth of root zone.

.2 For pots and containers, maintain moisture level in containers. Heel-in fibre pots.

.3 For balled and burlapped and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

.5 Waste management and disposal :

.1 Remove from site all packaging materials and return to appropriate recycling facilities.

.2 Place all paper, plastic, polystyrene and corrugated packaging materials in appropriate on-site recycling bins in accordance with Waste Management Plan (WMP).

.3 Separate steel, metal and plastic waste for reuse and recycling in accordance with Waste Management Plan.

.4 Place in designated containers substances that meet the definition of toxic or hazardous waste.

.5 Handle and dispose of hazardous materials in accordance with the Canadian Environmental Protection Act, the Transportation of Dangerous Goods Act and regional and municipal regulations.

.6 Transport unused metal components to a metal recycling facility authorized by the PCA Representative.

.7 Fold metal strapping, flatten and place in designated area for recycling.

.8 Send unused plastic plant containers to a plastic recycling facility authorized by the PCA Representative.

.9 Transfer unused fertilizer to an approved hazardous material collection site authorized by the PCA Representative.

.10 Send unused anti-desiccants to an approved hazardous materials collection site authorized by the PCA Representative.

.11 Send unused wood and mulch to recycling or composting facility authorized by PCA Representative.

1.8 Work schedule

.1 Submit schedule of work to PCA Representative for review ten (10) days prior to delivery of the plants.

.2 Schedule of work must include the following information:
- .1 date of provisional approval of plant material at supply source by Project Authority, if applicable;
- .2 type and number of plants;
- .3 delivery dates;
- .4 dates of arrival at construction site;
- .5 planting dates.

1.9 Provisional acceptance

.1 Provisional acceptance: Issued after completion of planting of trees, shrubs and perennials.

1.10 Final acceptance

.1 Issued in accordance with the following conditions:

.2 At the end of the one **(1) year warranty period**;

.3 After completion of all replacement work for trees or shrubs that are defective under the warranty;

.4 When plant viability can be determined beyond doubt by full leafing;

.5 According to the latest date to occur in relation to the previous conditions.

.6 If the end of warranty period occurs at a time of the year not conducive to full leafing of plants and that final acceptance is postponed for several months until the next growing season, the Contractor's responsibility on those plants continues until final acceptance.

1.11 Warranty

.1 Warranty period for trees, shrubs and perennials:

.1 The Contractor hereby warrants that the plants on the plant list will remain free from defects **for a period of one (1) full year** commencing on the date of the provisional acceptance

of the planting Work. The planting work is subject to a single audit, provided adequate maintenance has been provided.

.2 The Site Supervisor shall inspect plants in accordance with sections 1.9 and 1.10 of this section.

.3 The Site Supervisor reserves the right to extend the Contractor's responsability for an additionnal year if, at the end of the initial warranty period, leaf development amd growth do not appear sufficient to ensure the future survival of the plants.

.4 The warranty must include the supply of labor, plants, equipment and tools necessary to replace all the plants supplied by the Contractor that do not meet the growth conditions required on the plans and specifications, until the end of the warranty period.

.5 The replacement of trees and shrubs must be done with healthy plants of the same species, size and type as the original, unless otherwise authorized by the landscape architect.

.6 All planting material and methods used for plant replacement must meet all specifications of these technical and administrative clauses.

.7 Replace any tree or shrub that has more than 25% of its crown unhealthy and declining.

.8 Remove and replace dead trees and shrubs within 10 days of notice by Site Supervisor. If the trees and shrubs are not removed within ten days of this notice and the replacement is not made within the period specified in the specifications, the Site Supervisor will have the work done at the expense of the Contractor and the amounts will be deducted from the remaining amount to pay or from he execution deposit. This cost will not be questionable by the Contractor.

PARTIE 2 - PRODUCTS

2.1 Plant material

.1 Type of root preparation, sizing, grading and quality: comply to Canadian Standards for Nursery Stock.

.1 Source of plant material: grown in Montreal metropolitan zone (Quebec) in accordance with Plant Hardiness Zones in Canada.

.2 Plant material must be planted in zone specified as appropriate for its species.

.3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

.5 Native plants: maximum 60 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.

2.2 Water

.1 Drinkable and free of impurities that would inhibit plant growth.

2.3 Stakes

.1 Galvanized steel, not serrated, 2750 mm long, weighing 2 kg/meter (T-shaped), and factory-honed at one end.

2.4 Tree tie

.1 Pro-tie tree tie : Derco, model # 18480 Pro-Tie, tel: 1-819-395-4559 or equivalent approved by PCA Representative.

2.5 Rodent protection

.1 Product : Nortene by Dendrotik.
http://www.dendrotik.com/fr/produit/protecteur-d-arbres-nortene/

.2 Trunk base protection: Model PT222 from DSD International Inc, tel. : 1-888-334-8001 or equivalent approved by PCA Representative.

2.6 Rodent repellent

.1 Thiram-based, specifically prepared to prevent rodents from gnawing trees.

2.7 Fertilizer

.1 Compound fertilizer type 5-10-5 with 50% nitrogen from sulfur-coated urea.

2.8 Mycorrhizea

.1 Mycorrhizae type Myke Pro Landscaping · G as manufactured by Premier Tech Biotechnologies (Tel: 1-800-606-6926) or approved equivalent.

.2 Compliance of the granular product with mycorrhizae will be validated by transmission to Parks Canada Representative of purchase invoice copies, delivery notes and batch numbers indicated on the manufacturer's label on each packaging bag.

2.9 Nylon clip

.1 Serrated nylon clip, 300 mm x 5 mm, black color.

2.10 Snow fence

.1 New wood fence, green color, 1200 mm high.

2.11 Mulch

.1 Non-flammable brown cedar mulch (100% natural cedar mulch) as supplied by Cedra Inc. (Tel: 450-447-5882) or approved equivalent. The origin of the mulch must be validated by the submission of a copy of the

purchase invoice and the delivery note to the project manager.

2.12 Binding rope

.1 Binding rope No 111-018070.

2.13 Anti-desiccant

.1 Wax-like emulsion.

2.14 Flagging tape

.1 Fluorescent – red or orange color.

2.15 Source quality control

.1 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

PARTIE 3 – EXECUTION

3.1 Pre-planting preparation

.1 Take the necessary health and safety measures in accordance with the general conditions of the contract.

.2 Proceed only after receipt of acceptability of plant material from PCA Representative.

.3 Remove damaged roots and branches from plant material.

.4 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

3.2 Excavation and preparation of planting beds

.1 Establishment of sub-grade for planting beds in accordance with Section 31 14 11 - Rough Grading.

.2 Preparation of planting beds in accordance with Section 32 91 21 - Topsoil Placement and Fine Grading.

.3 For individual planting holes:

.1 Stake out location and obtain approval from PCA Representative prior to excavating.

.2 Excavate to depth and width as indicated.

.3 The walls of the plantation hole must be sloped: the bottom width of the hole must be approximately the diameter of the root ball, while the opening of the hole must be twice the diameter of the root ball. The depth of the planting hole must be limited to the actual height of the root ball (depending on the level of the collar) and must rest on undisturbed or well-packed soil.

When planting in existing clay soil, the base of the tree (collar) should be ± 75mm above existing soil.

.4 Remove subsoil, rocks, roots, debris and toxic materials from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess materials.

.5 Scarify sides of planting hole.

.6 Remove water which enters excavations prior to planting. Notify PCA Representative if water source is ground water.

3.3 Planting

.1 For bare root stock, place 50 mm backfill soil in bottom of hole. Plant trees and shrubs with roots placed straight out in hole.

.2 For jute burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.

.3 For container stock or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.4 Spread roots at bottom of the planting pit and, if roots system has rolled around itself, cut in 2 to 3 places around the root ball, for plants in container.

.5 Plant vertically in locations as indicated. Orient plant material to give best appearance in relation to structure, roads and walks.

.6 Trees and shrubs :

.1 Backfill soil in 150 mm lifts and tamp each lift to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade

.2 Form watering saucer as indicated.

.7 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.

.8 Water plan material thoroughly.

.9 After soil settlement has occurred, fill with soil to finish grade.

.10 Dispose of burlap, wire and containers off-site.

3.4 Tree support

.1 Install stakes on **prevailing wind side (southwest orientation)**. Drive **stakes (2)** of 1500 mm long into the ground (1250 mm above grade). Install the stakes during planting and install a tree tie. Attach the tree tie to the end of the stake.

.2 Install at the base of each tree the DSD International Inc "Model PT222" trunk protector and the Dendrotik Nortene rodent protector. The height of the wrapped sheath on the trunk must be at least 800 mm. The length of the sheath must be 500 mm, to ensure an overlap. Contractor must leave enough room for the tree to grow during the establishment period.

.3 Use 3 guy wires and anchors for deciduous trees bigger than 75 mm diameter and evergreens greater than 2 m in height.

.1 Use Type 2 guying wire with clamps for trees less than 75 mm in diameter and Type 3 guying wire with clamps for trees greater than 75 mm in diameter.

.2 Use Type 1 anchors for trees less than 75 mm in diameter and Type 2 anchors for trees greater than 75 mm in diameter.

.3 Install guying collars above branch to prevent slipping at approximately 2/3 height for evergreens and 1/2 height for deciduous trees. Collar mounting height not to exceed 2.5 m above grade.

.4 Guying collars to be of sufficient length to encircle tree plus 50 mm space for trunk clearance. Thread guy wire through collar encircling tree trunk and secure to lead wire by clamp or multi-wraps; cut wire ends close to wrap. Spread lead wires equally proportioned about trunk at 120 degrees.

.5 Install anchors at equal intervals about tree and away from trunk so guy wire will form 45 degree angle with ground. Install anchor at angle to achieve maximum resistance for guy wire.

.6 Attach guy wire to anchors. Tension wire and secure by installing clamps.

.7 Install wire tightener ensuring that guys are secure and leave room for slight movement of tree.

.8 Saw tops off wooden anchors which extend in excess of 100 mm above grade or as directed by designated Professional.

.9 Install flagging tape to guys as indicated.

3.5 Mulching

.1 Ensure soil settlement has been corrected prior to mulching. Add soil if needed.

.2 Spread mulch on damp soil to a depth of at least **75 mm.** Pre-moisten the soil as needed.

.3 Moisten mulch after installation.

3.6 Planting pruning

.1 Plants require little pruning at the time of planting, if transported appropriately. Use clean and well-honed tools.

.2 Cut dead, broken, desiccated or too long roots from shrubs or small trees in containers.

.3 Cut branches or portions of branches that are dead, desiccated or

damaged.

.4 Remove stems, stem portions or dead stems, dried and damaged branches.

.5 Cut back healthy stems or branches, if very long and not dense at the base, according to the specific needs of the species or cultivar.

3.7 Fertilization and mycorhizae

.1 Fertilization: Spread uniformly 1 kg of fertilizer of formula 5-10-4 per 15 m² over the entire surface of planting beds, shrubs and perennials.

.2 Mycorhizae: follow the manufacturer's specifications, but at least the following quantities:

.1 trees: add 500 ml of mycorrhizae per tree to the planting hole;

.2 shrubs: incorporate in the planting hole 100 ml of mycorrhizae per shrub;

.3 perennials: add 30 ml per perennial to the planting hole.

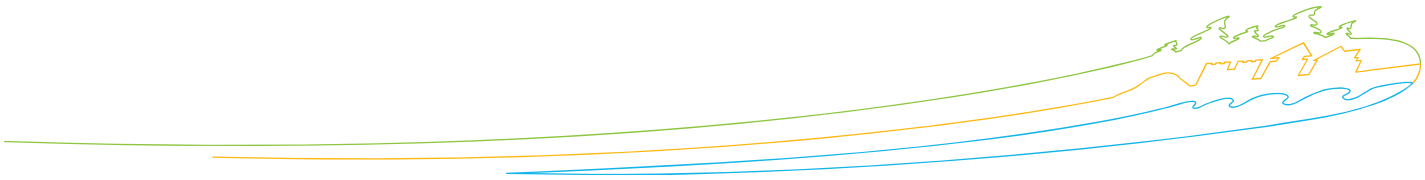
3.8 Measuring and payment

.1 Measurement of planting of trees, shrubs and ground covers consists in verifying that this work complies with the requirements of the plans, details and these specifications.

.2 Work of planting trees, shrubs and ground covers must be included in the representative articles of the price schedule.

END OF SECTION

Parcs Canada Parks Canada



CIVIL ENGINEERING SECTION – ISSUED FOR TENDER

Securing of multi-use pathway of Lachine Canal national historic site, Montreal

APPROACHES TO SIR GEORGES-ETIENNE-CARTIER FOOTBRIDGE

Parks Canada Agency

November 09, 2018

Canada

Seals and signatures page

Issued for tender

PARKS CANADA

Multi-use pathway of Lachine Canal National Historic Site

Approaches to Sir George-Etienne-Cartier footbridge

TECHNICAL SPECIFICATIONS - CIVIL

FOLDER: 653793

DATE: November 9, 2018

2018-11-09

Approved by: _____

Sevy Tremblay, Eng.

Special Procedures - Contaminated Sites

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 SCOPE OF SECTION 01 35 13.43

.1 This section is part of the management of contaminated materials and not part of the site environmental rehabilitation.

.2 Any delays in the management of contaminated materials shall not be used by the Contractor as grounds for any claim or demand against the PCA Representative.

1.2 ANTICIPATED ENVIRONMENTAL CONDITIONS

.1 Provincial criteria are those of the MDDELCC's Intervention Guide - Soil Protection and Contaminated Sites Rehabilitation (Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés).

.2 The Contractor shall take into account that the excavation zone contains clean soils (<A), contaminated soils at various levels (<B, B-C), and that it may contain buried and hazardous residual materials. The Contractor shall carry out the environmental management of excavation material and infiltration of contaminated water accordingly, including loading, transportation and disposal, in accordance with applicable laws, regulations and policies.

1.3 RELATED REQUIREMENTS

.1 All sections of Divisions 01 - General Requirements and 02 - Existing Conditions.

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

1.4 REFERENCES

.1 Canadian General Standards Board (CGSB).

.1 CGSB 51-GP-51M-[81], Polyethylene Sheet for Buildings.

.2 Canadian Council of Ministers of the Environment (CCME) Documentation.

.3 Government of Quebec, MDDELCC.

.1 Environment Quality Act (RQA, c. Q-2).

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

.3 Regulation respecting the storage and transfer centers of contaminated soils (Q-2, r.46).

.4 Regulation respecting the storage and transfer centers of contaminated soils (c. Q-2, r.46).

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

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

.7 Transportation of Dangerous Goods Regulations (c.-24.2, r.43).

.8 By-law 2008-47 respecting water purification in the Communauté métropolitaine de Montréal (CMM).

.9 Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés, MDDELCC, 2016.

.10 Soil Protection and Brownfield Remediation Policy - Action Plan 2017-2021, MDDELCC, 2017.

1.5 DOCUMENTS/SAMPLES TO BE SUBMITTED FOR APPROVAL/INFORMATION

.1 Submit the required documents and samples in accordance with section "01 33 00 - Documents and Samples to be Submitted".

.2 Submit a contaminated soil management plan at least one week prior to the commencement of on-site work. The plan must be submitted to the PCA Representative for approval.

.3 Submit, at least one week prior to the commencement of on-site work, a management plan for the contaminated soil handling equipment decontamination area. The plan must be submitted to the PCA Representative for approval.

.4 Submit, at least one week prior to the commencement of on-site work, an off-site excavation management plan. The plan must be submitted to the PCA Representative for approval. The Contractor is responsible for the research and selection of authorized disposal sites, and must provide, before excavation work begins, certificates of authorization (CA) for authorized sites for each type of contaminated material according to the ranges identified in the regulations in order to ensure that contaminated soils are accepted at sites according to their level of contamination.

.5 Documents to be submitted for progress meetings: submit the following documents at least 24 hours before the bi-weekly project follow-up meeting:

.1 Copies of transportation manifests and weigh tickets produced by the off-site disposal organization.

PART 2 EXECUTION OF WORK

2.1 NATURE OF THE WORK

.1 All contaminated soils to be excavated shall be disposed of in accordance with the contaminated soils management plan prepared by the Contractor.

.2 Excavation and disposal shall be selective so as not to mix excavated material with potentially different levels of contamination. At no time should soil debris be mixed. There should be no segregation of types of cuttings.

.3 Once the degree of contamination of temporarily stored soil is known, the Contractor shall forward the soil to a treatment centre or disposal site authorized by the MDDELCC.

.4 Contaminated soils shall be disposed of in authorized, pre-approved sites located in Quebec.

2.2 REGULATORY REQUIREMENTS

.1 Work must meet or exceed the minimum requirements of applicable federal and provincial laws and regulations.

.1 The Contractor shall ensure compliance with changes in laws and regulations once implemented.

.2 If regulatory requirements are beyond the scope of the work or conflict with specific contractual requirements, notify the PCA Representative immediately.

.3 The Contractor is responsible for the search and selection of authorized disposal sites and shall obtain and provide to the PCA Representative the required authorizations (AC) under applicable federal and provincial laws and regulations.

2.3 SEQUENCING AND SCHEDULING

.1 The Contractor may not commence soil excavation work until the off-site management plan is approved by the PCA Representative.

2.4 TEMPORARY STORAGE OF EXCAVATED SOIL

.1 Soil characterization was performed prior to work. The report is available as an appendix to the technical specifications.

2.5 CONTAMINATED WATER

.1 Where the water in the excavation shows organoleptic signs of contamination, the Contractor shall pump it and temporarily store it on site in watertight containers until the Contractor obtains a permit for discharge to the City of Montreal sewers, based on the results of chemical analyses of the water by an environmental firm. Before any discharge of infiltration water into sewers, it must be ensured that its quality meets the standards prescribed in the municipal regulations in force. If these results do not meet the criteria established by the CMM, the recovered water cannot be discharged into the sewers and must be transported to an authorized location for treatment, all at the Contractor's expense.

.2 The Contractor shall provide clean, sealed aboveground storage tanks for dewatering excavations. The capacity of the storage tanks depends on the volumes of water to be managed, and their number must be sufficient not to slow down the dewatering work.

2.6 EQUIPMENT DECONTAMINATION FACILITY

.1 Before commencing work involving contact of equipment with contaminated materials, construct a decontamination area capable of handling the largest piece of equipment at the site that is likely to be contaminated.

.2 Provide, use and maintain the decontamination facilities provided in the equipment decontamination area management plan.

.3 The equipment decontamination area management plan shall include, as a minimum, measures aimed at :

.1 Remove dirt, abrasive particles and debris from equipment by mechanical means such as brushes and scrapers; in order to reduce water consumption and the

amount of contaminated rinsing fluids, steam or high-pressure water jets are not to be used,. If necessary only, and subject to the approval of the PCA Representative, a jet of hot water or steam at high pressure and low flow may be used, with the addition of a suitable detergent or solvent. Pay particular attention to tire tread, tracks, springs, joints, pinions and undercarriage. Rub surfaces with long-handled scrub brushes using a cleaning agent; rinse cleaned surfaces and recover rinsing fluids. Allow equipment to air dry in the uncontaminated area before removing it from the site or moving it to uncontaminated areas.

.2 Assess the effectiveness of decontamination as directed by the PCA Representative.

.3 Maintain and keep up to date an on-site inspection log containing the following information: equipment descriptions, including identification numbers or license plates, time and date of entry into the decontamination facility, time and date of exit from the decontamination facility, inspector's name and confirmation of inspection completion.

.4 Allow the PCA Representative to inspect decontaminated equipment before it is removed from the site and/or moved to clean areas.

.5 Minimize transport of spray droplets during decontamination.

.6 Collect waste water from decontamination activities that has accumulated in the equipment decontamination area.

.7 Transfer wastewater to authorized disposal sites.

2.7 REMOVAL AND DISPOSAL

.1 The exterior and the wheels of the Contractor's trucks carrying contaminated soil shall be clean prior to leaving the site to prevent the spread of contaminated soil off site. If necessary, the Contractor shall install a truck wheel washing station. In this case, contaminated water and accumulated sludge must be managed at the Contractor's expense, in accordance with current standards, and disposed of at authorized sites.

.2 With reference to the Transportation of Dangerous Goods Regulations, contaminated soil is a hazardous material. Contaminated soil must be transported in a closed container or dump vehicle. When contaminated soil is transported in a dump vehicle, an waterproof tarp must completely cover the top of the dump body to prevent rain or snow from entering or contaminant from escaping. The container or dump box must be watertight.

.3 Dispose off-site of all equipment and materials stored in the temporary storage area in accordance with the off-site waste management plan approved by the PCA Representative.

.4 Provide, operate and maintain the equipment specified in the off-site waste management plan.

.5 The off-site excavation management plan shall include, as a minimum, measures aimed at :

.1 Provide, prior to the commencement of excavation work, Certificates of Authorization (COA) for licensed sites for each type of contaminated material within the ranges identified in the regulations to ensure that contaminated soils are accepted at sites according to their level of contamination.

.2 Provide spill kits for on-site spill recovery.

.3 Minimize dust emissions from excavation loads. Tarps should be installed on all trucks carrying the excavated material.

.4 Obtain a transportation manifest for each load of soil or leachate to be sent off-site for authorized disposal. Transport manifests are prepared by the PCA Representative and given to the driver/carrier. The information required on the transport manifest is as follows:

.1 The name of the carrier.

.2 Vehicle registration.

.3 Date.

.4 Departure and arrival times of the load.

.5 The origin of the load.

.6 Type of soil transported ("A-B", "B-C",">C").

.7 The destination to which the charge is to be taken

.8 Signature of the PCA Representative (coupon issuer).

.9 Signature of disposal site representative.

.6 Distribute copies of transportation manifests as follows:

.1 A copy of the transportation manifest shall be retained by the PCA Field Representative.

.2 A copy of the transportation manifest is retained by the disposal site representative.

.3 A copy of the transportation manifest shall be returned to the Contractor and the supervisor duly completed for compilation on the payment slip.

.4 A copy is retained by the carrier.

.5 Ensure that the PCA Representative will take possession, upon return of the trucks to the site, of the weigh tickets issued at the disposal site.

2.8 REGISTERS

.1 The Contractor shall provide the PCA Representative with a daily work report indicating the quantities of excavated material disposed of off-site.

Special Procedures - Contaminated Sites

Issued for tender 2018-11-09

PART 3 WORK SUPERVISION

3.1 RESPONSIBILITIES OF THE CONSULTANT

.1 Environmental monitoring of excavation and excavation management are the responsibility of the PCA Representative. The tasks of the PCA Representative will include :

.1 Approving material disposal sites following preliminary research and disposal site selection by the Contractor.

.2 Monitor off-site disposal of excavation material.

.3 Compile weigh tickets.

.2 Contractor Responsibilities.

.1 The Contractor shall notify the PCA Representative at least 48 hours prior to the performance of any work covered by this section of the specifications.

.2 The Contractor is responsible for ensuring the compliance of recommended disposal or disposal sites. It must also ensure that contaminated materials can be transported there without problems, depending on their level of contamination, regardless of their water content.

.3 The Contractor shall research and make preliminary selection of disposal sites and provide the CA for approval to the PCA Representative.

.4 The Contractor shall follow the instructions of the PCA Representative in all stages of environmental monitoring of excavation and excavation management.

END OF SECTION

Concrete forming

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 All sections of Division 01 - General Requirements.

.2 Section 03 20 00 - Concrete Reinforcing.

.3 Section 03 30 00 - Cast in Place Concrete.

1.2 REFERENCES

.1 Unless otherwise specified, the latest publication and amendments to the following standards shall prevail on the effective date of the contract.

.2 Canadian Standards Association (CSA)/CSA International.

.1 CAN/CSA-A23.1/A23.2-14, Concrete - Components and Performance of Work/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-086-14, Design Rules for Wood Framing.

.3 CAN/CSA O86S1 F05 Supplement Number 1 to CAN/CSA-086-01.

.4 CSA O121-08 (C2013), Douglas Fir Plywood.

.5 CSA O151-09 (C2014), Canadian Softwood Plywood.

.6 CSA O153-13, Poplar Plywood.

.7 CAN/CSA O325-16, Sheathing Construction.

.8 CSA O437 -93 (C2011), Oriented Strand Board and Large Particle Board Standards.

.9 CSA S269.1-16, Temporary Structures and Forms.

.10 CAN/CSA-S269.3-M92 (C2013), Forms, National Standard of Canada.

.3 Ministère des Transports, Mobilité durable et Électrification des transports du Québec.

.1 MTMDET – Cahier des charges et devis généraux (CCDG 2018).

.4 Council of Forest Industries of British Columbia (COFI).

.1 COFI, Exterior Plywood for Concrete Formwork.

.5 Official Publisher of Quebec.

.1 S-2.1, r.6; Construction Safety Code.

.6 Where applicable, always refer to the latest version of applicable codes and standards.

1.3 DOCUMENTS/SAMPLES TO BE SUBMITTED FOR APPROVAL/INFORMATION

.1 Submit the required documents and samples in accordance with section "01 33 00 - Documents and Samples to be Submitted".

.2 Provide documentation and samples to be submitted, and coordinate requirements with those specified therein.

1.4 TRANSPORTATION, STORAGE AND HANDLING

.1 Store and manage hazardous materials in accordance with "01 35 43 - General Requirements - Environmental Protection".

.2 Waste Management and Disposal.

.1 Sort waste for reuse or recycling in accordance with section "01 74 21 - Construction/Demolition Waste Management and Disposal".

.2 Place substances that meet the definition of toxic or hazardous waste in designated containers.

.3 Transport unused wood to a recycling or reuse facility authorized by the PCA Representative.

.4 Transport unused plastic to a recycling or reuse facility authorized by the PCA Representative.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Formwork Materials.

.1 For pouring concrete without special architectural features, use wood and wood products forms conforming to CAN/CSA-O86. The use of steel forms is also permitted.

.2 Tubular column formwork: cylindrical formwork made of laminated fiberboard spirally wound and coated with a release agent on the inside.

.3 Release Agent: Non-toxic, biodegradable, low VOC content.

.4 Mould release oil means a colorless, non-toxic, biodegradable, low VOC, kerosene-free mineral oil with a Saybolt Universal viscosity in seconds of not less than 70 and not more than 110 at a temperature of 40 °C and an open crucible flash point of not less than 150°C.

PART 3 EXECUTION

3.1 CONSTRUCTION AND ASSEMBLY

.1 Before beginning formwork construction, check lines, levels and centers to ensure that the dimensions match those shown on drawings.

.2 Obtain authorization from the PCA Representative before pouring concrete directly into the ground or reserving openings in forms that are not shown on drawings.

.3 Before pouring concrete directly into the ground, erect the walls and bottom of the excavated area, then remove loose soil.

.4 Fabricate and erect forms in accordance with CAN/CSA-S269.3 to provide finished concrete structures in the specified shape, size and level and at the specified locations, within the tolerances specified in CSA-A23.1/A23.2.

.1 Align form joints and seal them to prevent cement and water loss.

.2 Minimize the number of joints appearing in forms.

.5 Before pouring concrete, clean forms in accordance with CSA-A23.1/A23.2.

3.2 DEMOULDING

.1 After pouring concrete, leave forms in place for at least 3 days.

.2 The time period specified above represents a cumulative number of hours, days or fractions of days, not necessarily consecutive, during which the ambient temperature has remained at least 10°C.

.3 Remove the forms when the concrete has reached 70% of its design strength or after the previously specified minimum curing period, whichever comes first, and immediately replace the appropriate props.

.4 Concrete cure must continue for 7 days. The Contractor must plan to apply the cure to any stripped surface before this 7 day period.

.5 Reuse forms, subject to CSA-A23.1/A23.2 requirements.

.6 Taking into account the atmospheric conditions, the concreting process and the curing conditions, the Engineer may specify the minimum time that must be respected before the various castings are stripped.

3.3 FORMWORK TEMPERATURE

.1 When pouring concrete, maintain forms at a temperature above 10°C.

END OF SECTION

Concrete reinforcing

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 All Division 01 - General Requirements sections.

.2 Section 03 10 00 - Concrete Forming.

.3 Section 03 30 00 - Cast in Place Concrete.

1.2 REFERENCES

.1 Always refer to the latest version (on the effective date of the contract) of the following standards and their latest amendments.

.2 Ministère des Transports, Mobilité durable et Électrification des transports du Québec.

.1 MTMDET – Cahier des charges et devis généraux (CCDG 2018).

.3 ASTM International.

.1 ASTM A143/A143M-07 (C2014), Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.2 ASTM A82/A82M, last edition, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.3 ASTM A123/A123M, last edition, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.4 Canadian Standards Association (CSA)/CSA International.

.1 CSA A23.1-14/A23.2-14, Concrete materials and methods of concrete construction / Test methods and standard practices for concrete.

.2 CSA G30.5-M1983 (R1998), Welded Steel Wire Fabric for Concrete Reinforcement.

.3 CSA G30.18-09 (R2014), Carbon Steel Bar for Concrete Reinforcement.

.4 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.

.5 CSA G164-M92 (R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

1.3 DOCUMENTS/SAMPLES TO BE SUBMITTED FOR APPROVAL/INFORMATION

.1 The required documents and samples must be submitted in accordance with section "01 33 00 - Documents and Samples to be Submitted".

1.4 TRANSPORTATION, STORAGE AND HANDLING

.1 Deliver reinforcement bars and mesh to job site in clearly marked batches.

.2 Handle reinforcement bars and mesh carefully to avoid deformation.

.3 As soon as delivered on site, the reinforcing bars and mesh should be stacked properly on wood beam so that they are not in contact with the ground.

.4 When there is a risk of snow, cover all stored steel with a woven cloth to protect it from the weather.

.5 Delivery and Acceptance: Deliver materials to the site in its original packaging, which must bear a label indicating the name and address of the manufacturer.

.6 Storage and Handling.

.1 Store materials so that they do not rest on the floor in a clean area as recommended by the manufacturer.

.2 Replace damaged fittings with new ones.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Any replacement of reinforcing bars with bars of different dimensions shall be authorized in writing by the PCA Representative.

.2 High adhesion wire reinforcing mesh: welded steel wire mesh, high adhesion, compliant with ASTM A185A/M.

.1 Mesh shall be supplied in flat sheets only.

.3 For the purpose of this project, all reinforcing bar, mesh and anchor bolts shall be galvanized steel.

.4 Binding wire: annealed and cold drawn steel wire conforming to CSA G30.3.

.5 Chairs, spacers, bar supports and support blocks: compliant to CSA-A23.1/A23.2 standard.

PART 3 EXECUTION

3.1 FOLDING ON SITE

.1 Unless otherwise specified or authorized by the PCA Representative, reinforcing bars shall not be bent or welded on site.

.2 When field bending is permitted, bend bars without heating, slowly applying constant pressure.

.3 Replace bars with cracks or fissures.

3.2 REINFORCEMENT STEEL INSTALLATION

.1 Install elements as required by installation drawings and CSA-A23.1/A23.2 standard.

.2 Obtain prior approval from the APC Representative for reinforcement bars and their placement before pouring concrete.

.3 Ensure reinforcement bar coating integrity is maintained during concrete pour.

.4 Ensure bars are clean and free of dirt, oil or other contaminants. Clean the reinforcing elements before pouring the concrete.

3.3 REINFORCEMENT ELEMENTS COATING

.1 Ensure reinforcing bars are covered with a sufficient concrete cover when pouring.

.2 Unless otherwise indicated on the drawings, the minimum concrete cover of reinforcing bars must be 75 mm.

3.4 FRAMEWORK TEMPERATURE

.1 At the time of concrete pouring, the steel temperature in the formwork shall not be less than 5 degrees Celsius.

3.5 CLEANING

.1 Cleaning during work:

.1 Leave the premises clean at the end of each working day.

.2 Final Cleaning: Upon work completion, remove excess materials, waste, tools and equipment from site.

.3 Waste management: sort waste for reuse or recycling.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

.1 All sections of Division 01 - General Requirements.

.2 Section 03 10 00 - Concrete Forming

.3 Section 03 20 00 - Concrete Reinforcing.

1.2 REFERENCE STANDARD

.1 Unless otherwise specified, the latest publication and amendments to the following standards shall prevail on the effective date of the contract.

.2 ASTM International :

.1 ASTM C260/C260M-[10a], Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C494/C494M-[10a], Standard Specification for Chemical Admixtures for Concrete.

.3 Canadian Standards Association (CSA)/CSA International :

.1 CSA A23.1-14/A23.2-14, Concrete materials and methods of concrete construction / Test methods and standard practices for concrete.

.2 CAN/CSA-A5-93, Portland Cement.

.3 CAN3 A266.1 M78, Air-Entraining Admixtures for Concrete.

.4 CAN3 A266.4 M78, Guidelines for the Use of Admixtures in Concrete.

.4 Ministère des Transports, Mobilité durable et Électrification des transports du Québec :

.1 MTMDET – Cahier des charges et devis généraux (CCDG 2018).

1.3 DEFINITIONS

.1 Portland cement: hydraulic cement or compound hydraulic cement (XXb where "b" indicates compound).

.1 Type GU or GUb: general purpose cement.

.2 Type HE or HEb: high initial strength cement.

1.4 DOCUMENTS/SAMPLES TO BE SUBMITTED FOR APPROVAL/INFORMATION

.1 Unless exempted in writing by the PCA Representative, provide the Laboratory with a document signed by a recognized petrographic specialist certifying that none of the adverse alkali-granulate reactions described in CAN/CSA A23.1 Appendix B are likely to occur in concrete after execution.

.2 Provide mixing formulas for approval by the Laboratory mandated by the PCA Representative and a certificate attesting that the dosage formula selected will produce concrete of the prescribed quality, strength and performance and that meets the requirements of CSA-A23.1/A23.2 standard.

.3 Submit test results and reports to the PCA Representative for review and, in the presence of any divergence from the dosage formula or prescribed concrete mixing parameters, do not proceed without prior written authorization.

.4 Concrete batch: Submit accurate records of concrete being poured indicating the date and location of each batch, concrete quality, air temperature and specimens taken as specified in Section 3.6 - On-site Quality Control.

.5 Concrete Transport Time: submit to the PCA Representative, for review, any deviation greater than the maximum allowable duration of 105 minutes for delivery of concrete to the job site and the pouring.

1.5 QUALITY ASSURANCE AND QUALITY CONTROL

.1 All concrete must be supplied ready to be poured (ready-mix) and must come from a single metering plant that must have ABQ-BNQ certification. The choice of this manufacturer is subject to the approval of the PCA Representative.

.2 The manufacturer of ready-mix concrete is solely responsible for its dosage and shall, at his own expense, take all necessary measures to ensure the quality and consistency of his product.

.3 Provide a certificate that the mixing plant, equipment and materials to be used in the manufacturing of concrete meet the requirements of CSA-A23.1/A23.2.

.4 Provide a certificate that the dosage formula selected will produce concrete of the prescribed quality and performance, whose strength will meet the requirements of CAN/CSA-A23.1 and that the dosage formula has been modified to prevent problems that may be caused by the aggregate alkali reaction.

.5 Submit to the PCA Representative, at least four (4) weeks prior to the beginning of concrete works, a valid and recognized certificate issued by the plant supplying the concrete.

.1 Provide test data, certificates of conformity, data sheets and certification issued by a recognized and independent inspection and testing laboratory confirming that the materials used in the concrete mix and the dosage formula meet the specified requirements.

.6 At least four (4) weeks prior to the commencement of concreting work, submit to the PCA Representative for review the proposed methods for quality control of the following aspects.

.1 Erection of temporary shoring structures.

.2 Hot weather concreting.

.3 Cold weather concreting.

.4 Curing of concrete.

.7 Quality Control Plan: submit a written report to the PCA Representative certifying that the concrete placed meets the performance requirements set out in Article 2.1 - Performance Criteria.

.8 Perform the following tests as per section "01 45 00 - Quality Control" and submit a report as per section "01 33 00 - Documents and Samples for Submission".

.1 Slump tests, temperature and air content measurements for cast-in-place concrete.

.2 On-site sampling of concrete specimens for laboratory analysis.

.3 Ambient temperature readings during concreting.

.9 Inspection and testing of concrete and its components shall be performed by the testing laboratory designated by the PCA Representative, in order to meet his satisfaction and in accordance with CSA Standard A23.1/A23.2.

.10 The test laboratory is certified in accordance with CSA A283 standard.

.11 Ensure that the test results are provided to the PCA Representative for review during the pre-placement meeting.

.12 The laboratory will collect additional specimens during cold weather concreting work.

.13 Curing of the test pieces shall be carried out on site under the same conditions as the concrete batches from which they are extracted.

1.6 TRANSPORTATION, STORAGE AND HANDLING

.1 Delivery and acceptance

.1 Transport Time: Concrete must be delivered to site and unloaded within 105 minutes of mixing.

.1 Any changes to the maximum transportation time, if any, shall be agreed in writing by the PCA Representative and the concrete producer as specified in CSA Standard A23.1/A23.2.

.2 Deviations shall be submitted to the PCA Representative for review.

.2 Concrete Delivery: Ensure concrete plant guarantees continuous concrete delivery in accordance with CSA A23.1/A23.2.

PART 2 PRODUCTS

2.1 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure that the concrete supplier is able to provide concrete that meets the performance criteria established by the PCA Representative and provide quality control measures in accordance with the requirements of "QUALITY ASSURANCE AND QUALITY CONTROL " in PART 1.

2.2 MATERIALS

.1 Cement: for general use, comply with CAN/CSA-A3001, type GU.

.2 Composite Hydraulic Cement: GUb type in accordance with CAN/CSA-A3001.

.3 Cementitious Additions: GUb containing at least 8% in silica fumes in accordance with CSA A3001.

.4 Water: Complying to CSA A23.1/A23.2.

.5 Fine Aggregate: of normal density in accordance with CSAA 23.1/ A23.2 Article 4.2.3. It may be either natural sand or manufactured sand with a proportion of at least 20% natural sand.

.6 Coarse Aggregate: At normal density in accordance with CSA-A23.1/A23.2 Clause 4.2.3, particles shall be clean, durable, and free from dust and deleterious materials. The particle size shall be of 20 mm maximum, unless otherwise specified. A maximum size of 13 mm may also be used, with the approval of the PCA Representative, in certain difficult casting locations. Coarse aggregates should be of normal density. The quantity of flat and elongated particles shall be in accordance with Table 12 of the CSA-A23.1/A23.2 standard.

2.3 DOSAGE FORMULAS

.1 The Contractor shall submit the dosage forms for approval. No concrete can be poured without the dosage formula being approved.

.2 Prepare normal density concrete in accordance with CAN/CSA-A23.1 Section 4 and as specified in the structural drawings.

.3 In its plastic state, the concrete mixture shall conform to the following requirements:

.1 Uniformity.

.2 Handling and pumpability.

.3 Workability: concrete that is free of: surface stains, mortar loss, color variations and segregation.

.4 Finishing Suitability: 2% Maximum Penetrant and must be absorbed within 24 hours.

.5 Setting Time: Normal.

PART 3 EXECUTION

3.1 PREPARATION

.1 Obtain written authorization from the PCA Representative prior to pouring concrete.

.1 Give at least 24 hours' notice before concrete work begins.

.2 Also notify the test laboratory designated by the PCA Representative at least 24 hours in advance of such work.

.2 Place reinforcement as per "03 20 00 - Concrete Reinforcing".

.3 Before pouring concrete, obtain authorization from the PCA Representative as to the proposed method of protecting concrete during pouring and curing in inclement weather.

.4 Protect existing structures from soiling.

.5 Clean concrete surfaces and remove stains before applying finishing products.

.6 Maintain a concrete work record accurately showing the date and location of each batch, truck numbers, concrete characteristics, ambient temperature and samples taken.

.7 No loads shall be applied to new concrete components until authorized by the PCA Representative.

.8 Scrupulously respect the requirements of poured concrete against existing or hardened concrete.

.9 It is prohibited to pour concrete in rain or snow unless the PCA Representative, satisfied with the arrangements made to shelter the concrete during transport and placement, has given permission.

.10 The authorization granted by the PCA Representative to pour concrete when the outside temperature is below 5°C or above 25°C in no way releases the Specialized Contractor from full responsibility for the strength and durability of the concrete to be poured.

3.2 PLACING

.1 Place and execute cast-in-place concrete structures in accordance with CSA A23.1/A23.2.

.2 If difficulties arise during placement, modify the concrete formula as directed by the laboratory and use the admixture(s) prescribed by the laboratory; assume all costs.

.3 Finishing.

.1 Finish concrete surfaces in accordance with CSA A23.1/A23.2.

.2 Use methods reviewed to the satisfaction of the PCA Representative or methods defined in CSA Standard A23.1/A23.2 to remove excess bleeding water. Make sure not to damage the surfaces of the concrete elements.

.3 Unless otherwise specified, brush finish (monolithic trowel finish and stiff broom brushed).

.4 Unless otherwise specified, rub visible sharp edges with a piece of carborundum to a radius of at least 3 mm.

3.3 CONCRETE CURING

.1 Have the proposed cure method approved by the PCA Representative at least 24 hours in advance.

.2 Unless otherwise specified, the use of curing agents is prohibited.

.3 When outdoor temperature exceeds 27°C, keep forms wet before concrete is poured and for the time they remain in place.

.4 Ensure that, throughout the cure, the concrete will not be subjected to any overload and will be adequately protected against violent shocks, excessive vibration, bad weather and other disturbances.

.5 The supply, installation and maintenance of all temporary works and equipment required for the curing and protection of concrete in hot or cold weather, as well as the power supply of such equipment, are part of the contract work and their costs are covered by the Contractor.

.6 All tools required for curing and protection of concrete shall be readily available and ready for use before concrete placement begins.

.7 Where concrete has set sufficiently, exposed surfaces shall be kept continuously moist for at least seven consecutive days after pouring. The water used for curing must be clean and free of any material that may stain or discolor the concrete.

3.4 SLABS ON GROUND

.1 Verify that the embankments on which the slabs will be poured have been compacted and levelled to the satisfaction of the PCA Representative, and that they are clean and contain no traces of reworked soil. If the work is done in cold weather, ensure that the backfill is not frozen.

.2 Moisten backfill before placing concrete; in doing so, avoid puddles and muddy or soft areas.

.3 Before pouring concrete, spread geotextile membranes over backfill if it is clean stone.

.4 Welded wire mesh and any other reinforcement required in the slabs shall not be placed directly on the backfill to be raised and supported on the liquid concrete during placement.

.5 Increase slab thickness as required to allow at least 40 mm of concrete to be covered above and below electrical ducts.

.6 Floor slabs shall be installed in panels, the longest side of which shall not exceed 4.0 meters for exterior slabs. The ratio between length and width must not exceed 1.5. The location of these construction joints must be approved by the PCA Representative. At least 24 hours must elapse before concreting a new panel between existing panels.

.7 As an alternative, the Contractor may make control joints with a saw, respecting the requirements stated for construction joints.

3.5 EXECUTION TOLERANCES

.1 Execution tolerances for concrete surfaces shall comply to CSA A23.1 standard, using the straight edge method.

3.6 CONCRETING IN HOT WEATHER

.1 Where the outside temperature is greater than or equal to 25 degrees C or is expected to be greater than or equal to 24 hours, the temperature of the concrete at the time of pour shall be less than 25 degrees Celsius.

.2 Take necessary measures to avoid overheating of thick concrete elements during the first three (3) days after pouring.

3.7 COLD WEATHER CONCRETING

.1 Provide shelter heating to meet the guidelines in this section and the requirements of CSA A23.1/A23.2 standard.

.2 Maintain a minimum temperature of 10°C for a minimum period of seven (7) consecutive days following concreting.

.1 Extend the protection period until the concrete has reached 70% of the required compressive strength after twenty-eight (28) days.

.3 After the protection period, gradually lower concrete temperature for the first twenty-four (24) hours.

.1 The rate of temperature decrease shall not exceed 10°C/hour.

.2 Do not bring concrete into contact with outside air if the temperature difference between concrete and outside air is greater than 20°C.

.4 Concrete curing requirements apply regardless of the type of protection put in place.

.5 Parts of the work constructed with frozen concrete are considered defective and shall be redone according to plans and specifications at the Contractor's expense.

.6 The use of sodium chloride or calcium chloride as a de-icing agent is prohibited.

.7 In the case of open-air concreting, heat all surfaces (existing concrete, reinforcement, formwork, etc.) with which the concrete comes into contact beforehand to a minimum temperature of 5°C.

.8 In the case of concreting under shelter, heat and maintain contact surfaces at a temperature between 5°C and 20°C for at least 24 hours prior to concreting.

.9 Maintain formwork in place for the duration of protection and maintain form surfaces at a temperature between 10°C and 20°C for the duration of protection.

.10 Types of protection.

.1 Insulation.

.1 Use insulating material to cover concrete surface.

.1 Each layer of insulating material shall be of the waterproof cover type made from closed cell foam sheet and have a RSI thermal resistance of 0.40.

.2 The day prior to concreting, have the number of layers of insulation material to be installed approved by the PCA Representative.

.1 Depending on the temperature evolution of the concrete during the protection period, the PCA Representative may require the number of layers to be reduced or increased; removal or addition of one layer shall be completed within three (3) hours of the PCA Representative's request.

.3 Ensure that insulation is installed in a manner that will prevent exposure of concrete surfaces to outdoor air for the duration of protection.

.4 Insulating cover joints shall have an overlap of at least 75 mm.

3.8 ON-SITE QUALITY CONTROL

.1 Perform the field tests listed below in accordance with Section "01 45 00 - Quality Control" and submit the results as described in Section "01 33 00 - Documents/Samples to be Submitted", Section 1.3.

.1 Concrete batches.

.2 Slumping.

.3 Air Content.

.4 Compressive strength at 7 and 28 days.

.5 Ambient and concrete temperatures.

.2 Inspection and testing of the concrete and its components shall be performed by the testing laboratory designated by the PCA Representative, in order to meet satisfaction of and in accordance with CSA Standard A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Tests of suitability for faster stripping or any other tests performed at the Contractor's request shall be paid for by the Contractor.

.4 The Laboratory is the PCA Representative for all matters relating to concrete dosage and placement, and as such has the authority to issue instructions to which the Contractor and its concrete supplier shall comply.

.5 Cooperate with Laboratory personnel so that, during each pour, it can closely monitor the placement of concrete and take the samples required for the control tests.

.6 Provide a weather-proof area on site where concrete cylinders can be stored at an ambient temperature of not less than 10°C and not more than 25°C prior to shipment to the Testing Laboratory.

.7 For every 50 m^3 of concrete placed, the Laboratory shall take samples, with which it shall mold four (4) standard cylinders to be used for strength tests at the age of 7 and 28 days. The Laboratory, however, shall never take less than one (1) sample per day of the concrete of each class placed, for each type of structural element performed.

.8 Ensure that test results are provided to the PCA Representative and the test laboratory representative for review during the pre-placement meeting.

.9 The PCA Representative will bear the cost of testing in accordance with Section 01 29 83 Payment Testing Laboratory Services.

.10 The laboratory representative will collect additional specimens during cold weather concreting work. The cure of these test tubes must be done on site, under the same conditions as the concrete batches from which they are extracted.

.11 Non-destructive testing of concrete shall be performed in accordance with the methods described in CSA A23.1/A23.2 – at 3, 7, 14, and 28 days.

.12 Inspection and testing by the Laboratory Representative or the PCA Representative shall neither replace nor supplement the Contractor's quality control nor relieve the Contractor of its contractual responsibilities in this regard.

.13 Where testing or inspections by the testing laboratory reveal that the work does not conform to the requirements of the contract, the Contractor shall pay for such additional testing as may be requested by the PCA Representative to verify the acceptability of the corrections made.

END OF SECTION

Aggregates materials

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 1.1 CONDITIONS

.1 All terms and conditions, general instructions, supplementary specific instructions and addenda are an integral part of this section.

.2 This section and related drawings should be read and reviewed jointly with the sections and drawings describing complementary works, prior to or related to the work described.

1.2 RELATED SECTIONS

.1 All Division 01 - General Requirements and 02 - Existing Conditions sections.

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

.3 Section 32 11 23 – Aggregate base course

.4 Section 32 12 16 – Asphalt paving.

1.3 REFERENCE STANDARDS

.1 Ministère des Transports, Mobilité durable et Électrification des transports du Québec.

.1 MTMDET – Cahier des charges et devis généraux (CCDG 2018).

.2 Bureau de normalisation du Québec.

.1 NQ 2560-114 : Travaux de génie civil - Granulats.

1.4 DOCUMENTS/SAMPLES TO BE SUBMITTED FOR APPROVAL/INFORMATION

.1 The required documents and samples must be submitted in accordance with section "01 33 00 - Documents and Samples to be submitted".

.2 Technical data sheets.

.1 Required data sheets, manufacturer's instructions and documentation for aggregates must be submitted.

.3 Samples.

.1 One (1) sample per type of aggregate must be submitted.

.2 Continuous sampling of aggregates by the PCA Representative during production must be arranged.

.3 Designated Representative access to the supply source and prepared materials must be provided for sampling.

.4 Set up sampling stations at the exit of the aggregate conveyor for sampling by the designated Representative. Stop the conveyor at the Representative's request to allow him to take a sample through the transported material.

.5 Provide a front loader or other appropriate device and, if necessary, the services of an operator specialized in pile sampling. Move samples to storage as directed by the Representative.

.6 Provide new or clean sample bags/containers that are suitable for containing aggregate.

.7 The cost of sampling and testing aggregates must be payed if the first try does not meet the prescribed requirements.

.8 Provide the Representative's mobile laboratory with water, electricity and propane gas at the production site itself.

1.5 TRANSPORTATION, STORAGE AND HANDLING

.1 Transport, store and handle materials and equipment in accordance with Section 01 61 00 - General Product Requirements.

.2 Transport and Handling: aggregates transport and handle must be executed as to prevent segregation, contamination and degradation.

.3 Storage: Store washed or under water excavated material for at least 24 hours to allow water to drain freely and to ensure uniform moisture content.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Crushed stone type MG-20B or 20-0B commonly referred to as "municipal stone" is not acceptable.

.2 The classes of aggregates used shall correspond to the classes specified in the contract documents for each application. The granulometry, physical properties and other aggregates characteristics must comply with the requirements of 2101 MTMDET and NQ-2560-114 standards.

.3 Borrowed CG-14 :

.1 Sand approved by the PCA Representative from excavation or other sources and free from roots, stones greater than 75 mm in diameter, construction debris, slag, ash, turf, waste or other harmful materials.

.2 Granulometry according to the following table:

Screen opening dimensions (mm)	Passing % (according to MTQ-2010)
	CG-14
112 mm	N/A
31.5 mm	N/A
20 mm	100
14 mm	N/A
5 mm	35 - 100
1.25 mm	N/A
0.315 mm	N/A
0.160 mm	N/A
0.080 mm	0 – 10.0

Note: N/A not applicable means there are no requirements for the screen concerned.

.4 Borrowed MG-20 :

.1 Crushed stone or gravel composed of hard, strong, angular particles free of clay, organic or frozen materials and any other deleterious substance.

.2 The physical and mechanical properties of the aggregate of the lower and upper granular foundation shall meet the following requirements:

BNQ Standards	Granular foundation
Maximum petrographic number:	200
Durability MGS04 - percentage	20
Los Angeles – maximum percentage:	50
Micro-Deval – maximum percentage:	33
Fragmentation – minimum percentage:	100
Organic matter – maximum percentage:	0.8

.1 Los Angeles: "Aggregates: determination of abrasion resistance using the Los Angeles apparatus", the maximum is 32% instead of 50% in the case of crushed limestone.

.2 Fragmentation: percentage by mass of fragmented particles having at least one crushed fractured face and retained on the 5 mm sieve.

.3 Organic Matter; LC31-228 Test Standard.

.4 Materials shall not contain more than 3.5 % of particles finer than 0.02 mm.

.5 When tested according to ASTM C136-82 and ASTM C117-80 standards, the granulometry of materials after compaction shall remain within the following limits. The granulometric curve plotted on a semi-log diagram shall be continuous and not broken.

Screen opening dimensions (mm)	passing %
31.5 mm	100
20 mm	90-100
14 mm	68-93
5 mm	35-60
1.25 mm	14-38
0.315 mm	9-17
0.080 mm	2-7

.5 Borrowed MG-112 :

.1 Stone, gravel or crushed sand, all comers or sifted.

.2 The granulometry of the materials after compaction shall remain within the following limits and the granulometric curve drawn on a semi-logarithmic diagram shall be continuous and not broken:

Sieve	% passing
112 mm	100
20 mm	50-100
5.0 mm	12-70
0.080 mm	0-10

.6 20 mm net stone: crushed stone from quarries with a 20 mm caliber.

2.2 QUALITY CONTROL AT SOURCE

.1 Inform the Designated Representative of the proposed source of supply for aggregates and allow access for sampling at least four (4) weeks prior to the production start.

.2 If the materials from the proposed source of supply do not meet the prescribed requirements or cannot reasonably be prepared to meet them, find an alternative source of supply.

.3 Notify the Designated Representative at least four (4) weeks prior to any change in aggregate supply source.

.4 A material accepted at its source of supply may nevertheless be subsequently rejected if it does not meet the specified requirements, if the quality or properties of the material delivered are not uniform, or if its performance on site is unsatisfactory.

PART 3 EXECUTION

3.1 PREPARATION

.1 Aggregate Preparation.

.1 Prepare aggregates in a uniform manner, using methods that prevent contamination, segregation and degradation.

.2 Where required, a mixture of aggregates, including recycled materials that meet the physical requirements of the specification, is permitted to provide the prescribed particle size, shape or percentage of crushed particles.

.1 Use only methods and materials approved in writing by the Designated Representative.

.2 Stacking.

.1 Unless otherwise directed by the Designated Representative, pile aggregates on site where indicated. Do not pile aggregates on hard coated surfaces.

.2 Pile sufficient aggregate to meet work schedule.

.3 Aggregates shall be stockpiled on level and well-drained sites with sufficient bearing capacity and stability to support the stockpiled materials and handling equipment.

.4 To avoid aggregate mixtures, sufficiently space the different aggregate piles or separate them by means of strong, full height bulkheads.

.5 Mixed or contaminated materials shall not be used. Remove and dispose rejected material within 48 hours of rejection, as directed by the Designated Representative.

.6 It is prohibited to erect conical piles or to cause material to flow down either side of the piles.

.7 During winter work, prevent ice and snow from mixing with material.

3.2 CLEANING

.1 Cleaning during work: Perform cleaning work in accordance with the general and specific clauses of the contract.

.1 Leave the site clean at the end of each working day.

.2 Final Cleaning: Remove excess material/equipment, waste, tools and equipment from site.

.1 Clean area where aggregate has been piled. Leave a clean, well-drained soil, free of standing water accumulation.

.2 Evacuate unused aggregate from the job site.

.3 Waste management: sort waste for reuse and recycling.

.1 Remove bins and recycling bins from site and dispose of materials at appropriate facilities.

END OF SECTION

Excavating, trenching and backfilling

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 TERM AND CONDITIONS

.1 All terms and conditions, general and supplementary specific instructions and addenda are an integral part of this section.

.2 This section and related drawings should be read and reviewed jointly with the sections and drawings describing complementary works, prior to or related to the work described.

1.2 RELATED SECTIONS

.1 All sections of Divisions 01 - General Requirements and 02 - Existing Conditions.

.2 Section 31 05 16 - Aggregates materials

.3 All sections of Division 32 - Exterior Fittings.

1.3 REFERENCES

.1 Always refer to the most recent edition of the reference standards.

.2 American Society for Testing and Materials International (ASTM).

.1 ASTM C117-13, Standard Test Method for Material Finer than 0.075 mm (No. 200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C136-06, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D422-63 2002, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D698-12e2, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft3) (600 kN-m/m3).

.5 ASTM D1557-12e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft3) (2,700 kN-m/m3).

.6 ASTM D4318-10e1, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.3 Canadian General Standards Board (CGSB).

.7 CAN/CGSB 8.1-88, Sieves, Testing, Woven Wire, Inch Series.

.8 CAN/CGSB 8.2-88 Sieves, Testing, Woven Wire, Metric.

.4 U.S. Environmental Protection Agency (EPA)/Office of Water.

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

.5 MDDELCC – Procédures en cas de rejet d'eaux usées dans un cours d'eau.

.6 Ministère des Transports, Mobilité durable et Électrification des transports du Québec.

.1 MTMDET – Cahier des charges et devis généraux (CCDG 2018).

.7 Bureau de normalisation du Québec.

.1 BNQ-2560-114– Granulats.

.2 BNQ-2501-255 – Sols – Détermination de la relation teneur en eau-masse volumique - Essai avec énergie de compactage modifiée.

1.4 DEFINITIONS

.1 Excavation Classes: Two (2) classes of excavations are recognized, regular and rock excavations.

.1 Rock excavated materials: No rock excavations are planned. However, blocks larger than 1 cubic meter could be encountered during excavation work behind the existing wall to be repaired.

.2 Ordinary excavated material: all excavated material of any kind other than rock, including dense moraines (till), hardened material layers and frozen material.

.2 Unclassified debris: deposits of any kind found during the work.

.3 Topsoil.

.1 Any material suitable for promoting plant growth and which may be used as topsoil, for landscaping or for seeding.

.2 Any material reasonably free from subsoil material, clods of clay, brush, noxious weeds and other debris and free from pebbles, stumps, roots and other harmful materials greater than 25 mm.

.4 Waste Materials: Surplus materials or excavated materials not suitable for use in this work.

.5 Borrowed material: material from areas outside the grading area required for backfill or other parts of the structure.

.6 Recycled backfill materials: materials considered inert, from different sources and modified to meet the needs of backfill areas.

.7 Improper Materials.

.1 Compressible, chemically unstable and low strength materials.

.2 Frost Materials :

.1 Fine-grained soil with a plasticity index less than 10, as determined by ASTM D4318 standard, and particle size within the prescribed limits in ASTM C136 and ASTM D422 standards. The sieve designation shall conform to CAN/CGSB 8.2 standard.

.2 Table

Designation of sieves	% of sieves passage
2.00 mm	100
0.10 mm	45 - 100
0.02 mm	10 - 80
0.005 mm	0 - 45

.3 Coarse-grained soil with a 0,075 mm sieve passage percentage greater than 20 % by mass.

.8 Dimensionally stabilized fill materials: very weak mix of cement, concrete aggregate and water, which will not settle once placed in trenches to receive utility lines, and which can be excavated without prior preparation.

.9 The density of the backfill materials placed shall be measured compared to the maximum dry density established in the Modified Proctor test performed in accordance with ASTM D1557-78 standard.

1.5 CONTAMINATED MATERIALS MANAGEMENT

.1 Refer to section "01 35 13.43 - Special Procedures - Contaminated Sites" for the contaminated materials management.

1.6 LINES AND REFERENCE LEVELS, IMPLANTATION

.1 Place all necessary markers on the work site in order to delimit exactly in plan and elevation the excavations to be carried out and the embankments to be built.

.2 The Contractor shall, at its own expense, establish the profiles and alignments necessary for the work performance based on the benchmarks shown on the drawings or indicated by the PCA Representative.

.3 The Contractor is responsible for the implantation of the works. If the information on the plans is insufficient to locate the works, ask the PCA representative for the reference points to be used.

.4 The Contractor's surveyor shall be present on the site at all times and for the duration of the new underground and aboveground infrastructure implantation work. The implantation of the structures must be done using simple and verifiable methods on site and in such way that the PCA representative can validate the accuracy of the dimensions, levels and other markers using a tape measure.

.5 Provide required equipment, such as rules and templates, to facilitate the inspection work of the PCA Representative.

1.7 PROTECTION OF EXISTING STRUCTURES

.1 Underground Utility :

.1 Details of the dimensions, location and depth at which the specified utility are buried are for information purposes only and are not necessarily accurate or complete.

.2 Prior to the beginning of trenching and excavation work, notify the Designated Representative and the utility companies and determine the location and condition of underground structures. Clearly mark locations to avoid service interruptions.

.3 Confirm the location of underground structures by carefully conducting test excavations. In the event of a breakdown caused by the work, repair it immediately according to the instructions of the PCA Representative.

.4 Maintain and protect against damage water lines, sewer, gas lines, electrical lines, telephone lines and other identified structures. Cover the costs of this work.

.5 Obtain appropriate instructions from the PCA Representative before moving or removing a utility pipe or structure located in the excavation area.

.6 Note the location of preserved, diverted or abandoned underground pipelines.

.2 Above-ground Existing Buildings and Structures.

.1 In the presence of the PCA Representative, check the condition of buildings, trees and other plants, lawns, fences, utility poles, cables, railroad tracks, roadways, grade markers and benchmarks that may be damaged during construction.

.2 While work is being carried out, protect existing buildings and surface structures from damage. If necessary, make any necessary repairs to the satisfaction of the PCA Representative.

.3 If, during excavation work, it is necessary to cut roots or branches, carry out this work as prescribed by the PCA Representative.

.4 If it appears that the work may constitute a danger to existing buildings, or to adjacent structures and services, stop them and notify the PCA Representative. Thoroughly support the structures and only resume work after obtaining authorization from the PCA Representative.

.5 If deemed necessary by the PCA Representative, install reinforcement and shoring and carry out any necessary rework to prevent movement or collapse of the structures. Failure to comply with this order shall be enforced by the PCA Representative and at the Contractor's expense.

.6 Assume responsibility for damage caused by weather, negligence, lack of coordination or care.

.3 Also refer to the other requirements of the notes on the plans and comply with them.

1.8 DOCUMENTS/SAMPLES TO BE SUBMITTED

.1 Quality Control.

.1 Submit the required documents and samples in accordance with section 01 33 00 Documents/Samples to be submitted.

.2 Submit a report on existing conditions if requested by the PCA Representative.

.3 Submit proposed dewatering methods to the PCA Representative for review.

.4 Notify the PCA Representative in writing at least seven (7) days prior to beginning of excavation work to ensure cross sections are established.

.5 Notify the PCA Representative in writing when the bottom of the excavation is reached.

.6 Submit inspection results and reports to the PCA Representative.

.2 Documents/samples to be submitted prior to work

.1 Before beginning work related to this section, submit a list of the main equipment and materials to be used.

.2 Submit records concerning the location of underground utility systems, which shall include the location plan of existing utility systems.

.3 Samples

.1 Submit required samples as required.

.2 At least 4 weeks prior to the beginning of work, the Contractor shall notify the PCA Representative and the laboratory of the supply source to which he intends to obtain the backfilling material and allow them to access it for sampling purposes.

1.9 QUALITY ASSURANCE

.1 Retain the services of a qualified engineer authorized to practice in the Province of Quebec, to design and inspect the shoring, strutting and underpinning structures used during construction work.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Sort waste for reuse, if applicable, in accordance with the requirements of section "01 35 13.43 - Special Procedures - Contaminated Sites".

.2 Transport excess aggregate or excavation material for reuse, if any, to a location designated by the PCA Representative.

1.11 EXISTING CONDITIONS

.1 Field Elements.

.1 In the presence of the PCA Representative, check the condition of structures, vegetation, fences, utility poles, cables, railway rails, road surfaces, boundary markers and benchmarks that may be affected by the work.

.2 During the execution of the work, protect the elements present on the ground against any damage. In the event of damage, immediately repair the affected components as directed by the Designated Representative.

.2 Presence of rock

.1 The Contractor shall consider the possible presence of deep rock on the canal side.

1.12 GEOTECHNICAL AND ENVIRONMENTAL CHARACTERIZATION STUDIES

.1 As part of this project, a geotechnical or environmental soil characterization study was conducted for the work (N/Ref: RAP-001-rév.1)

1.13 ACCESS ROAD AND MAINTENANCE OF PUBLIC ROADS

.1 Keep surrounding public roads clean and free of soil deposits caused by material transport. Trucks will be carefully loaded to prevent material spillage from vibrations caused by transportation or wind. Temporary access roads to the site will be kept clean and accessible throughout the construction period.

.2 Provide for the cleaning of surrounding roads as required to the satisfaction of the PCA Representative when soil deposits caused by the transport of materials become significant.

.3 The Contractor shall provide signaling plans for approval and shall provide all required signage for the safe completion of the work, for the entire duration of the work.

.4 At all times and throughout the duration of the work, keep all peripheral access roads accessible to traffic.

.5 See also "01 55 26 - Traffic Control" for traffic management requirements.

PART 2 PRODUCTS

2.1 MATERIALS

.1 All granular materials conform to the specifications in Section 31 05 16 "Landscaping Aggregates".

.2 Class "A" backfill: clean, hard and resistant sand as well as non-frosting and compactable crushed stone or gravel, that is free of shale, swelling potential materials (pyrite), clay and friable, organic or deleterious materials, in accordance with the requirements of BNQ 1809-114 standard.

.3 Class "B" Backfill: Compactable inorganic materials selected from excavation materials or elsewhere, unfrozen and free of stones greater than 150 mm in diameter, slag, ash, sod, topsoil, waste or other deleterious materials.

.4 Fill without shrinkage or dimensionally stabilized backfill material:

.1 Maximum compressive strength of 0.4 MPa after 28 days.

.2 Maximum Portland cement content 25 kg/m3, 40% fly ash as alternative material: according to CAN/CSA-A3000 type GU.

.3 Minimum resistance 0.07 MPa after 24 hours.

.4 Concrete Aggregates: According to CAN/CSA-A23.1/A23.2-04.

.5 Portland cement: GU type.

.6 Sagging: 160 to 200 mm.

.5 20 mm net stone: crushed stone from quarries and 20 mm caliber.

PART 3 EXECUTION

3.1 SEDIMENT EROSION CONTROL MEASURES

.1 Provide temporary means to control erosion and sediment deposition to prevent soil loss that may result from storm water runoff or wind erosion, and carry this soil to watercourses. These means must comply with the requirements of applicable codes, standards and regulations in force.

.2 Inspect, maintain and repair control facilities as necessary until permanent vegetation is well established.

.3 Remove means of control in a timely manner and rehabilitate and stabilize areas disturbed during the work.

3.2 PREPARATORY WORK

.1 Remove, within indicated limits, obstacles, snow and ice accumulated on the surfaces of the excavation area.

.2 Carefully cut pavements and sidewalks along the lines of the proposed excavation so that the surface breaks cleanly and evenly.

.3 Obtain all permits necessary for operations, including but not limited to waste disposal by burning or other means.

3.3 PREPARATION/PROTECTION

.1 Protect existing elements in accordance with contract document requirements.

.2 Keep excavations clean, free of stagnant water and loose soil.

.3 Where soil can vary significantly in volume due to fluctuations in moisture content, cover and protect to the satisfaction of the PCA Representative.

.4 Protect the natural and artificial elements that must remain in place.

.5 Protect utility lines that must remain in place.

.6 All paving or sidewalks shall be sawn to the edge of the excavation prior to the actual excavation work. It is not permitted to break a pavement, curb or sidewalk using the bucket of an excavating machine or other similar method.

3.4 STACKING

.1 Stack backfill materials at locations designated by the PCA Representative.

.2 Stack granular materials to prevent segregation.

.3 Protect backfill materials from contamination.

.4 Take appropriate erosion and sedimentation control measures to prevent sediment from migrating outside site boundaries to watercourses.

3.5 SHORING, STRUTS AND UNDERPINNING

.1 If required, support or brace excavations, install sheet pile, build temporary retaining walls and inject concrete to prevent slippage in accordance with the “Loi sur la santé et sécurité au travail" and applicable provincial and municipal regulations. Remove braces only when no longer required.

.2 Even if certain indications as to the location of certain temporary support structures are shown on the drawings, the Contractor shall not consider these indications as limiting and the Contractor shall provide for all required support (soils, structures and others) according to his work methods until the completion of the work.

.3 The Contractor shall prepare and maintain excavation slopes as required to ensure their stability at his own expense.

.4 Assume responsibility for any accidents and repair any damage caused by improperly executed shoring, bracing and underpinning work.

.5 Retain the services of a qualified professional engineer recognized in the Province of Quebec for the design and inspection of sheet piles and other temporary shoring, strutting and underpinning work required. The Contractor's engineer shall provide the supervisor with a written confirmation of the conformity of the shoring and strutting structures constructed.

.6 At least two (2) weeks prior to beginning of work, submit design documentation and associated technical data for verification.

.7 Design documents and associated technical data submitted shall bear the seal and signature of a qualified professional engineer recognized in the Province of Quebec.

.8 The Engineer designing the temporary works shall provide proof of professional liability insurance unless employed by the Contractor. In such case, the Contractor must provide proof that the work of his engineer is covered by his insurance policy.

.9 Protect slopes by appropriate methods and in accordance with the requirements of the “Loi sur la santé et sécurité au travail" and the requirements of the contract documents.

.10 Obtain the appropriate permit from the competent authorities if it is necessary to temporarily divert a watercourse.

.11 Construct temporary structures at depth, height and locations authorized by the appropriate authorities.

.12 Perform the following operations during backfilling.

.1 Unless otherwise directed by the PCA Representative, remove temporary sheet piles and shoring from excavations.

.2 Do not remove struts until backfill is level with struts.

.13 Perform the following operations once the infrastructure construction is complete.

.1 Remove shoring and strutting structures.

.2 Dispose of surplus material off site and carry out work required to restore the original stream regime.

3.6 EXCAVATIONS DRYING OR DEWATERING AND PREVENTION OF UPLIFT

.1 Keep excavations dry throughout work on the rear side of the wall.

.2 Remove snow from work areas and transport snow off site.

.3 Submit for review, to the PCA Representative, details of proposed methods for dewatering excavations or preventing uplift, such as diking, installing filter tips and shaving sheet piles.

.4 Retain the services of a qualified professional engineer recognized in the Province of Quebec, for the design of the groundwater lowering and the excavation of the dewatering system.

.5 Design documents and associated technical data submitted shall bear the seal and signature of a qualified professional engineer recognized in the Province of Quebec.

.6 The Contractor shall bear the cost of the design and construction of the excavation dewatering and groundwater lowering system.

.7 If there is a risk of debility or uplift, avoid excavating below the water table. To avoid pipes or excavations bottom lifting, lower the water table, cut the upper end of the sheet piles or use other appropriate means.

.8 Protect open excavations from flooding and possible runoff damage.

.9 The Contractor shall consider that possible groundwater seepage may occur during excavation work, primarily during the navigation season.

.10 Discharge water in accordance with Section 01 35 43 - Environmental Protection to authorized drainage areas and in a manner that poses no risk to public or private property or to any part of the work completed or in progress.

.1 Build and maintain drainage ditches and other temporary detours outside the excavation boundaries.

.11 Regardless of the drainage method (gravity or pumped), water collected shall not be discharged to municipal, provincial and/or existing watercourses or wetlands without the installation and proper operation of treatment to reduce contaminants below the concentrations permitted in municipal and provincial bylaws. In the event of a discharge to the pluvial network of the City and/or the ministère des Transport, de la Mobilité Durable et de l'Électrification des Transport, the Contractor shall obtain an official permit from the appropriate authority and provide a copy to the Ministry Representative.

.12 Provide and install flocculation ponds, settling ponds or other water treatment facilities to remove suspended solids or other objectionable matter from the water before discharge to a storm sewer, watercourse or drainage basin.

3.7 EXCAVATION

.1 It is understood that no special compensation shall be paid to the Contractor for the use of equipment necessary to break and excavate rock, if any, even if the nature of the work so requires. Also, no special compensation will be paid to the Contractor for excavation in moving sand, in hard ground, in layers of silt or thin strata of pebbles agglomerated with clay, in broken or loose shales, in cemented gravel or in any other material that may be encountered, such as for the extraction of large pebbles, frozen earth, etc.

.2 It is understood that no special compensation will be paid to the Contractor for snow removal work when required.

.3 Notify the Designated Official at least seven (7) days prior to the beginning of excavation work so that the Designated Official can establish the initial cross sections.

.4 Perform excavation work according to the dimensions, alignments, traces and levels indicated.

.5 During excavation work, remove any obstructions.

.6 Excavation work shall not alter, in any way, the load-bearing capacity of adjacent foundations.

.7 When excavating pipes and ducts, no more than 30 m of trench shall be excavated prior to the installation of the elements to be buried, and the length of unprotected unfilled trench shall not exceed 15 m at the end of any working day, unless authorized in writing by the PCA Representative.

.8 Excavated materials deposited in storage must be placed at a sufficient distance from the trench as directed by the Representative.

.9 Excavated materials deposited in storage shall be placed at a sufficient distance from the top of the existing wall toward the sections that have not yet been excavated, as directed by the Designated Representative.

.10 Do not move soil under branches of trees or shrubs that must remain in place.

.1 If excavation between roots is required, hand dig and cut roots with a sharp axe or saw.

.11 Limit work with construction equipment in the immediate vicinity of unfilled trenches.

.12 Dispose of improper or excess material off site at a location designated by the PCA Representative. For dry materials (paving, concrete, pipes, stumps, trees, shrubs, etc.), follow the descriptions in the Règlement sur les déchets solides (Q-2, r.14) and any other municipal or local regulations that may apply.

.13 Avoid obstructing runoff or natural watercourses. Ensure that rain water, snowmelt water, groundwater, sewage and water from any other source are controlled and evacuated on site to allow work to be carried out.

.14 Excavation bottoms shall be level and consist of undisturbed soil, free from organic matter and loose or non-resistant substances, snow or ice.

.15 Inform the PCA Representative when the level intended as the bottom of the excavation is reached.

.16 Completed excavations must be approved by the PCA Representative.

.17 Clear the trench bottom of all improper material, including material below the required level, to the extent and to the depth determined by the PCA Representative.

.18 Hand profile excavations, firm up the slopes and remove all loose material and debris.

.19 If the bottom material has been disturbed, compact it to a density at least equal to that of the unstirred soil.

.20 Excavate and transport off-site disused utility network buried in the ground identified on plans, as well as debris from old foundations, disused sheet piles, concrete blocks, railway rails, tanks, etc. existing in the ground.

.21 Take precautions to remove dust.

.22 Where applicable, install geotextiles in accordance with manufacturer's requirements.

.23 Comply with all specific archaeological monitoring requirements established by the PCA Representative. In the event that archaeological monitoring is not required for the work and an archaeological remnant (construction or development remnant, object and object fragment) is discovered by chance during excavations, the contractor must suspend the work in the immediate area of the discovery and notify the PCA Representative, who will then take the necessary measures to protect and conserve the archaeological remnant. Meanwhile, work must continue in another sector.

3.8 BACKFILL AND COMPACTION MATERIALS

.1 Use backfill materials of the type indicated or prescribed in the drawings. The densities obtained by compaction are percentages of maximum densities calculated according to the standard ASTM D1557.

3.9 ENVIRONMENTAL PROTECTION MEASURES

.1 Refer to and comply with sections "01 35 13.43 - Special Procedures - Contaminated Sites".

.2 The objectives of protection measures are to control and contain sediment within the site, protect slopes and heaps from erosion, promote natural water infiltration and control runoff during and after construction.

.1 Soil protection measures against air and hydraulic erosion.

.2 Construction site surfaces shall be covered with a stable material such as grass, gravel, or geotextile membrane.

.3 Keep at a minimum the supply of loose material such as sand, soil, gravel or other material. Materials stocked in piles of more than 2.0 m in height shall be protected against erosion by cloths or membranes.

.4 In dry weather, water to create a dust suppressant.

.3 Protection measures against the release of sediment into the drainage system or the environment

.1 Surfaces must be sloped towards the inside of the job site so that runoff water does not wash material towards the outside of the job site.

.2 Install a geotextile membrane under the grids of the sumps that are affected by site operations.

.3 Install 20-56 mm clear stone path to promote wheel cleaning of construction vehicles and machinery.

.4 Install sediment barriers to protect surrounding areas.

.5 Site water runoff shall be filtered prior to evacuation.

.6 If necessary, clean surrounding streets with a mechanical broom.

.4 Maintenance Activities

.1 Periodically inspect and clean job site after each rain or snow period.

.2 Maintain entrances in good condition to prevent traces or deposits of sediment on public roads. On paths, depending on site conditions, add or replace 20-56 mm clean stone.

.3 Clean up sediment that has fallen or been left on public roads.

3.10 BACKFILLING

.1 Do not backfill before:

.1 Inspection and approval by the Designated Representative.

.2 Inspection, testing, approval and recording of underground utility networks.

.3 Removal of Concrete Forms.

.4 Removal of shoring and strutting structures; backfilling of voids with acceptable soil.

.2 Areas to be backfilled shall be free of debris, snow, ice, water and frozen ground.

.3 Backfill material that is frozen or contains snow, ice or debris shall not be used.

.4 Use backfill materials of the type specified or prescribed below. The densities obtained by compaction are percentages of maximum densities calculated according to the standard BNQ-2501-255.

.1 Excavation materials may be reused as backfill under the infrastructure when approved by the Designated Representative.

.2 Backfill materials shall be spread in uniform horizontal layers, not exceeding 300 mm in thickness before compaction, and densified to a minimum of 90% of the maximum dry density obtained in the modified Proctor test according to BNQ-2501-255. If necessary, the Contractor must moisten or dry the backfill layers in order to obtain the desired degree of compaction.

.3 If the natural ground or a layer of already compacted material undergoes, before the end of the work, subsidence, deterioration or loss of compactness due to the circulation of equipment, bad weather, the action of freezing and thawing or any other

cause, the Contractor shall resume such work, at his expense, including the off-site disposal of the affected materials if applicable.

3.11 SITE RESTORATION

.1 Once work is completed, remove waste and debris, level slopes and correct defects as directed by the PCA Representative.

.2 Replace topsoil as directed by the PCA Representative.

.3 Reconstruct or restore pavement surfaces and decks affected by the work to the level and condition they were in prior to the beginning of the work, ensuring that the original thickness of the work is maintained.

.4 Clean and rehabilitate areas affected by the work, as directed by the PCA Representative.

.5 Protect newly graded areas from erosion, prevent from traffic and keep free of waste or debris.

3.12 ON-SITE QUALITY CONTROL

.1 Where tests or inspections by the testing laboratory reveal that the works or materials do not conform to the requirements of the Contract, the Contractor shall bear the cost of such additional tests as may be requested by the PCA Representative to verify the acceptability of the corrections made. The same shall apply to the tests required to check the materials in place after correction.

END OF SECTION

Granular sub-base layer

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 CONDITIONS

.1 All terms and conditions, general instructions and supplementary specific instructions and addenda are an integral part of this section.

.2 This section and related drawings should be read and reviewed in conjunction with the sections and drawings describing additional works, prior to or related to the work described.

1.2 RELATED SECTIONS

.1 All sections of Divisions 01 - General Requirements and 02 - Existing Conditions.

.2 Section 31 05 16 - Aggregates.materials

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

1.3 REFERENCES

.1 Bureau de normalisation du Québec

.1 BNQ 2560-114/2014 - Aggregates.

.2 BNQ 2560-600/2002 - Aggregates - Recycled Materials Made from Concrete Residues, Bituminous Asphalt and Brick - Classification and Characteristics.

.3 BNQ-2501-255/2013 - Soils - Determination of water content-density mass relationship - Test with modified compaction energy.

.2 Ministère des Transports, de Mobilité durable et de l'Électrification des transports (formerly MTQ) :

.1 Road Standards - Volume VII: Materials.

.2 General Specifications and Specifications (CCDG).

.3 LC Test Method Compendium: Asphalt Sector.

.3 Canadian General Standards Board (CGSB or CGSB)

.1 CAN/CGSB-8.1-88, Wire Cloth Test Sieves, Non-Metric.

.2 CAN/CGSB-8.2-M88, Metric Wire Cloth Test Sieves.

1.4 TRANSPORT, STORAGE AND HANDLING

.1 Transport, store and handle materials and equipment in accordance with section 01 61 00 - General Product Requirements.

.2 Storage and handling

.1 Pile at least 50% of all required aggregates before commencing operations.

Granular sub-base layer

Issued for tender 2018-11-09

PART 2 PRODUCTS

2.1 MATERIALS

.1 Stone, gravel or sand or any aggregate conforming to the requirements of section 31 05 16 - Aggregates for landscaping works.

.2 Granular sub-base materials for trails shall conform to the following requirements:

Type of materials	Thickness (mm)	Compaction (%)
MG-112	300	95 % minimum

.3 The granular materials MG-112 can be replace with a recycle material grade MR-1 to MR-5 in conformity with the BNQ 2560-600 standard complying with the MG-112 granulometry.

PART 3 EXECUTION

3.1 PLACING

.1 Place the granular base layer materials once the sub-base layer has been inspected and approved by the PCA Representative.

.2 Place backfill materials along the structure to be backfilled once approved by the PCA Representative.

.3 Ensure no frozen material is placed.

.4 Place materials on a clean, unfrozen surface free from snow and ice.

.5 Place material using methods which do not lead to segregation or degradation of aggregate..

.6 Place material to full width in uniform layers not exceeding 300 mm compacted thickness. The PCA Representative may allow thicker layers to be placed if specified compaction can be achieved.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace any portion of a layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compaction equipment shall be equipped with a device that records hours of actual work and not motor running hours.

.3 Compact up to at least 95% according to BNQ-2501-255 standard.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted base layer.

.5 Apply water as necessary during compaction to obtain the specified density. If the soil is too wet, aerate it by scarifying it with appropriate equipment until the water content has returned to normal.

.6 Where compaction equipment, also known as rolling equipment, cannot be used, compact the materials to the prescribed density using mechanical tampers approved by the PCA Representative.

.7 Correct surface irregularities by loosening and adding or removing material until the surface is within specified tolerance.

3.3 SITE TOLERANCES

.1 Finished base to be within 10 mm of elevation as indicated but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished base layer in condition conforming to this section until succeeding base is constructed or the work is accepted by the PCA Representative.

END OF SECTION

Aggregate base course

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 CONDITIONS

.1 All terms and conditions, general instructions and supplementary specific instructions and addenda are an integral part of this section.

.2 This section and related drawings should be read and reviewed in conjunction with the sections and drawings describing additional works, prior to or related to the work described.

1.2 RELATED SECTIONS

.1 All sections of Divisions 01 - General Requirements and 02 - Existing Conditions.

.2 Section 31 05 16 – Aggregates materials

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

1.3 REFERENCES

.1 Bureau de normalisation du Québec.

.1 BNQ 2560-114/2014 - Aggregates.

.2 BNQ 2560-600/2002 - Aggregates - Recycled Materials Made from Concrete Residues, Bituminous Asphalt and Brick - Classification and Characteristics.

.3 BNQ-2501-255/2013 - Soils - Determination of water content-density mass relationship - Test with modified compaction energy.

.2 Ministry of Transport, Sustainable Mobility and Electrification of Transport (formerly MTQ).

.1 Road Standards - Volume VII: Materials.

.2 General Specifications and Specifications (CCDG).

.3 LC Test Method Compendium: Asphalt Sector.

.3 Canadian General Standards Board (CGSB or CGSB).

.1 CAN/CGSB-8.1-88, Wire Cloth Test Sieves, Non-Metric.

.2 CAN/CGSB-8.2-M88, Metric Wire Cloth Test Sieves.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials and equipment in accordance with section 01 61 00 - General Product Requirements.

.2 Storage and Handling Requirements.

.1 Stockp minimum 50% of total aggregate required prior to beginning operation.

Aggregate base course

Issued for tender 2018-11-09

PART 2 PRODUCTS

2.1 MATERIALS

.1 Stone, gravel or sand or any aggregate conforming to the requirements of section 31 05 16 - Aggregates for landscaping works.

.2 Trail granular base layer materials shall conform to the following requirements:

Type of materials	Thickness (mm)	Compaction (%)
MG-20	150	95 % minimum

PART 3 EXECUTION

3.1 PLACING

.1 Place the granular base after the sub-base has been inspected and approved by the PCA Representative.

.2 Place backfill materials along the structure to be backfilled once approved by the PCA Representative.

.3 Ensure no frozen material is placed.

.4 Place materials on a clean, unfrozen surface free from snow and ice.

.5 Place material using methods which do not lead to segregation or degradation of aggregate.

.6 Place material to full width in uniform layers not exceeding 300 mm compacted thickness. The PCA Representative may allow thicker layers to be placed if specified compaction can be achieved.

.7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.8 Remove and replace any portion of a layer in which material has become segregated during spreading.

3.2 COMPACTION

.1 Compaction equipment to be capable of obtaining required material densities.

.2 Compaction equipment shall be equipped with a device that records in hours of actual work and not motor running hours.

.3 Compact up to at least 95% according to BNQ-2501-255 standard.

.4 Shape and roll alternately to obtain smooth, even and uniformly compacted base layer.

.5 Apply water as necessary during compaction to obtain the specified density. If the soil is too wet, aerate it by scarifying it with appropriate equipment until the water content has returned to normal.

.6 Where compaction equipment, also known as rolling equipment, cannot be used, compact the materials to the prescribed density using mechanical tampers approved by the PCA Representative.

.7 Correct surface irregularities by loosening and adding or removing material until the surface is within specified tolerance.

3.3 SITE TOLERANCES

.1 Finished base to be within 10 mm of elevation as indicated but not uniformly high or low.

3.4 PROTECTION

.1 Maintain finished base layer in condition conforming to this section until succeeding base is constructed or the work is accepted by the PCA Representative.

END OF SECTION

Asphalt paving

Issued for tender 2018-11-09

PART 1 GENERAL

1.1 CONDITIONS

.1 All terms and conditions, general instructions, supplementary specific instructions and addenda are an integral part of this section.

.2 This section and related drawings should be read and reviewed jointly with the sections and drawings describing complementary works, prior to or related to the work described.

1.2 RELATED SECTIONS

.1 Section 31 05 16 – Aggregates materials.

1.3 REFERENCE STANDARDS

.1 Ministère des Transports, Mobilité durable et Électrification des transports du Québec.

.1 MTMDET - Cahier des charges et devis généraux (CCDG 2018

.2 Bureau de normalisation du Québec.

.1 NQ 2560-114 : Travaux de génie civil - Granulats.

.2 BNQ 2560-600– Granulats – Matériaux recyclés fabriqués à partir de résidus de béton, d'enrobés bitumineux et de briques – Classification et caractéristiques.

.3 BNQ-2501-255– Sols - Détermination de la relation teneur en eau-masse volumique - Essai avec énergie de compactage modifiée.

1.4 SAMPLES

.1 At least two (2) weeks prior to beginning work, notify the PCA Representative of the proposed source of supply for aggregates and allow access for sampling purposes.

.2 At least two (2) weeks prior to beginning work, submit all prescribed asphalt mix data sheets for review and comment.

1.5 DOSAGE FORMULA

.1 At least one (1) week prior to beginning work, submit the asphalt concrete mixture dosage formula and test results to the PCA Representative for approval.

1.6 DELIVERY AND STORAGE

.1 Transport the mixture to the site in clean vehicles free of foreign substances.

.2 Ensure that materials are continuously delivered in covered vehicles.

PART 2 PRODUCTS

2.1 MATERIALS

.1 The materials for the pavement structure shall meet these specifications:

Type of materials	Thickness (mm)	Compaction (%)
EC-10, PG 58-28	50	98

.1 Asphalt mix in conformity with the requirements of MTMDET Standard 4202;

.2 Bitumen in conformity with the requirements of MTMDET Standard 4101

2.2 EQUIPMENT

.1 Pavers: Use a self-powered pavers with automatic level control that can spread the mixture along the specified lines, slope and crown and within the prescribed tolerance limits. Hydraulic extensions on the spreader are not allowed unless they are equipped with augers, heating plates and vibrators. The augers must be within 0.5 m of the outer edge of the extension.

.2 Rollers: use a sufficient number of compactors of the appropriate type and weight to obtain a compacted mixture at the prescribed density.

.3 Vibratory rollers

.1 Drum diameter: at least 1200 mm.

.2 Amplitude of vibration (machine setting): 0.5 mm maximum for layers less than 40 mm thick.

.4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:

.1 Tippers with waterproof metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded

.3 In cool weather or for long hauls, insulate entire contact area of each truck box

.4 Use only trucks which can be weighed in single operation on scales supplied

.5 Hand tools.

.1 Lutes or rakes with covered teeth for spreading and finishing operations.

.2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm² for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by , may be used instead of tamping irons.

.3 Use 4.5 m long rulers to check the level of the finished surface.

.6 On-site test laboratory: provide the necessary space to set up a laboratory on site for the exclusive use of the PCA Representative to perform tests, maintain records and prepare reports.

2.3 MIXING DOSAGE FORMULA

.1 The dosage formula for the mixture must be approved in writing by the PCA Representative.

.2 The dosage formula shall be developed by a test laboratory approved in writing by the PCA Representative.

PART 3 EXECUTION

3.1 PREPARATION OF THE SURFACES

.1 Before spreading operations, clean and clear pavements of loose or foreign substances.

3.2 TRANSPORT OF THE MIX

.1 Transport mix to job site in vehicles cleaned of foreign material.

.2 Paint or spray truck beds with limewater, soap or detergent solution, or non petroleum based commercial product, at least daily or as required.

.1 Raise truck bed and thoroughly drain, and ensure no excess solution remains in truck bed.

.3 Unless PCA Representative allows artificial lighting, schedule delivery so that materials are placed in daylight.

.4 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.

.5 Deliver loads continuously in covered vehicles and immediately spread and compact.

.1 Deliver and place mixes at temperature within prescription range, but not less than [135] degrees C.

3.3 PLACING

.1 Obtain PCA Representative approval of base prior to placing asphalt.

.2 Place asphalt concrete to thicknesses, grades and lines as indicated or as directed by the PCA Representative.

.3 Place asphalt mixtures only when air temperature is 5 degrees C minimum.

.4 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.

.5 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.6 Apply asphalt concrete in layers of the following thicknesses after compaction (see plans):

.1 Multi-purpose track: single layer of 50 mm minimum.

3.4 COMPACTION

.1 Roll the asphalt continuously until a density of at least 98% of the volumic mass of the Marshall test sample taken from the mixture used is obtained. The joints shall be compacted to a minimum of 96% of the density of the Marshall test sample taken from the mixture used.

3.5 JOINTS

.1 General information :

.1 Raising the vertical face to provide a straight surface and profile on which a new coating will be applied. Remove any non-adherent substances.

.2 All cold joints, with temperatures below 80 °C, longitudinal and transverse, shall be heated before asphalt concrete is poured using an infrared heater. Heating equipment must be installed on the spreader and designed for this type of work. The equipment must heat the joints between 80°C and 120°C. The equipment must be approved by the PCA Representative.

.3 Overlap 100 mm on the previous laid strip by the spreader.

.4 Remove any excess material from the surface of the previous strip. Do not place excess material on the surface of the freshly laid strip.

.2 Transverse joints :

.1 Thoroughly make and compact the transverse joints to obtain a uniform wearing course.

.2 Cut the existing coating to its full thickness to obtain a vertical face.

3.6 FINISHING TOLERANCE

.1 Each layer shall have a uniform texture, a closed surface, without segregation and bleeding, be regular and conform to the prescribed transverse and longitudinal profiles.

.2 After the final turning of each layer, the PCA Representative checks the alignments and slopes. The finished surface of bituminous pavements must comply with a permissible deviation of 5 mm from the expected level, but without uniformly high or low deviations. Any irregularity or depression exceeding 5 mm in 4.5 m must be corrected. The thickness of each layer must not vary by more than 5 mm from the average thickness specified by the paving rate per square meter; the latter is transformed into thickness using the average gross density obtained when measuring compactness.

.3 These irregularities shall be verified using a 4.5 m rule that the Contractor shall have at all times at the work site.

3.7 DEFECTIVE STRUCTURES

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.

.1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 The Contractor shall repair, at its own expense, areas showing signs of segregation or rippling.

.3 All segregated surfaces are considered defective and shall be repaired at the Contractor's expense.

.4 The Contractor shall correct, at its own expense, non-compliant level deviations in accordance with section 3.8 of the asphalt concrete surface and areas that retain water on the surface.

.5 Adjust the turning and level operations of the spreader to prevent ripples and cracks in the coating.

.6 The specifications concerning the physical characteristics mentioned in this quotation shall be met during production. Pavements whose mixture does not meet the requirements of sections 3.1.4, 3.6.1 and the percentage of voids will be considered defective and therefore refused, unpaid and must be replaced by asphalt conforming to the specifications, at the Contractor's expense.

3.8 QUALITY CONTROL

.1 Control by the Contractor

.2 The Contractor shall provide, at its own expense, test results for at least one asphalt sample produced. The sample must be taken in conjunction with the laboratory. A complete analysis must be performed on this sample.

.3 The briquettes (4) must be made manually at the site by applying 50 blows / face and without heating the asphalt concrete samples.

3.9 RESUMED

.1 Any paving considered by the PCA Representative to be unsuccessful (joints, mixes, laying, profiles, etc.) shall be taken back by the Contractor to the satisfaction of the PCA Representative without any additional charge.

3.10 MACHINERY

.1 The PCA Representative reserves the right to require the replacement or modification of any part of machinery that it deems inadequate. Provide the appropriate machinery for the operations described in the plans and specifications in order to obtain top quality structures.

3.11 CLEANING

.1 Leave the premises clean at the end of each work day.

END OF SECTION

Parcs Canada Parks Canada

ELECTRICAL ENGINEERING SECTION – ISSUED FOR TENDER

Securing of multi-use pathway of Lachine Canal national historic site, Montreal

APPROACHES TO SIR GEORGES-ETIENNE-CARTIER FOOTBRIDGE

Parks Canada Agency

November 09, 2018

Canada

Seals and signatures page

Issued for tender

PARKS CANADA

Multi-use pathway of Lachine Canal National Historic Site

Approaches Sir George-Etienne-Cartier footbridge

TECHNICAL SPECIFICATIONS - ELECTRICITY

FOLDER : 653793

DATE : November 9, 2018

Prepared by: Raynald St-Pierre 2018-11-07
Raynald St-Pierre, Tech.

Approved by:
INGÉNIEUR
Miguel Angel Hurtado Giles
5032005
QUÉBEC
Miguel Hurtado, Eng.

Common work results for electrical

Issued for tender 2018-11-09

1. GENERAL

1.1 Related requirements

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 74 00 - Cleaning.

1.2 References

.1 Definitions:

.1 Electrical and electronic terms: unless otherwise specified or indicated, terms used in these specifications, and on drawings, are those defined by IEEE SP1122.

.2 Reference Standards:

.1 CSA Group

.1 CSA C22.1, Canadian Electrical Code, Part 1 (last Edition), Safety Standard for Electrical Installations.

.2 CSA C22.10, Quebec construction code, Chapter V, Electricity Canadian electrical code, Part 1 (21st edition) with Quebec amendments.

.3 CAN/CSA-C22.3 No.1, Overhead Systems.

.4 CAN3-C235, Preferred Voltage Levels for AC Systems, 0 to 50,000 V.

.2 Institute of Electrical and Electronics (IEEE)/National Electrical Safety Code Product Line (NESC)

.1 IEEE SP1122-2000, The Authoritative Dictionary of IEEE Standards Terms, 7th Edition.

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 concrete bases, lampposts, boxes, fuses, fuses holders, conduits, wiring as well as protective devices and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop drawings:

.1 Submit drawings of concrete bases and poles stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

.2 The transmission detail of shop drawings will defined to the start-up meeting.

.3 If changes are required, notify Parks Canada Representative of these changes before they are made.

.4 Certificates:

.1 Provide CSA certified material.

.2 Where CSA certified material is not available, submit such material to inspection authorities for approval before delivery to site.

.3 Submit electrotechnical test results of installed electrical systems

.4 Permits and fees: in accordance with General Conditions of contract.

1.4 Closeout Submittals

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data.

.1 Provide for each system and principal item of equipment as specified in technical sections for use by operation and maintenance personnel.

2. PRODUCTS

2.1 Design Requirements

.1 Operating voltages: to CAN3-C235.

.2 Motors, electric heating, control and distribution devices and equipment to operate satisfactorily at 60 Hz within normal operating limits established by above standard.

.1 Equipment to operate in extreme operating conditions established in above standard without damage to equipment.

2.2 Wiring Identification

.1 Identify wiring with permanent indelible identifying markings, numbered, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour coding: to CSA C22.1.

3. EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for cables installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Parks Canada Representative.

.2 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Parks Canada Representative.

3.2 Installation

.1 Do complete installation in accordance with CSA C22.1 except where specified otherwise.

.2 Do overhead and underground systems in accordance with CAN/CSA-C22.3 No.1 except where specified otherwise.

3.3 Field Quality Control

.1 Perform the following electrotechnical tests in presence of the Parks Canada Representative:

.1 Insulation resistance testing and splices: the luminaires must be disconnected from base of post. A voltage of 1 000 V is applied between the distribution cables and the ground, as well as between the cables themselves, and the value of the resistance must be at least 100 megohms. Results less than 100 megohms require circuit check.

.2 To be perform only on new conductors installed before making connections with existing conductors.

3.4 System Startup

.1 Instruct operating personnel in operation, care and maintenance of systems, system equipment and components.

.2 Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with aspects of its care and operation.

3.5 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Wire and box connectors (0 – 1,000 V)

Issued for tender 2018-11-09

1. GENERAL

1.1 Related Requirements

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

1.2 References

.1 CSA Group

.1 CAN/CSA-C22.2 No.18, Outlet Boxes, Conduit Boxes and Fittings.

.2 CAN/CSA-C22.2 No.65, Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE-03).

.2 National Electrical Manufacturers Association (NEMA).

1.3 Action and Informational Submittals

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 Closeout Submittals

.1 Submit the required documents/elements.

1.5 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect wire and box connectors.

.3 Replace defective or damaged materials with new.

2. PRODUCTS

2.1 Materials

.1 Pressure type splicing connectors for conductors AWG 8 and larger: using uninsulated solderless compression connections, Burndy type, KPA and QA-B models, or equivalent, and covered with rubber splicing tape conforming to standards for this type of splice.

.2 Fixture type splicing connectors, Elastimold type, for roadway lighting with current carrying parts of copper sized to fit copper conductors 10 AWG or less.

3. EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for wire and box connectors installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Parks Canada Representative.

.2 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Parks Canada Representative.

3.2 Installation

.1 Remove insulation carefully from ends of conductors cables and:

.1 Install mechanical pressure type connectors and tighten screws with appropriate compression tool recommended by manufacturer. Installation shall meet secureness tests in accordance with CAN/CSA-C22.2 No.65.

.2 Install fixture type connectors and tighten to CAN/CSA-C22.2 No.65. Replace insulating cap.

3.3 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

Wires and cables
(0 – 1,000 V)

Issued for tender

2018-11-09

1. GENERAL

1.1 Related Requirements

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

1.2 References

.1 CSA Group

.1 CAN/CSA-C22.2 No.0.3, Test methods for electrical wires and cables.

.2 CAN/CSA-C22.2 No.65, Wire Connectors (Tri-National Standard with UL 486A-486B and NMX-J-543-ANCE-03).

1.3 Product Data

.1 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect wire and box connectors.

.3 Replace defective or damaged materials with new.

2. PRODUCTS

2.1 Wires

.1 Conductors: stranded for 10 AWG and larger. Minimum size: 12 AWG.

.2 Copper conductors: size as indicated, with 600 V insulation of cross-linked thermosetting polyethylene material rated RWU90 XLPE.

3. EXECUTION

3.1 Field Quality Control

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform wires tests using method appropriate to site conditions and to approval of Parks Canada Representative and local authority having jurisdiction over installation.

.3 Perform tests before energizing electrical system.

3.2 General Cable Installation

.1 Install cable in trenches.

.2 Terminate cables in accordance with Section 26 05 20-Wire and Box Connectors- (0-1000V).

.3 Cable Colour Coding: to Section 26 05 00 - Common Work Results for Electrical.

.4 Lace or clip groups of feeder cables at distribution centres, pull boxes, and termination points.

3.3 Installation of Wires

.1 Install wiring as follows:

.1 In conduit systems in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings.

.2 In underground ducts in accordance with Section 33 65 76 – Direct buried underground cable ducts.

.3 In surface in accordance with Section 26 05 34 – Conduits, conduit fastenings and conduit fittings.

END OF SECTION

Splitters, junction, pull boxes and cabinet

Issued for tender 2018-11-09

1. GENERAL

1.1 Related Requirements

.1 Section 26 05 00 - Electrical - Common Work Results for Electrical

1.2 References

.1 CSA Group

.1 CSA C22.1, Canadian Electrical Code, Part 1, last Edition.

1.3 Action and Informational Submittals

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

2. PRODUCTS

2.1 Ground Pull Boxes or Junction Boxes

.1 The pull box or junction box consists of a concrete box and cover. It is used to facilitate pulling electrical cables for future connections. The Contractor must comply with manufacturer's installation instructions to prevent the box from moving once installed.

.2 The box cover must be engraved with the indications listed on the plans. The engraving must be carried out in-plant by the manufacturer.

3. EXECUTION

3.1 Ground Pull Boxes or Junction Boxes Installation

.1 Install pull boxes or junction boxes according to manufacturer's installation instruction.

END OF SECTION

Conduits, conduit fastenings and conduit fittings

Issued for tender 2018-11-09

1. GENERAL

1.1 Related Requirements

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

1.2 References

.1 CSA Group

.1 CAN/CSA C22.2 No. 18, Outlet Boxes, Conduit Boxes, Fittings and Associated Hardware, A National Standard of Canada.

.2 CSA C22.2 No. 211.2, Rigid PVC (Unplasticized) Conduit.

1.3 Action and Informational Submittals

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

.2 Product data: submit manufacturer's printed product literature, specifications and datasheets.

.1 Submit conduit manufacturing data.

.3 Quality assurance submittals:

.1 Test reports: submit certified test reports.

.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.3 Instructions: submit manufacturer's installation instructions.

2. PRODUCTS

2.1 Conduits

.1 Rigid PVC conduit: to CSA C22.2 No. 211.2.

2.2 Conduit Fastenings

.1 One hole steel straps to secure surface conduits 50 mm and smaller.

.1 Two hole steel straps for conduits larger than 50 mm.

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits at 1.5 m on centre.

.4 Threaded rods, 6 mm diameter, to support suspended channels.

2.3 Conduit Fittings

.1 Ensure factory "ells" where 90 degrees bends for 25 mm and larger conduits.

.2 Watertight connectors and couplings for EMT.

.1 Set-screws are not acceptable.

2.4 Fish Cord

.1 Polypropylene.

3. EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Installation

.1 Use rigid PVC conduit underground.

.2 Install fish cord in empty conduits.

.3 Dry conduits out before installing wire.

3.3 Conduits Underground

.1 Slope conduits to provide drainage.

.2 Waterproof joints (PVC excepted) with heavy coat of bituminous paint.

3.4 Cleaning

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

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Installation of cables in trenches and in ducts

Issued for tender 2018-11-09

1. GENERAL

1.1 Related Requirements

.1 Section 26 05 00 - Electrical - Common Work Results for Electrical.

.2 Section 33 65 76 - Electrical - Direct Buried Underground Cable Ducts.

1.2 References

.1 Insulated Cable Engineers Association, Inc. (ICEA).

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 cables and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect cables from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

2. PRODUCTS

Not used.

3. EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for cable installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Parks Canada Representative.

.2 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Parks Canada Representative.

3.2 Cable Installation in Ducts

.1 Install cables as indicated in ducts.

.2 Do not pull spliced cables inside ducts.

.3 Install multiple cables in duct simultaneously.

.4 Use CSA approved lubricants of type compatible with cable jacket to reduce pulling tension.

.5 To facilitate matching of colour coded multiconductor control cables reel off in same direction during installation.

.6 Before pulling cable into ducts and until cables are properly terminated, seal ends of lead covered cables with wiping solder; seal ends of non-leaded cables with moisture seal tape.

.7 After installation of cables, seal duct ends with duct sealing compound.

3.3 Field Quality Control

.1 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

.2 Perform tests using qualified personnel.

.1 Include necessary instruments and equipment.

.3 Check phase rotation and identify each phase conductor of each feeder.

.4 Check each feeder for continuity, short circuits and grounds.

.1 Ensure resistance to ground of circuits is not less than 50 megohms.

.5 Pre-acceptance tests:

.1 After installing cable but before splicing and terminating, perform insulation resistance test with 500 V megger on each phase conductor.

.2 Check insulation resistance after each splice and/or termination to ensure that cable system is ready for acceptance testing.

.6 Provide Parks Canada Representative with list of test results showing location at which each test was made, circuit tested and result of each test.

.7 Remove and replace entire length of cable if cable fails to meet any of test criteria.

3.4 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.5 Protection

.1 Repair damage to adjacent materials caused by cables installation.

END OF SECTION

Roadway lighting

Issued for tender 2018-11-09

1. GENERAL

1.1 Related Requirements

.1 Section 26 05 00 - Electrical – Common Work Results for Electrical.

1.2 References

.1 CSA Group

.1 CSA C22.2 No.206-13(C2013), Lighting Poles.

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 roadway lighting and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect roadway lighting from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

2. PRODUCTS

2.1 Aluminium Poles

.1 Round extruded aluminum pole with a wall 0.219 in. (5.6 mm) thick, with welds at upper and lower portions of the footing. The pole must have the following characteristics:

.1 Mounting on concrete anchor base.

.2 Two-section square base cover in folded aluminum.

.3 Round pole with two (2) banner holders for installation of banner.

.4 Access handhole above pole base for wiring connections, with welded-on reinforcing frames and bolted-on cover.

.5 Anchor bolts: steel with shims, nuts and covers.

.6 Every second lamp post must be equipped with an anti-theft device for wiring.

.7 Anchor bolts shall have a cover.

.8 Textured black colour and compliant with AAMA 2603. Application of thermosetting polyester paint, minimum 4 mils/100 microns with a tolerance of ± 1 mils/24 microns.

.9 Ground lugs for 6 AWG wires located at access door height.

.10 Oblong holes for the pole's base shall accept a bolt circle varying from 235 mm (9.3 in.) to 279 mm (11 in.).

.11 Counterweight system to eliminate resonance frequency.

.12 All poles shall be able to support wind loads as per the following:

.1 Resist 100 km/h winds with 140 km/h gust wind.

2.2 Luminaires

.1 General characteristics:

.1 Luminaire with aluminium cast housing, LED light strip, weatherproof (IP66), black. Opening and closing system to access components shall be without tools.

.2 Luminaire shall be cUL (or CSA) approved and dark-sky compliant and have undergone 3G vibration testing as per CALTrans 611 vibration testing, GR-63 CORE 4.4.1/5.4.2 Earthquake zone 4, or ANSI C136.31-2001. Test reports shall be available upon request.

.3 Fixture must be equipped with overvoltage protection in compliance with standard IEEE / ANSI C62.41.2, and listed for test procedures LM-79 and LM-80.

.4 Minimum warranty of ten (10) years for all components and all manufacturing and operating defects as well as a minimum 10-year warranty on corrosion-, ultraviolet- and abrasive-resistant luminaire finish.

.5 All hardware shall be made of stainless steel.

.6 Factory pre-wired luminaires with integral regulator.

.7 Luminaires types are described below.

.2 LED fixture:

.1 Number of LED's: 32.

.2 Voltage: 240 VAC.

.3 Dimensions: 470 mm diameter x 787 mm high.

.4 Lamp: LED from Philips Lumec, power according to the models shown in plans, 700 mA, 3,000°K colour temperature, 0-10 V driver, minimum 70 colour rendering index (CRI) and minimum 61,000-hour service life at 700 mA.

.5 Distribution: distribution types, as indicated in plans. The luminaires models are described in plans.

.6 Power supply: 240 VAC, plug-in type, LED power supply and driver circuit, class 1 with power factor greater than 90%, harmonic distortion rate (THD) less than 20% at full load. Circuit protected by 10 kV overvoltage suppressor in compliance with IEEE/ANSI C62.41.2. The regulator must be able to start at temperatures up to at least 40°C.

.7 Color: black.

.8 Option: fuse and control 0-10V.

3. EXECUTION

3.1 Examination

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for roadway lighting installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Parks Canada Representative.

.2 Inform Parks Canada Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.2 Installation

.1 Install poles true and plumb in accordance with manufacturer's instructions.

.2 Install luminaires on pole.

.3 Check luminaire orientation, level and tilt.

.4 Connect luminaire to existing lighting circuit and control circuit.

.5 Perform tests in accordance with Section 26 05 00 - Common Work Results for Electrical.

3.3 Cleaning

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

**Direct buried underground
Cable ducts**

Issued for tender 2018-11-09

1. GENERAL

1.1 Related Requirements

.1 Section 26 05 00 - Electrical - Common Work Results for Electrical

.2 Section 26 05 43.01 - Electrical - Installation of Cables in Trenches and in Ducts.

.3 Section 31 23 33.01 – Excavating, trenching and backfilling (See Technical Specifications - Civil).

1.2 References

.1 CSA Group

.1 CSA C22.2 No. 211.0.

1.3 Action and Informational Submittals

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 Delivery, Storage and Handling

.1 Deliver, store and handle materials in accordance with Section with manufacturer's written instructions.

2. PRODUCTS

2.1 PVC Ducts and Fittings

.1 Rigid PVC duct: Type ES2-rigid, with moulded fittings, for direct burial expanded flange ends, Trade size 6.

.1 Nominal length: 3 m plus or minus 12 mm.

.2 Rigid PVC split ducts.

.3 Rigid PVC bends, couplings, reducers, bell end fittings, plugs, caps, adaptors same product material as duct, to make a complete installation.

.4 Rigid PVC 90 degrees, 45 degrees bends as required.

2.2 Solvent Weld Compound

.1 Solvent cement for PVC duct joints.

2.3 Cable Pulling Equipment

.1 6 mm stranded nylon pull rope tensile strength 5 kN.

2.4 Warning Tape

.1 Standard 4-mil polyethylene 76 mm wide tape, yellow with black letters, imprinted with "**CAUTION BURIED ELECTRIC CABLE BELOW** ".

3. EXECUTION

3.1 Manufacturer's Instructions

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 Installation

.1 Install duct in accordance with manufacturer's instructions and at elevations as indicated.

.2 Clean inside of ducts before laying.

.3 Slope ducts with 1 to 400minimum slope.

.4 Install plugs and cap both ends of ducts to prevent entrance of foreign materials during and after construction.

.5 Pull through each duct steel mandrel not less than 300 mm long and of diameter 6 mm less than internal diameter of duct, followed by stiff bristle brush to remove sand, earth and other foreign material.

.1 Pull stiff bristle brush through each duct immediately before pulling-in cables.

.6 Install a pull rope continuous throughout each duct run with 2 m spare rope at each end.

.7 Place continuous strip of warning tape 300 mm above duct before backfilling trenches.

.8 Notify the Parks Canada Representative for field review upon completion of direct buried ducts and obtain acceptance prior to backfill.

3.3 Cleaning

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

.2 Remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

Parcs Canada Parks Canada

ANNEXES SECTION – ISSUED FOR TENDER

Securing of multi-use pathway of Lachine Canal national historic site, Montreal

APPROACHES TO SIR GEORGES-ETIENNE-CARTIER FOOTBRIDGE

Parks Canada Agency

November 09, 2018

Canada

SNC·LAVALIN

Étude géotechnique

Sécurisation de la piste polyvalente du canal Lachine
Montréal (Québec)

LEMAY

Environnement et géosciences

06 | 07 | 2018

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SNC-Lavalin GEM Québec inc.
3420, boul. Saint-Joseph Est
Montréal (Québec) Canada H1X 1W6
514.331.6910 514.255.1400

Étude géotechnique

Sécurisation de la piste polyvalente du canal Lachine
Montréal (Québec)

LEMAY
3500, rue Saint-Jacques
Montréal (Québec) H4C 1H2

Damien Grellet, ing. jr, M. Sc.
Chargé de projet
N° de membre de l'OIQ : 5072215

André Contant, ing., M. Sc. A.
Directeur de projet
N° de membre de l'OIQ : 43706

Robert Morin, géo., M. Sc. A.
Directeur de projet
N° de membre de l'OGQ : 268

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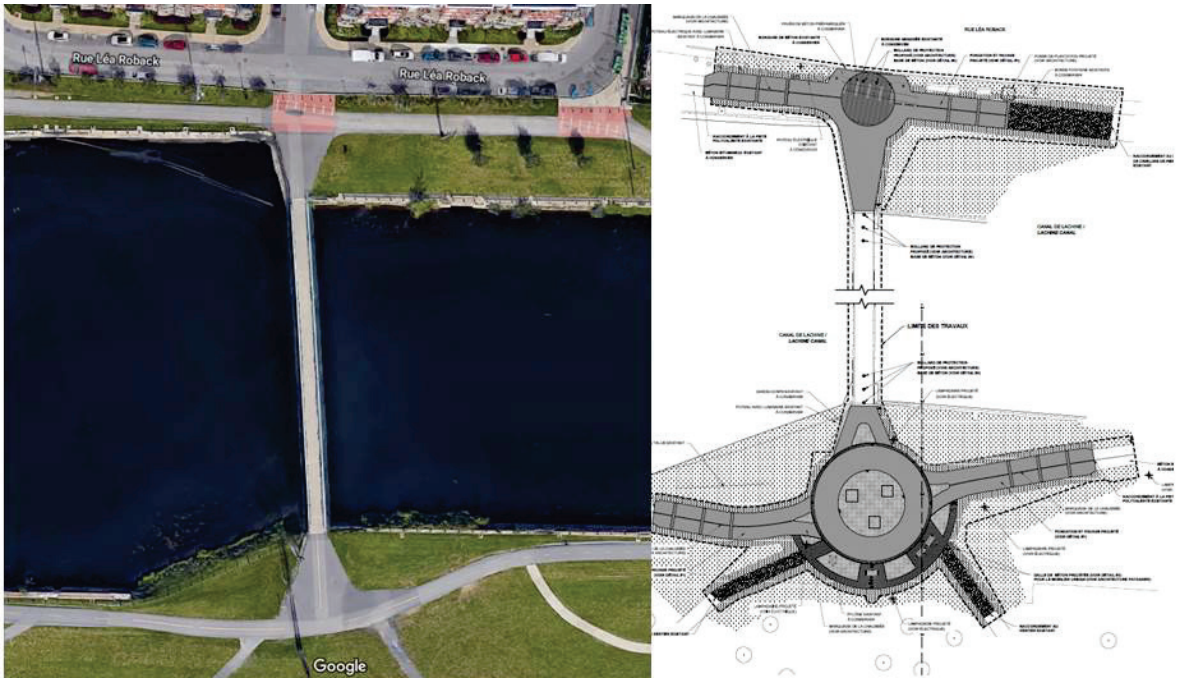
1 Introduction

Les services professionnels de SNC-Lavalin Environnement et géosciences (« SNC-Lavalin ») ont été retenus par Lemay pour effectuer une étude géotechnique dans le cadre de la sécurisation de la piste polyvalente du canal Lachine située à Montréal. Les secteurs à l'étude sont situés de part et d'autre de la passerelle George-Étienne Cartier, c'est à dire dans le parc de l'ancienne-cour-de-triage au sud de la passerelle et le long de la rue Léa Roback au nord. Selon l'information fournie, un réaménagement de ces deux secteurs est prévu afin de sécuriser la piste polyvalente. Les secteurs à l'étude ainsi que les aménagements prévus sont présentés à la figure 1.

Le but de l'étude géotechnique est de déterminer la nature et certaines propriétés des sols et matériaux en place, de donner les renseignements nécessaires à la conception des ouvrages projetés et de formuler des recommandations d'ordre géotechnique et environnemental pertinentes au projet.

Figure 1 Secteurs à l'étude de la piste polyvalente du canal Lachine (secteur George-Étienne Cartier)



2 Travaux réalisés

2.1 Travaux sur le terrain

Les travaux sur le site ont été effectués le 14 mai 2018. Le personnel de SNC-Lavalin a supervisé l'exécution de 3 forages, dont 2 implantés au sud de la passerelle George-Étienne Cartier et 1 au nord. Les forages ont été effectués dans la piste cyclable existante, mais également dans les zones gazonnées au droit du futur aménagement de la piste. La figure 2 montre la localisation des forages effectués sur le site dans le cadre du présent mandat. Le forage F-01-18 a été légèrement déplacé compte tenu de la présence de fils électriques aériens à proximité de la zone de forage. Une photographie de la localisation du forage F-01-18 déplacé est présentée à la figure 3. Pour le secteur sud, le forage F-02-18 a été effectué dans la zone gazonnée et le forage F-03-18 a été effectué au centre de la piste polyvalente.

Figure 2 Localisation des forages

Figure 3 Localisation du forage F-01-18

Les forages ont été effectués à l'aide d'une foreuse de marque CME, modèle 75, montée sur un camion. L'avancée des forages dans les sols en place a été effectuée par enfoncement successif de carottiers fendus. Le premier échantillon a été prélevé au moyen d'un échantillonneur de chaussée (échantillonneur PW) de 127 mm de diamètre intérieur et de 910 mm de longueur. Par la suite, un échantillon a été prélevé à l'aide d'un carottier fendu de calibre B ou N. Les carottiers B et N possèdent une longueur de 610 mm. L'échantillonnage des sols et matériaux a été poursuivi jusqu'à une profondeur de 1,52 mètre pour les 3 forages. Pour chaque forage, une description visuelle des sols et des matériaux a été effectuée en complément de leur échantillonnage.

Les rapports des forages F-01-18 à F-03-18 sont présentés à l'annexe 2.

Des échantillons de sols ont été prélevés à l'endroit de chacun de ces trois forages afin de permettre la réalisation d'analyses chimiques sur certains d'entre eux. Les procédures de nettoyage, d'échantillonnage et de conservation des échantillons du sol ont été réalisées par un technicien de SNC-Lavalin conformément aux recommandations du *Guide d'échantillonnage à des fins d'analyses environnementales* du Centre d'expertise en analyse environnementale du Québec (CEAEQ). Les échantillons prélevés dans l'échantillonneur de chaussée prévus pour analyses chimiques ont été prélevés au centre du carottier. Les équipements utilisés pour l'échantillonnage des sols (carottiers fendus de calibre B et N, truelle et bol en acier inoxydable, etc.) ont été nettoyés, avant chaque utilisation, à l'eau savonneuse et rincés successivement à l'eau purifiée, à l'acétone, à l'hexane, et de nouveau à l'acétone et à l'eau purifiée.

Les échantillons ont été gardés au frais dans des glacières jusqu'à leur entreposage dans des réfrigérateurs, avant d'être transportés au laboratoire de chimie analytique.

2.2 Travaux de laboratoire

2.2.1 Travaux de laboratoire pour les fins de l'étude de sécurisation de la piste

Tous les échantillons récupérés ont été transportés à notre laboratoire où ils ont été identifiés par un examen visuel. Afin de compléter l'identification et la description des sols et matériaux, plusieurs échantillons ont été soumis aux essais en laboratoire suivants :

› Analyses granulométriques : 5 essais.

Les résultats détaillés des essais d'analyse granulométrique sont présentés à l'annexe 3.

Les échantillons récupérés et non utilisés pour les essais géotechniques en laboratoire seront conservés pendant une période de trois mois suivant la date d'émission du présent rapport. Ils seront par la suite détruits à moins d'avis contraire écrit de Lemay.

2.2.2 Travaux de laboratoire à des fins de caractérisation environnementale

2.2.2.1 Sélection des échantillons pour analyses chimiques

Pour chaque forage, un échantillon dans les deux premières couches de remblai granulaire a été soumis à des analyses chimiques. Les sols jusqu'à 0,58 m, 0,91 m et 0,81 m de profondeur ont donc été soumis à des analyses chimiques pour les forages F-01-18, F-02-18 et F-03-18

respectivement. Tous les échantillons sélectionnés pour analyses chimiques sont identifiés sur les rapports de forage de l'annexe 2 (mention « AC »).

2.2.2.2 Programme analytique

Au total, 6 échantillons ont été sélectionnés pour analyses puis soumis au programme analytique décrit ci-après :

› Hydrocarbures pétroliers (C_{10} à C_{50});
› Métaux extractibles totaux (Al, Ag, As, Ba, Cd, Cr, Co, Cu, Sn, Mn, Mo, Ni, Pb, Se, Zn);
› Hydrocarbures aromatiques polycycliques (HAP).

Les analyses chimiques ont été effectuées en sous-traitance par Eurofins. Ce laboratoire de chimie analytique est accrédité par le MDDELCC pour l'ensemble du programme analytique retenu.

Les analyses chimiques ont été soumises au programme de contrôle de qualité interne d'Eurofins. Ce programme inclut, entre autres, des blancs de méthode, des duplicata, des contrôles certifiés et des ajouts dosés.

2.2.2.3 Échantillon de contrôle

L'échantillon de sols F-03-18/CF-1C a été prélevé en duplicata au chantier (DC-01). Le duplicata a été soumis aux mêmes analyses que celles effectuées sur l'échantillon correspondant.

3 Résultats de l'étude et recommandations

3.1 Volet chaussée

3.1.1 Nature et propriétés des sols et matériaux

Les rapports des forages F-01-18 à F-03-18 effectués dans le cadre de ce projet sont présentés à l'annexe 2. Les principales unités stratigraphiques rencontrées dans les forages sont décrites dans les paragraphes qui suivent.

Le tableau 1 présente une description des matériaux et des couches de sol observés dans les forages.

Tableau 1 Stratigraphie des sols

Forage n°	Stratigraphie des sols	
	Épaisseur (mm)	Description des sols et caractéristique
F-01-18	230	**Sol organique** puis gravier sableux, traces de silt
	250	**Remblai** de pierre concassée et de mâchefer
	210	**Remblai** de pierre concassée de calibre 20-0 mm (%F = 7,4 %)
	250	**Remblai** de silt sableux et graveleux (traces de bois et mâchefer) (%F = 49,5 %)
F-02-18	200	**Sol organique**
	210	**Remblai** de sable silteux, un peu de pierre concassée (traces de bois et de mâchefer)
	1 110	**Remblai** de sable et gravier concassé de calibre 20-0 mm (%F = 8,8 %)
F-03-18	50	**Enrobé bitumineux**
	450	**Fondation granulaire** de pierre concassée de calibre 20-0 mm (%F = 7,0 %)
	410	**Remblai** de sable graveleux et silteux de calibre 20-0 mm. Présence de mâchefer (%F = 20,8 %)
	610	**Remblai** de mâchefer, un peu de sable silteux et traces de pierre concassée
%F = pourcentage de particules fines		

Au nord de la passerelle (forage F-01-18) les sols en place sont constitués d'une couche de sol organique et de gravier sableux de 230 mm d'épaisseur puis de deux couches de remblai de pierre concassée sur une épaisseur totale de 460 mm. La première couche de remblai contient plus spécifiquement un mélange de pierre concassée et de résidus de mâchefer noir. La seconde couche de remblai est constituée de pierre concassée de calibre 20-0 mm. L'analyse granulométrique effectuée sur un échantillon prélevé dans cette seconde couche de remblai indique que ces matériaux ne satisfont pas aux exigences granulométriques pour un matériau MG 20 (NQ 2560-114/2014). La déficience par rapport à l'exigence se situe principalement au niveau du tamis 80 µm, où les résultats obtenus montrent un matériau contenant trop de particules fines en comparaison à une valeur admissible comprise entre 2,0 % et 7,0 % pour l'exigence de la norme NQ 2560–114/2014. Ce matériau satisfait toutefois les exigences

granulométriques d'un MG 112. Enfin, la couche de remblai en pierre concassée de calibre 20-0 mm repose sur un remblai de silt sableux et graveleux. Des traces de bois et de mâchefer ont été identifiées dans cette couche. Le forage F-01-18 a été arrêté à 1,52 m avant d'entièrement traverser ce remblai.

Au sud de la passerelle, le forage F-02-18 effectué dans l'accotement gazonné de la piste cyclable indique la présence d'une couche de sol organique sur une épaisseur de 200 mm puis d'une couche de remblai de 210 mm d'épaisseur de sable silteux. Des traces de bois et de mâchefer ont été identifiées dans cette couche de sol. À 410 mm de profondeur une couche de remblai de sable et gravier concassé de calibre 20-0 mm a été identifiée. L'analyse granulométrique effectuée sur un échantillon prélevé dans cette couche indique que ces matériaux ne satisfont pas aux exigences granulométriques pour un matériau MG 20 (NQ 2560-114/2014). La déficience par rapport à l'exigence se situe principalement au niveau du tamis 80 µm où les résultats obtenus montrent un matériau contenant trop de particules fines en comparaison à une valeur admissible comprise entre 2,0 % et 7,0 % pour l'exigence de la norme NQ 2560–114/2014. Ces matériaux satisfont cependant aux exigences granulométriques pour un matériau de sous-fondation MG 112 (NQ 2560-114/2014).

Le forage F-03-18, effectué au droit de la piste cyclable, indique la présence d'une couche d'enrobé bitumineux de 50 mm d'épaisseur en surface puis d'une fondation granulaire de pierre concassée de calibre 20-0 mm sur une épaisseur de 450 mm. L'analyse granulométrique effectuée sur un échantillon prélevé dans la fondation granulaire indique que ces matériaux satisfont aux exigences granulométriques pour un matériau MG 20 (NQ 2560-114/2014). La couche de fondation repose sur un remblai de sable graveleux et silteux de calibre 20-0 mm. L'analyse granulométrique effectuée sur un échantillon prélevé dans cette couche de remblai indique que ces matériaux ne satisfont pas aux exigences granulométriques pour un matériau MG 112 (NQ 2560-114/2014). La déficience par rapport à l'exigence se situe principalement au niveau du tamis 80 µm où les résultats obtenus montrent un matériau contenant trop de particules fines en comparaison à une valeur admissible de 10,0 % pour l'exigence de la norme NQ 2560-114/2014. Enfin, cette couche de remblai de 410 mm d'épaisseur repose sur une couche de remblai constitué de mâchefer noir et de sable silteux.

3.1.2 Trafic de conception

Notons qu'aucune donnée de trafic n'est disponible. Pour fins de dimensionnement, l'accès à la piste cyclable étant limité aux véhicules légers d'entretien, le trafic de conception devrait être d'au plus 50 000 ÉCAS (équivalent de charge axiale simple). Si ce trafic est sous-estimé, SNC-Lavalin devra en être avisée afin que soit révisées et validées les recommandations formulées ci-après.

3.1.3 Structure de chaussée recommandée

En considérant ce qui précède, nous recommandons d'utiliser la structure de chaussée présentée au tableau 2. Elle est tirée du chapitre 15 *Voies cyclables* du tome I des normes pour Ouvrages routiers du MTMDET et elle a une épaisseur totale similaire à celle observée au droit du forage F-03-18, effectué dans la piste cyclable actuelle.

Tableau 2 Structure de chaussée proposée

Élément de la chaussée	Matériau	Épaisseur (mm)
Revêtement bitumineux		
› Couche unique	EC-10 (PG 58-28)	50
Matériaux granulaire		
› Fondation	MG 20	150
› Sous-fondation	MG 112 / MR-1 à MR-5 correspondant à un MG 112	300
Épaisseur totale		500

D'un point de vue géotechnique, toute couche de sol contenant des matières organiques et tout sol organique présents sous le niveau prévu de l'infrastructure devront être enlevés de l'emprise de la future structure de chaussée jusqu'au terrain naturel inorganique sous-jacent.

La surface de l'infrastructure devra être aménagée de façon à favoriser le drainage des sols et à éviter les accumulations d'eau dans la fondation granulaire. Au niveau du fond de l'excavation, il est recommandé de compacter les sols pulvérulents en place à au moins 90 % de la masse volumique sèche maximale obtenue de l'essai Proctor modifié. Avant la mise en place de la structure de chaussée, l'infrastructure devra être soumise à une épreuve de portance telle que décrite dans le *Cahier des charges et devis général* (CCDG) du MTMDET. Toutes les zones molles ou flexibles détectées sur la surface d'infrastructure devront être excavées et remblayées par un matériau de même nature que le sol environnant adéquatement densifié. Essentiellement, il s'agit de constituer une base stable et homogène pour construire la structure de chaussée.

3.1.4 Réaménagement des secteurs au nord et au sud de la passerelle

Au nord de la passerelle, les non-conformités observées dans les matériaux de remblai en pierre concassée de calibre 20-0 mm ne devraient pas avoir d'impact significatif sur le comportement à long terme de la structure de chaussée. La réutilisation des matériaux est jugée acceptable d'un point de vue géotechnique et ces derniers pourront être conservés comme matériau de sous-fondation de la nouvelle structure de chaussée. Tel qu'indiqué précédemment, toutes les couches de sol contenant des matières organiques devront être excavées. Le secteur actuellement en gravier devra être excavé sur une épaisseur minimale de 200 mm afin de mettre en place une fondation granulaire MG 20 d'au moins 150 mm d'épaisseur avant la mise en œuvre de la couche d'enrobé bitumineux. Cette recommandation est valide au droit du forage F-01-18. Ailleurs, si un remblai granulaire n'est pas rencontré après l'enlèvement des sols organiques de surface, l'excavation devra se poursuivre sur une épaisseur de 500 mm pour mettre en place la structure de chaussée du tableau 2.

Au sud de la passerelle, la structure de chaussée actuellement en place sous la piste polyvalente pourra être conservée. Pour les secteurs actuellement gazonnés (accotement) situés au droit de la future piste polyvalente, l'ensemble des matériaux en place devront être excavés afin de mettre en œuvre la structure de chaussée présentée au tableau 2.

3.1.5 Considérations générales

Les enrobés bitumineux et la pierre concassée doivent respectivement satisfaire les exigences des devis normalisés suivants : 4VM-10 pour les enrobés à chaud et 6VM-9 pour les matériaux granulaires pour fondations, assise et remblai.

Si utilisés, les matériaux recyclés (MR) doivent être conformes à la norme 6VM-20.

3.2 Volet environnement

3.2.1 Critères et normes de référence

Les résultats des analyses chimiques réalisées sur les échantillons de sols sont présentés sur les certificats d'analyses inclus à l'annexe 5. Ils sont également présentés au tableau 4-1 de l'annexe 4, en comparaison avec les critères génériques A, B et C du *Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés* (Guide d'intervention), ainsi qu'avec les valeurs limites de l'annexe I du *Règlement sur l'enfouissement des sols contaminés* (RESC).

Les résultats ont également été comparés aux valeurs limites des annexes I et II du *Règlement sur le stockage et les centres de transfert de sols contaminés* (RSCTSC) et du *Règlement sur la protection et la réhabilitation des terrains* (RPRT). Il est important de noter que le RSCTSC et le RPRT adoptent généralement les critères B (annexe I) et C (annexe II) du Guide d'intervention comme valeurs limites réglementaires, bien qu'ils n'y réfèrent pas sous ce vocable. Ainsi, à moins d'indication contraire et pour faciliter la compréhension, l'expression « critères B et C » est conservée dans ce document pour désigner à la fois les critères génériques de la Politique et les valeurs indiquées aux annexes I et II du RPRT et du RSCTSC.

Il est également à noter que les valeurs du critère A utilisées pour l'interprétation des concentrations en métaux correspondent à celles suggérées pour la province géologique des Basses-Terres du St-Laurent.

3.2.2 Résumé des concentrations dans les sols

Les résultats d'analyses chimiques obtenus pour l'échantillon de gravier sableux prélevé dans la couche de surface dans le forage F-01-18/CF1A et pour l'échantillon prélevé dans la fondation granulaire du forage F-03-18/CF-1B indiquent des concentrations toutes inférieures au critère A.

Des concentrations en HP C_{10}-C_{50}, en métaux ou en HAP situées dans la plage B-C ont été mesurées dans 3 des 6 échantillons analysés (F-01-18/CF-1B/0.23-0.58m, F-02-18/CF-2/0.41-0.51m et F-03-18/CF-1C/0.50-0.81m).

Enfin, toutes les concentrations mesurées dans ce mandat sont inférieures au critère C.

3.2.3 Résultat des échantillons de contrôle

Les résultats du programme de contrôle de la qualité interne d'Eurofins sont présentés sur les certificats d'analyses inclus à l'annexe 5. Les résultats de ces contrôles sont rapportés conformes aux critères internes d'Eurofins, lesquels sont approuvés par le MDDELCC. De plus, les limites de détection rapportées sont inférieures ou égales au critère A pour tous les paramètres analysés.

Par ailleurs, les écarts relatifs ont été calculés entre les concentrations du duplicata de terrain et celles de l'échantillon correspondant, lorsqu'au moins 1 des 2 résultats est supérieur à 10 fois la limite de quantification méthodologique, afin d'évaluer la précision des résultats.

Plusieurs des écarts ainsi calculés sont supérieurs à la valeur limite de 30 % suggérée par le MDDELCC. Par conséquent, la précision des résultats est jugée faible et indique vraisemblablement une distribution très hétérogène des contaminants dans le remblai.

3.2.4 Conclusions et recommandations

3.2.4.1 Contexte réglementaire

Étant donné que le site à l'étude est constitué d'une chaussée, le Guide d'intervention de même que le RPRT indiquent que le seuil à partir duquel des travaux de réhabilitation pourraient être requis correspond au critère C (annexe II du RPRT).

Par ailleurs, il convient de noter que la gestion environnementale des sols contaminés excavés est encadrée par divers règlements, notamment le *Règlement sur le stockage et les centres de transfert de sols contaminés* (RSCTSC), le *Règlement sur l'enfouissement des sols contaminés* (RESC) et le *Règlement sur l'enfouissement et l'incinération de matières résiduelles* (REIMR).

3.2.4.2 Gestion des sols

Étant donné que toutes les concentrations mesurées dans ce mandat sont inférieures au critère C, aucun travail de réhabilitation n'apparaît requis sur le site à l'étude.

Les concentrations mesurées n'imposent aucune restriction quant à la réutilisation des sols excavés pour l'aménagement de la nouvelle structure de chaussée. Tel qu'indiqué à la section 3.1.4, d'un point de vue géotechnique, la réutilisation d'une partie des matériaux est également jugée acceptable. Les déblais ne pouvant pas être réutilisés pour l'aménagement du site devront être gérés hors site.

Compte tenu de l'examen de l'ensemble des résultats et de la distribution hétérogène des concentrations mesurées, il est recommandé de considérer que tous les déblais générés par le projet peuvent présenter des concentrations dans la plage B-C. D'après les indications présentées dans la Grille de gestion des sols excavés, à l'annexe 5 du *Guide d'intervention* et à titre d'exemple, les déblais dont les concentrations sont situées dans la plage B-C pourront être valorisés dans un lieu d'enfouissement technique (LET) autorisé par le MDDELCC. La Grille de gestion des sols excavés du *Guide d'intervention* est reproduite à l'annexe 7 du présent rapport.

Les informations recueillies dans la présente étude devraient permettre d'orienter, de façon préliminaire, les mesures de gestion environnementale des sols excavés. Toutefois, s'il s'avérait

requis de préciser la distribution des contaminants et les volumes de déblais contaminés à gérer pendant les travaux projetés, une caractérisation environnementale de site Phase I et une caractérisation environnementale des sols complémentaire serait recommandée. Enfin, si la présente étude a été effectuée en application de la *Loi sur la qualité de l'environnement*, en raison de concentrations supérieures au critère B mesurées dans les sols, la municipalité doit, dès qu'elle en est informée, requérir l'inscription d'un avis de contamination sur le registre foncier (article 31.48 de la LQE et article 1 du RPRT).

Il est à noter que la présence de mâchefer a été identifiée dans l'ensemble des forages et dans la majorité des couches de remblais. Compte tenu de la méthodologie utilisée pour le prélèvement des échantillons, la proportion de mâchefer n'a pas été déterminée avec précision et pourrait varier sur le site. Si la proportion de mâchefer s'avérait supérieure à 50 %, les matériaux excavés devront être considérés comme des matières résiduelles et des essais complémentaires devront être effectués sur ces matériaux afin de permettre la modification aux conclusions et recommandations de ce rapport en ce qui a trait à la gestion environnementale des déblais.

Enfin, il est entendu que seules les données directement recueillies à l'endroit des forages et à la date de l'échantillonnage sont exactes et que toute interpolation ou extrapolation de ces résultats à l'ensemble ou à une partie du site comporte des risques d'erreurs qui peuvent elles-mêmes influencer la nature et l'ampleur des actions requises sur le site. SNC-Lavalin devrait être avisée de la présence de tout indice de contamination perçu lors de la construction (odeurs, présence de matières résiduelles, etc.) qui n'aurait pas été perçu dans les forages effectués dans le cadre du présent mandat et qui pourrait entraîner un mode de gestion environnementale des sols excavés différent de celui recommandé dans le présent rapport.

Annexe 1

Portée du rapport

1. Utilisation du rapport

a. Utilisation du rapport

Le présent rapport a été préparé, et les travaux qui y sont mentionnés ont été réalisés par SNC-Lavalin GEM Québec inc. (SNC-Lavalin) exclusivement à l'intention du client (le Client) auquel le rapport est adressé, qui a pris part à l'élaboration de l'énoncé des travaux et en comprend les limites. La méthodologie, les conclusions, les recommandations et les résultats cités au présent rapport sont fondés uniquement sur l'énoncé des travaux et assujettis aux exigences en matière de temps et de budget, telles que décrites dans l'offre de services et/ou dans le contrat en vertu duquel le présent rapport a été émis. L'utilisation de ce rapport, le recours à ce dernier ou toute décision fondée sur son contenu par un tiers est la responsabilité exclusive de ce dernier. SNC-Lavalin n'est aucunement responsable de tout dommage subi par un tiers du fait de l'utilisation de ce rapport ou de toute décision fondée sur son contenu. Les conclusions, les recommandations et les résultats cités au présent rapport (i) ont été élaborés conformément au niveau de compétence normalement démontré par des professionnels exerçant des activités dans des conditions similaires de ce secteur, et (ii) sont déterminés selon le meilleur jugement de SNC-Lavalin en tenant compte de l'information disponible au moment de la préparation du présent rapport. Les services professionnels fournis au Client et les conclusions, les recommandations et les résultats cités au présent rapport ne font l'objet d'aucune autre garantie, explicite ou implicite. Les conclusions et les résultats cités au présent rapport sont valides uniquement à la date du rapport et peuvent être fondés, en partie, sur de l'information fournie par des tiers. En cas d'information inexacte, de la découverte de nouveaux renseignements ou de changements aux paramètres du projet, des modifications au présent rapport pourraient s'avérer nécessaires. Les résultats de cette étude ne constituent en aucune façon une garantie que le terrain à l'étude est exempt de toute contamination. Le présent rapport doit être considéré dans son ensemble, et ses sections ou ses parties ne doivent pas être vues ou comprises hors contexte. Si des différences venaient à se glisser entre la version préliminaire (ébauche) et la version définitive de ce rapport, cette dernière prévaudrait. Rien dans ce rapport n'est mentionné avec l'intention de fournir ou de constituer un avis juridique. Le contenu du présent rapport est de nature confidentielle et exclusive. Il est interdit à toute personne, autre que le Client, de reproduire ou de distribuer ce rapport, de l'utiliser ou de prendre une décision fondée sur son contenu, en tout ou en partie, sans la permission écrite expresse du Client et de SNC-Lavalin.

b. Modifications au projet

Les données factuelles, les interprétations et les recommandations contenues dans ce rapport ont trait au projet spécifique tel que décrit dans le rapport et ne s'appliquent à aucun autre projet ni autre site. Si le projet est modifié du point de vue conception, dimensionnement, emplacement ou niveau, SNC-Lavalin devra être consulté de façon à confirmer que les recommandations déjà données demeurent valides et applicables.

c. Nombre de sondages

Les recommandations données dans ce rapport n'ont pour but que de servir de guide à l'ingénieur en conception. Le nombre de sondages pour déterminer toutes les conditions souterraines qui peuvent affecter les travaux de construction (coûts, techniques, matériel, échéancier), devrait normalement être plus élevé que celui pour les besoins du dimensionnement. Le nombre de points d'échantillonnage et d'analyses chimiques ainsi que la fréquence d'échantillonnage et le choix des paramètres peuvent influencer la nature et l'envergure des actions correctives ainsi que les techniques et les coûts de traitement ou de disposition. Les entrepreneurs qui soumissionnent ou qui sous-traitent le travail, devraient compter sur leurs propres études ainsi que sur leurs propres interprétations des résultats factuels des sondages pour apprécier de quelle façon les conditions souterraines peuvent affecter leur travail et les coûts des travaux.

d. Interprétation des données, commentaires et recommandations

À moins d'avis contraire, l'interprétation des données et des résultats, les commentaires et les recommandations contenus dans ce rapport sont fondés, au mieux de notre connaissance, sur les politiques, les critères et les règlements environnementaux en vigueur à l'emplacement du projet et à la date de production du rapport. Si ces politiques, critères et règlements font l'objet de modifications après la soumission du rapport, SNC-Lavalin devra être consulté pour réviser les recommandations à la lumière de ces changements. Lorsqu'aucune politique, critère ou réglementation n'est disponible pour permettre l'interprétation des données et des résultats analytiques, les commentaires ou recommandations exprimés par SNC-Lavalin sont basés sur la meilleure connaissance possible des règles acceptées dans la pratique professionnelle. Les analyses, commentaires et recommandations contenus dans ce rapport sont fondés sur les données et observations recueillies sur le site, lesquelles proviennent de travaux d'échantillonnage effectués sur le site. Il est entendu que seules les données directement recueillies à l'endroit des sondages, des sites d'échantillonnage et à la date de l'échantillonnage sont exactes et que toute interpolation ou extrapolation de ces résultats à l'ensemble ou à une partie du site comporte des risques d'erreurs qui peuvent elles-mêmes influencer la nature et l'ampleur des actions requises sur le site.

2. Rapports de sondage et interprétation des conditions souterraines

a. Description des sols et du roc

Les descriptions des sols et du roc données dans ce rapport proviennent de méthodes de classification et d'identification communément acceptées et utilisées dans la pratique de la géotechnique. La classification et l'identification du sol et du roc font appel à un jugement. SNC-Lavalin ne garantit pas que les descriptions seront identiques en tout point à celles faites par un autre géotechnicien possédant les mêmes connaissances des règles de l'art en géotechnique, mais assure une exactitude seulement à ce qui est communément utilisé dans la pratique de la géotechnique.

b. Conditions des sols et du roc à l'emplacement des sondages

Les rapports de sondage ne fournissent que des conditions du sous-sol à l'emplacement des sondages seulement. Les limites entre les différentes couches sur les rapports de sondage sont souvent approximatives, correspondant plutôt à des zones de transition, et ont donc fait l'objet d'une interprétation. La précision avec laquelle les conditions souterraines sont indiquées, dépend de la méthode de sondage, de la fréquence et de la méthode d'échantillonnage ainsi que de l'uniformité du terrain rencontré. L'espacement entre les sondages, la fréquence d'échantillonnage et le type de sondage sont également le reflet de considérations budgétaires et de délais d'exécution qui sont hors du contrôle de SNC-Lavalin

c. Conditions des sols et du roc entre les sondages

Les formations de sol et de roc sont variables sur une plus ou moins grande étendue. Les conditions souterraines entre les sondages sont interpolées et peuvent varier de façon significative autant en plan qu'en profondeur des conditions rencontrées à l'endroit des sondages. SNC-Lavalin ne peut en effet garantir les résultats qu'à l'endroit des sondages effectués. Toute interprétation des conditions présentées entre les sondages comporte des risques. Ces interprétations peuvent conduire à la découverte de conditions différentes de celles qui étaient prévues. SNC-Lavalin ne peut être tenu responsable de la découverte de conditions de sol et de roc différentes de celles décrites ailleurs qu'à l'endroit des sondages effectués.

d. Niveaux de l'eau souterraine

Les niveaux de l'eau souterraine donnés dans ce rapport correspondent seulement à ceux observés à l'endroit et à la date indiqués dans le rapport ainsi qu'en fonction du type d'installation piézométrique utilisé. Ces conditions peuvent varier de façon saisonnière ou suite à des travaux de construction sur le site ou sur des sites adjacents. Ces variations sont hors du contrôle de SNC-Lavalin.

3. Niveaux de contamination

Les niveaux de contamination décrits dans ce rapport correspondent à ceux détectés à l'endroit et à la date indiqués dans le rapport. Ces niveaux peuvent varier selon les saisons ou par suite d'activités sur le site à l'étude ou sur des sites adjacents. Ces variations sont hors de notre contrôle. Les niveaux de contamination sont déterminés à partir des résultats des analyses chimiques effectuées sur un nombre limité d'échantillons de sol, d'eau de surface ou d'eau souterraine. La nature et le degré de contamination entre les points d'échantillonnage peuvent varier de façon importante de ceux à ces points. La composition chimique des eaux souterraines à chaque point échantillonnage est susceptible de changer en raison de l'écoulement souterrain, des conditions de recharge par la surface, de la sollicitation de la formation investiguée (i.e. puits de pompage ou d'injection à proximité du site) ainsi que de la variabilité saisonnière naturelle. La précision des niveaux de contamination de l'eau souterraine dépend de la fréquence et du nombre d'analyses effectuées. La liste des paramètres analysés est basée sur notre meilleure connaissance de l'historique du site et des contaminants susceptibles d'être trouvés sur le site et est également le reflet de considérations budgétaires et de délais d'exécution. Le fait qu'un paramètre n'ait pas été analysé n'exclut pas qu'il soit présent à une concentration supérieure au bruit de fond ou à la limite de détection de ce paramètre.

4. Suivi de l'étude et des travaux

a. Vérification en phase finale

Tous les détails de conception et de construction ne sont pas connus au moment de l'émission du rapport. Il est donc recommandé que les services de SNC-Lavalin soient retenus pour apporter toute la lumière sur les conséquences que pourraient avoir les travaux de construction sur l'ouvrage final.

b. Inspection durant l'exécution

Il est recommandé que les services de SNC-Lavalin soient retenus pendant la construction, pour vérifier et confirmer d'une part que les conditions souterraines sur toute l'étendue du site ne diffèrent pas de celles données dans le rapport et d'autre part, que les travaux de construction n'auront pas un effet défavorable sur les conditions du site.

5. Changement des conditions

Les conditions de sol décrites dans ce rapport sont celles observées au moment de l'étude. À moins d'indication contraire, ces conditions forment la base des recommandations du rapport. Les conditions de sol peuvent être modifiées de façon significative par les travaux de construction (trafic, excavation, etc.) sur le site ou sur les sites adjacents. Une excavation peut exposer les sols à des changements dus à l'humidité, au séchage ou au gel. Sauf indication contraire, le sol doit être protégé de ces changements ou remaniements pendant la construction. Lorsque les conditions rencontrées sur le site diffèrent de façon significative de celles prévues dans ce rapport, dues à la nature hétérogène du sous-sol ou encore à des travaux de construction, il est du ressort du Client et de l'utilisateur de ce rapport de prévenir SNC-Lavalin des changements et de fournir à SNC-Lavalin l'opportunité de réviser les recommandations de ce rapport. Reconnaître un changement des conditions de sol demande une certaine expérience. Il est donc recommandé qu'un ingénieur géotechnicien expérimenté soit dépêché sur le site afin de vérifier si les conditions ont changé de façon significative.

6. Drainage

Le drainage de l'eau souterraine est souvent requis aussi bien pour des installations temporaires que permanentes du projet. Une conception ou exécution impropre du drainage peut avoir de sérieuses conséquences. SNC-Lavalin ne peut en aucun cas prendre la responsabilité des effets du drainage à moins que SNC-Lavalin ne soit spécifiquement impliqué dans la conception détaillée et le suivi des travaux de construction du système de drainage.

7. Caractérisation environnementale – Phase I (Phase I)

Ce rapport a été rédigé suite à des activités de recherche diligentes et à partir d'une évaluation de sources de données ponctuelles ou des renseignements obtenus auprès de tiers et qui peuvent comporter des incertitudes, lacunes ou omissions. Ces sources d'informations sont sujettes à des modifications au fil du temps, par exemple, selon l'évolution des activités sur le terrain à l'étude et ceux environnants. La Phase I n'inclut aucun essai, échantillonnage ou analyse de caractérisation par un laboratoire. Sauf exception, la Phase I s'appuie sur l'observation des composantes visibles et accessibles sur la propriété et celles voisines et qui pourraient porter un préjudice environnemental à la qualité du terrain à l'étude. Les titres de propriété mentionnés dans ce rapport sont utilisés pour identifier les anciens propriétaires du site à l'étude et ils ne peuvent en aucun cas être considérés comme document officiel pour reproduction ou d'autres types d'usages. Enfin, tout croquis, vue en plan ou schéma apparaissant dans le rapport ou tout énoncé spécifiant des dimensions, capacités, quantités ou distances sont approximatifs et sont inclus afin d'assister le lecteur à visualiser la propriété.

Annexe 2

Rapports de forage (F-01-18 à F-03-18)

SNC·LAVALIN

RAPPORT DE FORAGE

CLIENT : Lemay

PROJET : Sécurisation piste polyvalente, Canal Lachine

ENDROIT : Piste cyclable Lachine (secteur George-Étienne Cartier), Montréal

DOSSIER : 653793

FORAGE : F-01-18

DATE : 2018-05-14

PROFONDEUR (m)	NIVEAU (m) ARBITRAIRE	DESCRIPTION	NIVEAU D'EAU	ÉCHANTILLONS TYPE ET NUMÉRO	ÉCHANTILLONS ÉTAT	ÉCHANTILLONS RÉCUPÉRATION (%)	ESSAIS IN SITU ET EN LABORATOIRE N ou RQD (%)	TENEUR EN EAU ET LIMITES D'ATTERBERG (%) (W_P, W, W_L)	AUTRES ESSAIS	S_u (kPa), S_{us} (kPa), S_r (kPa), S_{rs} (kPa), N_{dc} (coups/300 mm)
	99.22							20 40 60 80		20 40 60 80
		Remblai : gravier sableux, traces de silt.			A				AC	
0.23	98.99	**Remblai :** pierre concassée et mâchefer.								
				CG-1	B	100	-		AC	
0.58	98.64	**Remblai :** pierre concassée de calibre 20-0 mm.			C				G	
0.79	98.43	**Remblai :** silt sableux et graveleux. Traces de bois et de mâchefer.			D					
1				CF-2		57	6		G	
1.52	97.70	**Fin du forage**								
2										
3										

REMARQUES :

MÉTHODE DE FORAGE : Enfoncement d'un échantillonneur à grand diamètre (PW) et d'un carottier fendu de calibre « B » à l'aide d'un marteau mécanique. Foreuse CME-75 montée sur camion.

SNC·LAVALIN

RAPPORT DE FORAGE

CLIENT : Lemay

PROJET : Sécurisation piste polyvalente, Canal Lachine

ENDROIT : Piste cyclable Lachine (secteur George-Étienne Cartier), Montréal

DOSSIER : 653793

FORAGE : F-02-18

DATE : 2018-05-14

PROFONDEUR (m)	NIVEAU (m) ARBITRAIRE	DESCRIPTION	NIVEAU D'EAU	ÉCHANTILLONS TYPE ET NUMÉRO	ÉCHANTILLONS ÉTAT	ÉCHANTILLONS RÉCUPÉRATION (%)	ESSAIS IN SITU ET EN LABORATOIRE N ou RQD (%)	TENEUR EN EAU ET LIMITES D'ATTERBERG (%)	AUTRES ESSAIS	S_u (kPa) S_{us} (kPa) S_r (kPa) S_{rs} (kPa) / N_{dc} (coups/300 mm)
	99.50							W_P W W_L — 20 40 60 80		20 40 60 80
		Sol organique.		A						
0.20	99.30	**Remblai :** sable silteux, un peu de pierre concassée. Traces de bois et de mâchefer.		CG-1 B		100	-		AC	
0.41	99.09	**Remblai :** sable et gravier concassé, traces de silt.		CF-2		64	56*		AC G	
				CF-3		100	56			
1.52	97.98	**Fin du forage**								

REMARQUES : * L'échantillon CF-2 a été prélevé avec un carottier fendu de calibre N de 64 mm de diamètre extérieur.

MÉTHODE DE FORAGE : Enfoncement d'un échantillonneur à grand diamètre (PW) et d'un carottier fendu de calibre « N » puis « B » à l'aide d'un marteau mécanique. Foreuse CME-75 montée sur camion.

SNC·LAVALIN

RAPPORT DE FORAGE

CLIENT : Lemay

PROJET : Sécurisation piste polyvalente, Canal Lachine

ENDROIT : Piste cyclable Lachine (secteur George-Étienne Cartier), Montréal

DOSSIER : 653793

FORAGE : F-03-18

DATE : 2018-05-14

PROFONDEUR (m)	NIVEAU (m) ARBITRAIRE	DESCRIPTION	NIVEAU D'EAU	ÉCHANTILLONS TYPE ET NUMÉRO	ÉCHANTILLONS ÉTAT	ÉCHANTILLONS RÉCUPÉRATION (%)	ESSAIS IN SITU ET EN LABORATOIRE N ou RQD (%)	TENEUR EN EAU ET LIMITES D'ATTERBERG (%)	AUTRES ESSAIS	ESSAIS IN SITU ET EN LABORATOIRE ▲s_u (kPa) ▼s_{us} (kPa) △s_r (kPa) ▽s_{rs} (kPa) ●N_{dc} (coups/300 mm)
	99.38							W_P — W — W_L ; 20 40 60 80		20 40 60 80
0.05	99.33	**Enrobé bitumineux**.		A						
		Fondation : pierre concassée de calibre 20-0 mm.		B					G AC	
				CG-1		89	-			
0.50	98.88	**Remblai :** sable graveleux et silteux.								
		Mâchefer noir.		C					AC G	
0.91	98.47	**Remblai :** mâchefer noir, un peu de sable silteux et traces de pierre concassée.								
				CF-2		48	20*			
1.52	97.86	**Fin du forage**								

REMARQUES : * L'échantillon CF-2 a été prélevé avec un carottier fendu de calibre N de 64 mm de diamètre extérieur.

MÉTHODE DE FORAGE : Enfoncement d'un échantillonneur à grand diamètre (PW) et d'un carottier fendu de calibre « N » à l'aide d'un marteau mécanique. Foreuse CME-75 montée sur camion.

Annexe 3

Essais de laboratoire : analyses granulométriques

SNC·LAVALIN

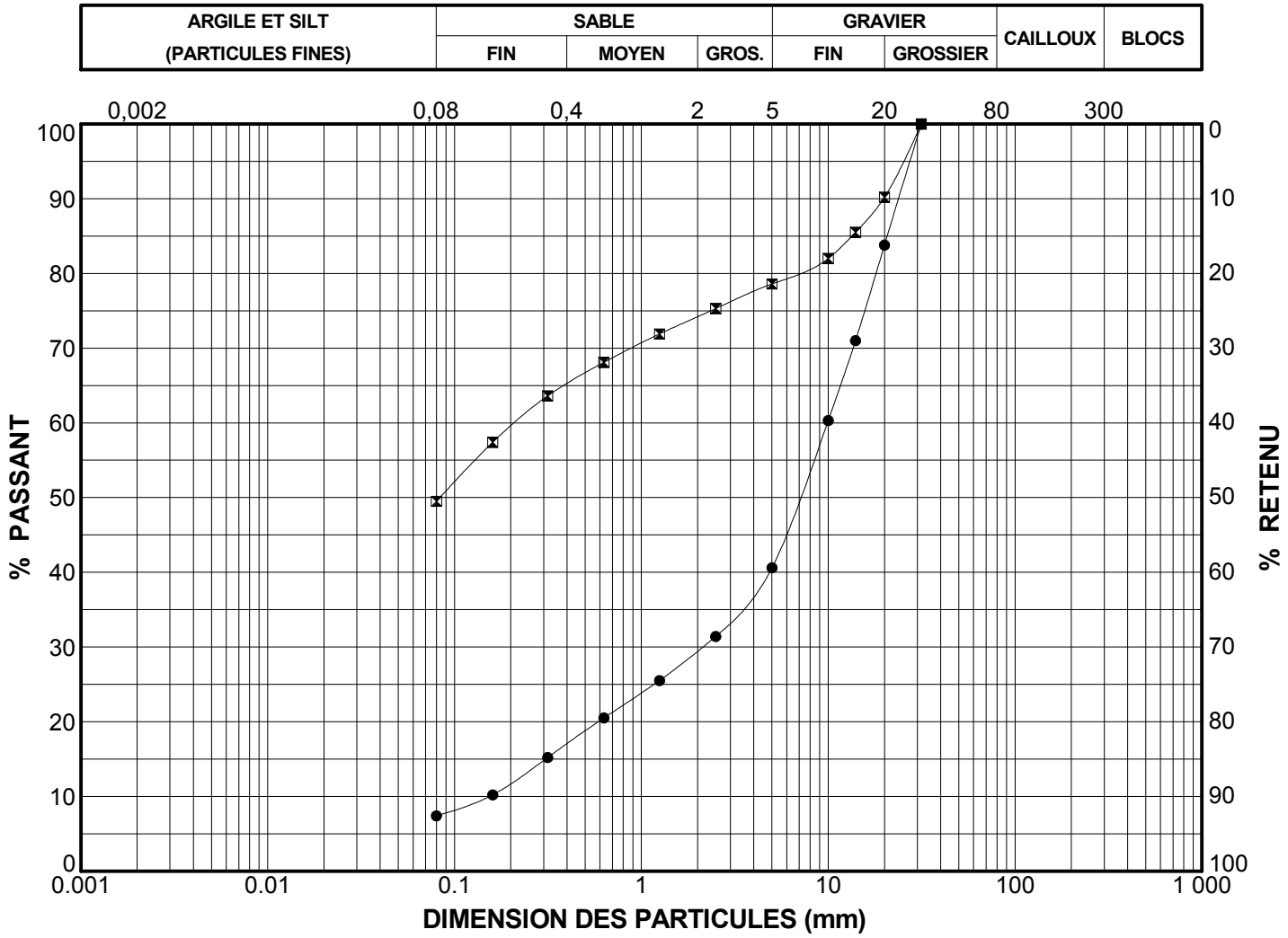
ANALYSE GRANULOMÉTRIQUE

CLIENT : Lemay

PROJET : Sécurisation piste polyvalente, Canal Lachine

ENDROIT : Piste cyclable Lachine (secteur George-Étienne Cartier), Montréal

DOSSIER : 653793



	Sondage	Éch.	Profondeur (m) de	Profondeur (m) à	Gravier (%)	Sable (%)	Silt et argile (%)	Description
●	F-01-18	CF-1C	0.58	0.79	59	33	7	**Pierre concassée** de calibre 20-0 mm.
⊠	F-01-18	CF-2	0.91	1.52	21	29	50	**Silt sableux et graveleux**.

REMARQUES :

SNC·LAVALIN

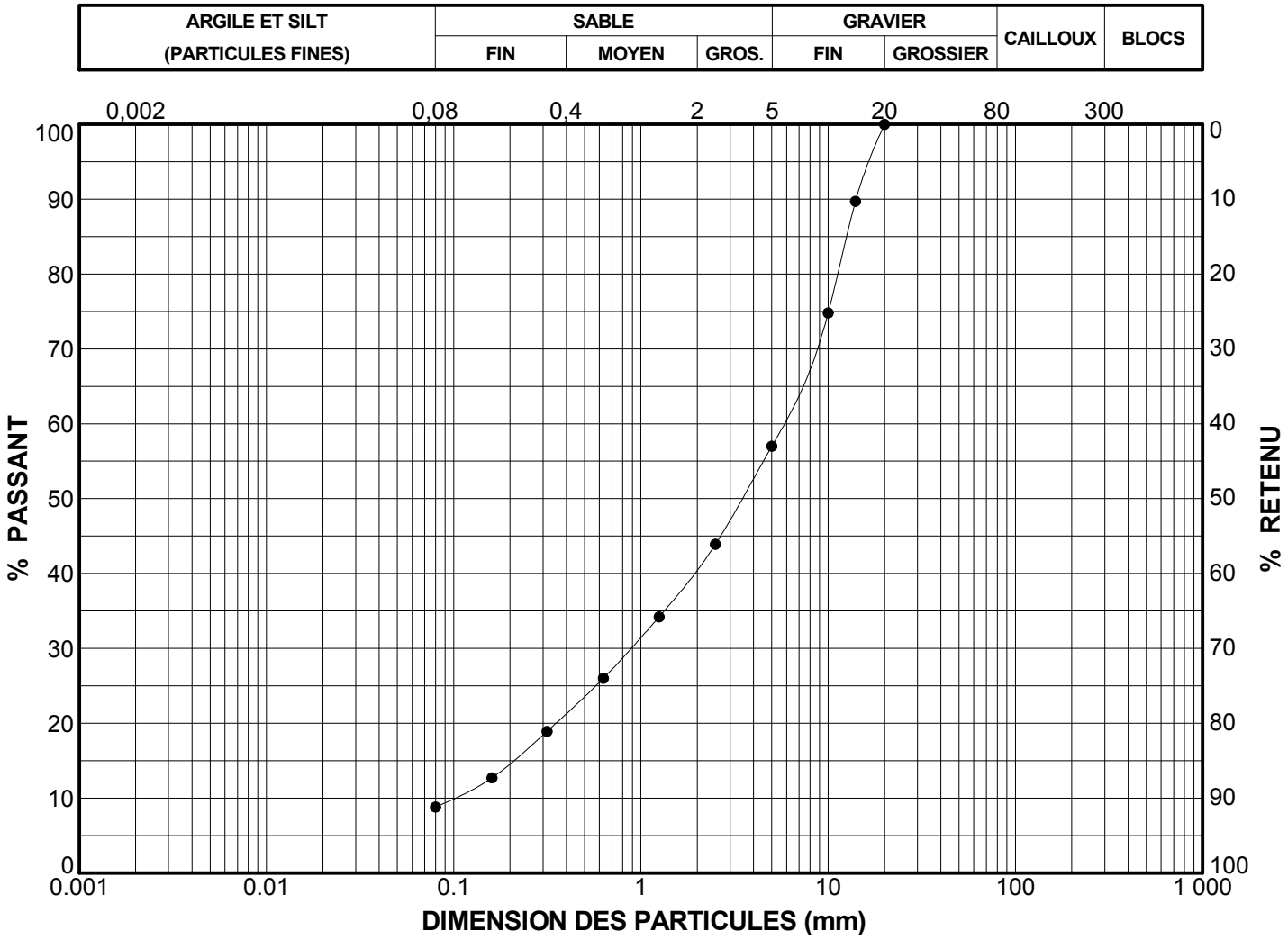
ANALYSE GRANULOMÉTRIQUE

CLIENT : Lemay

PROJET : Sécurisation piste polyvalente, Canal Lachine

ENDROIT : Piste cyclable Lachine (secteur George-Étienne Cartier), Montréal

DOSSIER : 653793



	Sondage	Éch.	Profondeur (m) de	Profondeur (m) à	Gravier (%)	Sable (%)	Silt et argile (%)	Description
●	F-02-18	CF-2	0.41	0.91	43	48	9	**Sable et gravier**, traces de silt.

REMARQUES :

SNC·LAVALIN

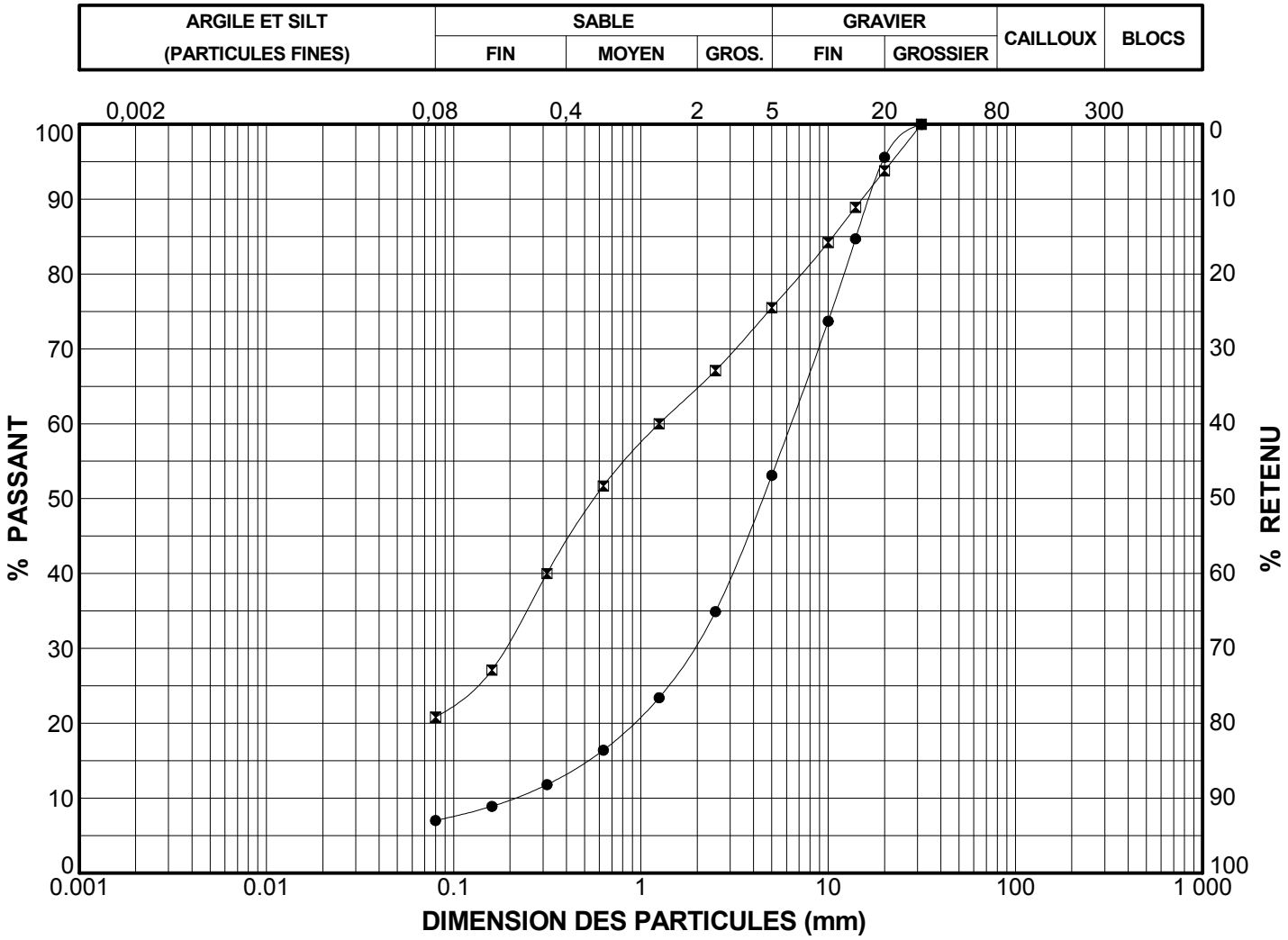
ANALYSE GRANULOMÉTRIQUE

CLIENT : Parc Canada

PROJET : Sécurisation piste polyvalente, Canal Lachine

ENDROIT : Piste cyclable Lachine (secteur George-Étienne Cartier), Lachine. Québec

DOSSIER : 653793



	Sondage	Éch.	Profondeur (m) de	Profondeur (m) à	Gravier (%)	Sable (%)	Silt et argile (%)	Description
●	F-03-18	CF-1B	0.05	0.50	47	46	7	**Pierre concassée** de calibre 20-0 mm.
⊠	F-03-18	CF-1C	0.50	0.91	25	55	21	**Sable graveleux et silteux**.

REMARQUES :

Annexe 4

Essais de laboratoire : analyses chimiques

NOTES EXPLICATIVES
ANALYSES CHIMIQUES - SOLS

Notes:

(1) : Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés (MDDELCC)

(2) : Règlement sur la protection et la réhabilitation des terrains (Gouvernement du Québec)

(3) : Règlement sur l'enfouissement des sols contaminés (Gouvernement du Québec)

\- : Non analysé

-- : Aucun critère ou norme

: Concentration dans la plage A-B des critères du Guide d'intervention (1),

0,8

5,9 : Concentration dans la plage B-C des critères du Guide d'intervention(1), et supérieure aux normes de l'annexe I du Règlement sur la protection et la réhabilitation des terrains

300 : Concentration supérieure aux critères C du Guide d'intervention(1), et supérieure aux normes de l'annexe II du Règlement sur la protection et la réhabilitation des terrains

300 : Concentration supérieure ou égale aux normes de l'annexe I du Règlement sur l'enfouissement des sols contaminés

* Les résultats dans ce tableau sont rapportés sur base sèche, (Sauf indication contraire)

Les critères ABC exprimés dans ce tableau correspondent à ceux des Basses-Terres du St-Laurent.

En cas de disparité entre les résultats du présent document et ceux du certificat d'analyse officiel correspondant, les résultats du certificat d'analyse officiel ont priorité.

Tableau 4-1 : Sommaire des résultats analytiques pour les échantillons de sols

Paramètres	Unités	Guide d'intervention[1] / RPRT [2]			RESC [3]	Résultats analytiques				
		A	B / Annexe I	C / Annexe II	Annexe I	3620170	3620398 Duplicata (3620170)	3620171	3620362 Duplicata (3620171)	3620363 Duplicata (3620171)
Sondage / Échantillon Profondeur						F-01-18/ CF-1A 0.00-0.23 m	F-01-18/ CF-1A 0.00-0.23 m DUP1	F-01-18/ CF-1B 0.23-0.58 m	F-01-18/ CF-1B 0.23-0.58 m DUP1	F-01-18/ CF-1B 0.23-0.58 m DUP2
Date d'échantillonnage						2018-05-14	2018-05-25	2018-05-14	2018-05-25	2018-05-25
Hydrocarbures pétroliers C10-C50	mg/kg	300	700	3 500	10000	<100	-	134	-	-
Métaux										
Aluminium	mg/kg	--	--	--	--	6610	-	2760	-	-
Argent	mg/kg	2	20	40	200	< 0,5	-	< 0,5	-	-
Arsenic	mg/kg	6	30	50	250	0,9	-	**13,0**	-	-
Baryum	mg/kg	340	500	2 000	10 000	36	-	71	-	-
Cadmium	mg/kg	1,5	5	20	100	0,1	-	0,6	-	-
Chrome	mg/kg	100	250	800	4 000	11	-	6	-	-
Cobalt	mg/kg	25	50	300	1 500	2	-	4	-	-
Cuivre	mg/kg	50	100	500	2 500	6	-	28	-	-
Étain	mg/kg	5	50	300	1 500	< 1	-	5	-	-
Manganèse	mg/kg	1 000	1 000	2 200	11 000	76	-	224	-	-
Molybdène	mg/kg	2	10	40	200	< 0,5	-	1,6	-	-
Nickel	mg/kg	50	100	500	2 500	7	-	8	-	-
Plomb	mg/kg	50	500	1 000	5 000	6	-	**73**	-	-
Sélénium	mg/kg	1	3	10	50	< 0,5	-	< 0,5	-	-
Zinc	mg/kg	140	500	1 500	7 500	17	-	**930**	-	-
Autres composés inorganiques										
Humidité	%	--	--	--	--	21,3	21,8	6,2	-	-
HAP										
Acénaphtène	mg/kg	0,1	10	100	100	<0,1	-	<0,1	<0,1	<0,1
Acénaphtylène	mg/kg	0,1	10	100	100	<0,1	-	<0,1	<0,1	<0,1
Anthracène	mg/kg	0,1	10	100	100	<0,1	-	**0,2**	0,1	**0,2**
Benzo(a)anthracène	mg/kg	0,1	1	10	34	<0,1	-	**0,6**	**0,4**	**0,5**
Benzo(a)pyrène	mg/kg	0,1	1	10	34	<0,1	-	**0,7**	**0,5**	**0,6**
Benzo(b)fluoranthène	mg/kg	0,1	1	10	--	<0,1	-	**0,5**	**0,4**	**0,5**
Benzo(j)fluoranthène	mg/kg	0,1	1	10	--	<0,1	-	**0,4**	**0,3**	**0,3**
Benzo(k)fluoranthène	mg/kg	0,1	1	10	--	<0,1	-	**0,3**	**0,2**	**0,3**
Sommation des benzo(b+j+k)fluoranthène	mg/kg	--	--	--	136	<ND>	-	1,2	0,9	1,1
Benzo(c)phenanthrène	mg/kg	0,1	1	10	56	<0,1	-	<0,1	<0,1	<0,1
Benzo(g,h,i)pérylène	mg/kg	0,1	1	10	18	<0,1	-	**0,4**	**0,4**	**0,4**
Chrysène	mg/kg	0,1	1	10	34	<0,1	-	**0,7**	**0,5**	**0,6**
Dibenzo(a,h)anthracène	mg/kg	0,1	1	10	82	<0,1	-	<0,1	<0,1	<0,1
Dibenzo(a,i)pyrène	mg/kg	0,1	1	10	34	<0,1	-	<0,1	<0,1	<0,1
Dibenzo(a,h)pyrène	mg/kg	0,1	1	10	34	<0,1	-	<0,1	<0,1	<0,1
Dibenzo(a,l)pyrène	mg/kg	0,1	1	10	34	<0,1	-	<0,1	<0,1	<0,1
7,12-Diméthylbenzo (a) anthracène	mg/kg	0,1	1	10	34	<0,1	-	<0,1	<0,1	<0,1
Fluoranthène	mg/kg	0,1	10	100	100	<0,1	-	**1,1**	**0,7**	**1,1**
Fluorène	mg/kg	0,1	10	100	100	<0,1	-	<0,1	<0,1	<0,1
Indéno (1,2,3-cd) pyrène	mg/kg	0,1	1	10	34	<0,1	-	**0,4**	**0,3**	**0,3**
3-Méthylcholanthrène	mg/kg	0,1	1	10	150	<0,1	-	<0,1	<0,1	<0,1
Naphtalène	mg/kg	0,1	5	50	56	<0,1	-	0,1	<0,1	<0,1
Phénanthrène	mg/kg	0,1	5	50	56	<0,1	-	**0,7**	**0,5**	**0,8**
Pyrène	mg/kg	0,1	10	100	100	<0,1	-	**1,0**	**0,7**	**1,0**
2-Méthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	-	**0,2**	0,1	0,1
1-Méthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	-	**0,2**	0,1	0,1
1,3-Diméthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	-	**0,2**	**0,2**	**0,2**
2,3,5-Triméthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	-	<0,1	<0,1	<0,1

Tableau 4-1 : Sommaire des résultats analytiques pour les échantillons de sols

Paramètres	Unités	Guide d'intervention[1] / RPRT [2]			RESC [3]	Résultats analytiques				
		A	B / Annexe I	C / Annexe II	Annexe I	3620172	3620174	3620175	3620176	3620177
Sondage / Échantillon **Profondeur**						F-02-18/ CF-4B 0.20-0.41 m	F-02-18/ CF-2 0.41-0.51 m	F-03-18/ CF-1B 0.05-0.50 m	F-03-18/ CF-1C 0.50-0.81 m	DC-01
Date d'échantillonnage						2018-05-14	2018-05-14	2018-05-14	2018-05-14	2018-05-14
Hydrocarbures pétroliers C10-C50	mg/kg	300	700	3 500	10000	<100	**1190**	<100	**314**	145
Métaux										
Aluminium	mg/kg	--	--	--	--	6290	6050	1590	3380	6960
Argent	mg/kg	2	20	40	200	< 0,5	< 0,5	< 0,5	< 0,5	< 0,5
Arsenic	mg/kg	6	30	50	250	5,2	2,6	2,5	**18,8**	**6,9**
Baryum	mg/kg	340	500	2 000	10 000	118	79	10	107	105
Cadmium	mg/kg	1,5	5	20	100	0,2	0,2	< 0,1	0,9	0,4
Chrome	mg/kg	100	250	800	4 000	17	14	5	17	19
Cobalt	mg/kg	25	50	300	1 500	8	4	5	6	6
Cuivre	mg/kg	50	100	500	2 500	**57**	14	6	**127**	**58**
Étain	mg/kg	5	50	300	1 500	**8**	2	< 1	**24**	**8**
Manganèse	mg/kg	1 000	1 000	2 200	11 000	477	372	462	305	360
Molybdène	mg/kg	2	10	40	200	1,1	0,8	< 0,5	**2,2**	1,1
Nickel	mg/kg	50	100	500	2 500	23	11	11	33	24
Plomb	mg/kg	50	500	1 000	5 000	**76**	20	3	**181**	**74**
Sélénium	mg/kg	1	3	10	50	< 0,5	< 0,5	< 0,5	0,7	< 0,5
Zinc	mg/kg	140	500	1 500	7 500	109	39	15	**349**	**166**
Autres composés inorganiques										
Humidité	%	--	--	--	--	11,9	6,5	2,3	16,4	13,8
HAP										
Acénaphtène	mg/kg	0,1	10	100	100	<0,1	<0,1	<0,1	<0,1	<0,1
Acénaphtylène	mg/kg	0,1	10	100	100	0,1	<0,1	<0,1	**0,3**	**0,2**
Anthracène	mg/kg	0,1	10	100	100	**0,2**	<0,1	<0,1	**0,2**	0,1
Benzo(a)anthracène	mg/kg	0,1	1	10	34	**0,6**	**0,2**	<0,1	**0,5**	**0,4**
Benzo(a)pyrène	mg/kg	0,1	1	10	34	**0,7**	**0,2**	<0,1	**0,7**	**0,6**
Benzo(b)fluoranthène	mg/kg	0,1	1	10	--	**0,6**	**0,2**	<0,1	**0,9**	**0,7**
Benzo(j)fluoranthène	mg/kg	0,1	1	10	--	**0,4**	<0,1	<0,1	**0,5**	**0,4**
Benzo(k)fluoranthène	mg/kg	0,1	1	10	--	**0,3**	<0,1	<0,1	**0,4**	**0,3**
Sommation des benzo(b+j+k)fluoranthène	mg/kg	--	--	--	136	1,4	0,2	<ND>	1,9	1,4
Benzo(c)phenanthrène	mg/kg	0,1	1	10	56	0,1	<0,1	<0,1	0,1	<0,1
Benzo(g,h,i)pérylène	mg/kg	0,1	1	10	18	**0,5**	**0,2**	<0,1	**0,9**	**0,7**
Chrysène	mg/kg	0,1	1	10	34	**0,7**	**0,3**	<0,1	**0,9**	**0,7**
Dibenzo(a,h)anthracène	mg/kg	0,1	1	10	82	0,1	<0,1	<0,1	**0,2**	0,1
Dibenzo(a,i)pyrène	mg/kg	0,1	1	10	34	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo(a,h)pyrène	mg/kg	0,1	1	10	34	<0,1	<0,1	<0,1	<0,1	<0,1
Dibenzo(a,l)pyrène	mg/kg	0,1	1	10	34	<0,1	<0,1	<0,1	<0,1	<0,1
7,12-Diméthylbenzo (a) anthracène	mg/kg	0,1	1	10	34	<0,1	<0,1	<0,1	<0,1	<0,1
Fluoranthène	mg/kg	0,1	10	100	100	**1,4**	**0,4**	<0,1	**1,1**	**0,8**
Fluorène	mg/kg	0,1	10	100	100	<0,1	<0,1	<0,1	<0,1	<0,1
Indéno (1,2,3-cd) pyrène	mg/kg	0,1	1	10	34	**0,4**	0,1	<0,1	**0,7**	**0,5**
3-Méthylcholanthrène	mg/kg	0,1	1	10	150	<0,1	<0,1	<0,1	<0,1	<0,1
Naphtalène	mg/kg	0,1	5	50	56	<0,1	<0,1	<0,1	**1,4**	**0,5**
Phénanthrène	mg/kg	0,1	5	50	56	**0,7**	**0,3**	<0,1	**1,1**	**0,5**
Pyrène	mg/kg	0,1	10	100	100	**1,2**	**0,4**	<0,1	**1,0**	**0,7**
2-Méthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	<0,1	<0,1	**2,2**	**0,7**
1-Méthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	<0,1	<0,1	**1,6**	**0,5**
1,3-Diméthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	<0,1	<0,1	**1,5**	**0,5**
2,3,5-Triméthylnaphtalène	mg/kg	0,1	1	10	56	<0,1	<0,1	<0,1	**0,3**	0,1

Annexe 5

Certificat d’analyse

Certificat d'analyses

Numéro de demande d'analyse: **18-885121**

Demande d'analyse reçue le: 2018-05-24

Date d'émission du certificat: 2018-06-01

Numéro de version du certificat: 1

☑ Certificat d'analyse officiel

☐ Certificat d'analyse préliminaire

Requérant

Snc-Lavalin Gem Quebec Inc, division Montérégie

591 Le Breton
Longueuil, Québec, Canada
J4G 1R9
Téléphone : (514) 331-6910
Télécopieur : (450) 674-3370

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

Commentaires

Les critères génériques du "Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés" inclus dans ce certificat sont à titre indicatif seulement.
Les critères A pour les métaux correspondent à ceux de la région des Basses-Terres du St-Laurent.
Les critères D, si inclus dans le présent certificat, correspondent aux critères du "Règlement sur l'enfouissement des sols contaminés" et sont à titre indicatif seulement.

Cette version remplace et annule toute version antérieure, le cas échéant.

<ND> : Non-détecté NA : Information non-fournie et/ou non-applicable

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Saint-Augustin-de-Desmaures
Québec, Canada
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F | 418-878-7185
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Pointe-Claire
Québec, Canada
H9R 1E6

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F | 514-697-2090
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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

	No Labo.	Échantillon(s) 3620170	3620171	3620172	3620174
	Votre Référence	F-01-18/ CF-1A/ 0.00-0.23m	F-01-18/ CF-1B/ 0.23-0.58m	F-02-18/ CF-4B/ 0.20-0.41m	F-02-18/ CF-2/ 0.41-0.51m
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	CD	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence					
Aluminium (Al) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-06-01	2018-06-01	2018-06-01	2018-06-01
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Aluminium	mg/kg	6610	2760	6290	6050
Argent (Ag) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Argent	mg/kg	< 0.5 (<A)	< 0.5 (<A)	< 0.5 (<A)	< 0.5 (<A)
Arsenic (As) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Arsenic	mg/kg	0.9 (<A)	13.0 (A-B)	5.2 (<A)	2.6 (<A)
Baryum (Ba) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Baryum	mg/kg	36 (<A)	71 (<A)	118 (<A)	79 (<A)
Cadmium (Cd) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Cadmium	mg/kg	0.1 (<A)	0.6 (<A)	0.2 (<A)	0.2 (<A)
Chrome (Cr) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Chrome	mg/kg	11 (<A)	6 (<A)	17 (<A)	14 (<A)
Cobalt (Co) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Cobalt	mg/kg	2 (<A)	4 (<A)	8 (<A)	4 (<A)

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G3A 2C8

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Québec, Canada
H9R 1E6

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F | 514-697-2090
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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)			
	No Labo.	**3620170**	**3620171**	**3620172**	**3620174**
	Votre Référence	F-01-18/ CF-1A/ 0.00-0.23m	F-01-18/ CF-1B/ 0.23-0.58m	F-02-18/ CF-4B/ 0.20-0.41m	F-02-18/ CF-2/ 0.41-0.51m
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	CD	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence					
Cuivre (Cu) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Cuivre	mg/kg	6 (<A)	28 (<A)	57 (A-B)	14 (<A)
Étain (Sn) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Étain	mg/kg	< 1 (<A)	5 (A)	8 (A-B)	2 (<A)
Manganèse (Mn) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Manganèse	mg/kg	76 (<A)	224 (<A)	477 (<A)	372 (<A)
Molybdène (Mo) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Molybdène	mg/kg	< 0.5 (<A)	1.6 (<A)	1.1 (<A)	0.8 (<A)
Nickel (Ni) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Nickel	mg/kg	7 (<A)	8 (<A)	23 (<A)	11 (<A)
Plomb (Pb) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Plomb	mg/kg	6 (<A)	73 (A-B)	76 (A-B)	20 (<A)
Sélénium (Se) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Sélénium	mg/kg	< 0.5 (<A)	< 0.5 (<A)	< 0.5 (<A)	< 0.5 (<A)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)			
	No Labo.	**3620170**	**3620171**	**3620172**	**3620174**
	Votre Référence	F-01-18/ CF-1A/ 0.00-0.23m	F-01-18/ CF-1B/ 0.23-0.58m	F-02-18/ CF-4B/ 0.20-0.41m	F-02-18/ CF-2/ 0.41-0.51m
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	CD	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence					
Zinc (Zn) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630	619630
Zinc	mg/kg	17 (<A)	930 (B-C)	109 (<A)	39 (<A)

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Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

	Échantillon(s)		
No Labo.	**3620175**	**3620176**	**3620177**
Votre Référence	F-03-18/ CF-1B/ 0.05-0.50m	F-03-18/ CF-1C/ 0.50-0.81m	DC-01
Matrice	Sol	Sol	Sol
Prélevé par	CD	CD	CD
Lieu de prélèvement	NA	NA	NA
Prélevé le	2018-05-14	2018-05-14	2018-05-14
Reçu Labo	2018-05-24	2018-05-24	2018-05-24

Paramètre(s) / Méthode / Référence				
Aluminium (Al) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-06-01	2018-06-01	2018-06-01
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Aluminium	mg/kg	1590	3380	6960
Argent (Ag) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Argent	mg/kg	< 0.5 (<A)	< 0.5 (<A)	< 0.5 (<A)
Arsenic (As) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Arsenic	mg/kg	2.5 (<A)	18.8 (A-B)	6.9 (A-B)
Baryum (Ba) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Baryum	mg/kg	10 (<A)	107 (<A)	105 (<A)
Cadmium (Cd) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Cadmium	mg/kg	< 0.1 (<A)	0.9 (<A)	0.4 (<A)
Chrome (Cr) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Chrome	mg/kg	5 (<A)	17 (<A)	19 (<A)
Cobalt (Co) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Cobalt	mg/kg	5 (<A)	6 (<A)	6 (<A)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)		
	No Labo.	**3620175**	**3620176**	**3620177**
	Votre Référence	F-03-18/ CF-1B/ 0.05-0.50m	F-03-18/ CF-1C/ 0.50-0.81m	DC-01
	Matrice	Sol	Sol	Sol
	Prélevé par	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence				
Cuivre (Cu) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Cuivre	mg/kg	6 (<A)	127 (B-C)	58 (A-B)
Étain (Sn) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Étain	mg/kg	< 1 (<A)	24 (A-B)	8 (A-B)
Manganèse (Mn) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Manganèse	mg/kg	462 (<A)	305 (<A)	360 (<A)
Molybdène (Mo) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Molybdène	mg/kg	< 0.5 (<A)	2.2 (A-B)	1.1 (<A)
Nickel (Ni) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Nickel	mg/kg	11 (<A)	33 (<A)	24 (<A)
Plomb (Pb) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Plomb	mg/kg	3 (<A)	181 (A-B)	74 (A-B)
Sélénium (Se) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Sélénium	mg/kg	< 0.5 (<A)	0.7 (<A)	< 0.5 (<A)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)		
	No Labo.	**3620175**	**3620176**	**3620177**
	Votre Référence	F-03-18/ CF-1B/ 0.05-0.50m	F-03-18/ CF-1C/ 0.50-0.81m	DC-01
	Matrice	Sol	Sol	Sol
	Prélevé par	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence				
Zinc (Zn) extractible total	Préparation	2018-05-29	2018-05-29	2018-05-29
Analyses des métaux. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-30	2018-05-30	2018-05-30
PC-EN-CHI-PON037 (MA. 200-Mét)	No. séquence	619630	619630	619630
Zinc	mg/kg	15 (<A)	349 (A-B)	166 (A-B)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)			
	No Labo.	**3620170**	**3620171**	**3620172**	**3620174**
	Votre Référence	F-01-18/ CF-1A/ 0.00-0.23m	F-01-18/ CF-1B/ 0.23-0.58m	F-02-18/ CF-4B/ 0.20-0.41m	F-02-18/ CF-2/ 0.41-0.51m
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	CD	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence					
Hydrocarbures Aromatiques Polycycliques	Préparation	2018-05-25	2018-05-25	2018-05-25	2018-05-25
HAP & phénols par GC-MS. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-25	2018-05-25	2018-05-25	2018-05-25
PC-EN-CHO-PON005 (MA400 HAP)	No. séquence	619441	619441	619441	619441
Naphtalène	mg/kg	<0.1 (<A)	0.1 (A)	<0.1 (<A)	<0.1 (<A)
1-Méthylnaphtalène	mg/kg	<0.1 (<A)	0.2 (A-B)	<0.1 (<A)	<0.1 (<A)
2-Méthylnaphtalène	mg/kg	<0.1 (<A)	0.2 (A-B)	<0.1 (<A)	<0.1 (<A)
1,3-Diméthylnaphtalène	mg/kg	<0.1 (<A)	0.2 (A-B)	<0.1 (<A)	<0.1 (<A)
Acénaphthylène	mg/kg	<0.1 (<A)	<0.1 (<A)	0.1 (A)	<0.1 (<A)
Acénaphtène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
2,3,5-Triméthylnaphtalène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Fluorène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Phénanthrène	mg/kg	<0.1 (<A)	0.7 (A-B)	0.7 (A-B)	0.3 (A-B)
Anthracène	mg/kg	<0.1 (<A)	0.2 (A-B)	0.2 (A-B)	<0.1 (<A)
Fluoranthène	mg/kg	<0.1 (<A)	1.1 (A-B)	1.4 (A-B)	0.4 (A-B)
Pyrène	mg/kg	<0.1 (<A)	1.0 (A-B)	1.2 (A-B)	0.4 (A-B)
Benzo (c) phénanthrène	mg/kg	<0.1 (<A)	<0.1 (<A)	0.1 (A)	<0.1 (<A)
Benzo (a) anthracène	mg/kg	<0.1 (<A)	0.6 (A-B)	0.6 (A-B)	0.2 (A-B)
Chrysène	mg/kg	<0.1 (<A)	0.7 (A-B)	0.7 (A-B)	0.3 (A-B)
Benzo (b) fluoranthène	mg/kg	<0.1 (<A)	0.5 (A-B)	0.6 (A-B)	0.2 (A-B)
Benzo (k) fluoranthène	mg/kg	<0.1 (<A)	0.3 (A-B)	0.3 (A-B)	<0.1 (<A)
Benzo (j) fluoranthène	mg/kg	<0.1 (<A)	0.4 (A-B)	0.4 (A-B)	<0.1 (<A)
Sommation benzo (b, j et k) fluoranthène	mg/kg	<ND>	1.2 (B-C)	1.4 (B-C)	0.2 (A-B)
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Benzo (a) pyrène	mg/kg	<0.1 (<A)	0.7 (A-B)	0.7 (A-B)	0.2 (A-B)
3-Méthylcholanthrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Indéno (1,2,3-cd) pyrène	mg/kg	<0.1 (<A)	0.4 (A-B)	0.4 (A-B)	0.1 (A)
Dibenzo (a,h) anthracène	mg/kg	<0.1 (<A)	<0.1 (<A)	0.1 (A)	<0.1 (<A)
Benzo (g,h,i) pérylène	mg/kg	<0.1 (<A)	0.4 (A-B)	0.5 (A-B)	0.2 (A-B)
Dibenzo (a,l) pyrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Dibenzo (a,i) pyrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Dibenzo (a,h) pyrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)			
	No Labo.	**3620170**	**3620171**	**3620172**	**3620174**
	Votre Référence	F-01-18/ CF-1A/ 0.00-0.23m	F-01-18/ CF-1B/ 0.23-0.58m	F-02-18/ CF-4B/ 0.20-0.41m	F-02-18/ CF-2/ 0.41-0.51m
	Matrice	Sol	Sol	Sol	Sol
	Prélevé par	CD	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence					
Sommation des HAP	mg/kg	<ND>	7.5	8.2	2.3
Pourcentage de récupération					
D10-Fluorène	%	103%	99%	94%	100%
D10-Pyrène	%	99%	100%	90%	98%
D12-Benzo(a)pyrène	%	103%	97%	91%	100%
Hydrocarbures pétroliers C10-C50	Préparation	2018-05-28	2018-05-28	2018-05-28	2018-05-28
Hydrocarbures pétroliers C10-C50. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-28	2018-05-28	2018-05-28	2018-05-28
PC-EN-CHO-PON002 (MA. 400 - HYD)	No. séquence	619568	619568	619568	619568
Hydrocarbures pétroliers C10-C50	mg/kg	<100 (<A)	134 (<A)	<100 (<A)	1190 (B-C)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)		
	No Labo.	**3620175**	**3620176**	**3620177**
	Votre Référence	F-03-18/ CF-1B/ 0.05-0.50m	F-03-18/ CF-1C/ 0.50-0.81m	DC-01
	Matrice	Sol	Sol	Sol
	Prélevé par	CD	CD	CD
	Lieu de prélèvement	NA	NA	NA
	Prélevé le	2018-05-14	2018-05-14	2018-05-14
	Reçu Labo	2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence				
Hydrocarbures Aromatiques Polycycliques	Préparation	2018-05-25	2018-05-25	2018-05-25
HAP & phénols par GC-MS. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-25	2018-05-25	2018-05-25
PC-EN-CHO-PON005 (MA400 HAP)	No. séquence	619441	619441	619441
Naphtalène	mg/kg	<0.1 (<A)	1.4 (A-B)	0.5 (A-B)
1-Méthylnaphtalène	mg/kg	<0.1 (<A)	1.6 (B-C)	0.5 (A-B)
2-Méthylnaphtalène	mg/kg	<0.1 (<A)	2.2 (B-C)	0.7 (A-B)
1,3-Diméthylnaphtalène	mg/kg	<0.1 (<A)	1.5 (B-C)	0.5 (A-B)
Acénaphthylène	mg/kg	<0.1 (<A)	0.3 (A-B)	0.2 (A-B)
Acénaphtène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
2,3,5-Triméthylnaphtalène	mg/kg	<0.1 (<A)	0.3 (A-B)	0.1 (A)
Fluorène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Phénanthrène	mg/kg	<0.1 (<A)	1.1 (A-B)	0.5 (A-B)
Anthracène	mg/kg	<0.1 (<A)	0.2 (A-B)	0.1 (A)
Fluoranthène	mg/kg	<0.1 (<A)	1.1 (A-B)	0.8 (A-B)
Pyrène	mg/kg	<0.1 (<A)	1.0 (A-B)	0.7 (A-B)
Benzo (c) phénanthrène	mg/kg	<0.1 (<A)	0.1 (A)	<0.1 (<A)
Benzo (a) anthracène	mg/kg	<0.1 (<A)	0.5 (A-B)	0.4 (A-B)
Chrysène	mg/kg	<0.1 (<A)	0.9 (A-B)	0.7 (A-B)
Benzo (b) fluoranthène	mg/kg	<0.1 (<A)	0.9 (A-B)	0.7 (A-B)
Benzo (k) fluoranthène	mg/kg	<0.1 (<A)	0.4 (A-B)	0.3 (A-B)
Benzo (j) fluoranthène	mg/kg	<0.1 (<A)	0.5 (A-B)	0.4 (A-B)
Sommation benzo (b, j et k) fluoranthène	mg/kg	<ND>	1.9 (B-C)	1.4 (B-C)
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Benzo (a) pyrène	mg/kg	<0.1 (<A)	0.7 (A-B)	0.6 (A-B)
3-Méthylcholanthrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Indéno (1,2,3-cd) pyrène	mg/kg	<0.1 (<A)	0.7 (A-B)	0.5 (A-B)
Dibenzo (a,h) anthracène	mg/kg	<0.1 (<A)	0.2 (A-B)	0.1 (A)
Benzo (g,h,i) pérylène	mg/kg	<0.1 (<A)	0.9 (A-B)	0.7 (A-B)
Dibenzo (a,l) pyrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Dibenzo (a,i) pyrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)
Dibenzo (a,h) pyrène	mg/kg	<0.1 (<A)	<0.1 (<A)	<0.1 (<A)

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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

		Échantillon(s)		
No Labo.		**3620175**	**3620176**	**3620177**
Votre Référence		F-03-18/ CF-1B/ 0.05-0.50m	F-03-18/ CF-1C/ 0.50-0.81m	DC-01
Matrice		Sol	Sol	Sol
Prélevé par		CD	CD	CD
Lieu de prélèvement		NA	NA	NA
Prélevé le		2018-05-14	2018-05-14	2018-05-14
Reçu Labo		2018-05-24	2018-05-24	2018-05-24
Paramètre(s) Méthode Référence				
Sommation des HAP	mg/kg	<ND>	16.7	9.2
Pourcentage de récupération				
D10-Fluorène	%	103%	85%	97%
D10-Pyrène	%	100%	83%	96%
D12-Benzo(a)pyrène	%	103%	82%	96%
Hydrocarbures pétroliers C10-C50	Préparation	2018-05-28	2018-05-28	2018-05-28
Hydrocarbures pétroliers C10-C50. Résultats sur base sèche. (Accrédité)	Analyse	2018-05-28	2018-05-28	2018-05-28
PC-EN-CHO-PON002 (MA. 400 - HYD)	No. séquence	619568	619568	619568
Hydrocarbures pétroliers C10-C50	mg/kg	<100 (<A)	314 (A-B)	145 (<A)

Note 1 : Ces résultats et commentaires, le cas échéant, ne se rapportent qu'aux échantillons soumis pour les analyses réalisées au site de Pointe-Claire (#307).

Fatima Sobh, chimiste

237 rue de Liverpool
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Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Hydrocarbures Aromatiques Polycycliques					
No Séquence: 619441					
Naphtalène	mg/kg	< 0.1	<0.1	0.8	0.6 - 1
1-Méthylnaphtalène	mg/kg	< 0.1	<0.1	0.8	0.6 - 1
2-Méthylnaphtalène	mg/kg	< 0.1	<0.1	0.7	0.5 - 1
1,3-Diméthylnaphtalène	mg/kg	< 0.1	<0.1	0.7	0.5 - 1
Acénaphthylène	mg/kg	< 0.1	<0.1	0.8	0.6 - 1
Acénaphtène	mg/kg	< 0.1	<0.1	0.8	0.6 - 1
2,3,5-Triméthylnaphtalène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Fluorène	mg/kg	< 0.1	<0.1	0.8	0.6 - 1
Phénanthrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Anthracène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Fluoranthène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Pyrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Benzo (c) phénanthrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Benzo (a) anthracène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Chrysène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Benzo (b) fluoranthène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Benzo (k) fluoranthène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Benzo (j) fluoranthène	mg/kg	< 0.1	<0.1	0.8	0.6 - 1
Sommation benzo (b, j et k) fluoranthène	mg/kg	< 0.1	<ND>	2.2	1.7 - 3.1
7,12-Diméthylbenzo (a) anthracène	mg/kg	< 0.1	<0.1	0.4	0.4 - 0.8
Benzo (a) pyrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
3-Méthylcholanthrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Indéno (1,2,3-cd) pyrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Dibenzo (a,h) anthracène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Benzo (g,h,i) pérylène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Dibenzo (a,l) pyrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Dibenzo (a,i) pyrène	mg/kg	< 0.1	<0.1	0.7	0.6 - 1
Dibenzo (a,h) pyrène	mg/kg	< 0.1	<0.1	0.9	0.6 - 1
Sommation des HAP	mg/kg	< 0.1	<ND>	NA	NA
Hydrocarbures pétroliers C10-C50					
No Séquence: 619568					
Hydrocarbures pétroliers C10-C50	mg/kg	< 100	<100	576	350 - 650
Argent (Ag) extractible total					
No Séquence: 619630					
Argent	mg/kg	< 0.5	< 0.5	145	125 - 187
Aluminium (Al) extractible total					
No Séquence: 619630					
Aluminium	mg/kg	< 10	< 10	6000	5050 - 7580

LDR : Limite de détection rapportée

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F | 418-878-7185
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Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Arsenic (As) extractible total					
No Séquence: 619630					
Arsenic	mg/kg	< 0.5	< 0.5	92.2	87 - 131
Baryum (Ba) extractible total					
No Séquence: 619630					
Baryum	mg/kg	< 5	< 5	114	86 - 130
Cadmium (Cd) extractible total					
No Séquence: 619630					
Cadmium	mg/kg	< 0.1	< 0.1	91.0	90 - 136
Cobalt (Co) extractible total					
No Séquence: 619630					
Cobalt	mg/kg	< 1	< 1	91	90 - 136
Chrome (Cr) extractible total					
No Séquence: 619630					
Chrome	mg/kg	< 1	< 1	109	101 - 151
Cuivre (Cu) extractible total					
No Séquence: 619630					
Cuivre	mg/kg	< 1	< 1	94	90 - 134
Manganèse (Mn) extractible total					
No Séquence: 619630					
Manganèse	mg/kg	< 1	< 1	184	165 - 247
Molybdène (Mo) extractible total					
No Séquence: 619630					
Molybdène	mg/kg	< 0.5	< 0.5	89.6	86 - 130
Nickel (Ni) extractible total					
No Séquence: 619630					
Nickel	mg/kg	< 1	1	116	107 - 161
Plomb (Pb) extractible total					
No Séquence: 619630					
Plomb	mg/kg	< 1	< 1	131	121 - 181
Sélénium (Se) extractible total					
No Séquence: 619630					
Sélénium	mg/kg	< 0.5	< 0.5	109	80 - 120
Étain (Sn) extractible total					
No Séquence: 619630					
Étain	mg/kg	< 1	< 1	100	80 - 120
Zinc (Zn) extractible total					
No Séquence: 619630					

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T | 514-697-3273
F | 514-697-2090
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Client: **Snc-Lavalin Gem Quebec Inc, division Montérégie** **Numéro de demande: 18-885121**

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

Résultats du Contrôle de Qualité (CQ)

Paramètres (No.Séquence)	Unité	LDR	Blanc	Contrôle certifié	
				Obtenu	Attendu (Intervalle)
Zinc	mg/kg	< 5	< 5	514	473 - 709

Commentaires CQ

Séquence no. 619630 : Nickel : Blanc positif non soustrait des échantillons. / Positive blank not subtracted from the samples.

LDR : Limite de détection rapportée

237 rue de Liverpool
Saint-Augustin-de-Desmaures
Québec, Canada
G3A 2C8

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T | 418-878-4927
F | 418-878-7185
www.Eurofins.ca/Env

121 Boulevard Hymus
Pointe-Claire
Québec, Canada
H9R 1E6

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Numéro de demande: 18-885121

Bon de commande	Votre Projet	Chargé de Projet
NA	653793	M. Damien Grellet

Résultats du Contrôle de Qualité (CQ) - 2e partie

Paramètres (No.Séquence)	Unité	Duplicata		
		Valeur 1	Valeur 2	Écart (%)
Hydrocarbures Aromatiques Polycycliques				
No Séquence: 619441	(No éch)		(3620171)	
Naphtalène	mg/kg	0.1	<0.1	-
Naphtalène	mg/kg	0.1	<0.1	-
1-Méthylnaphtalène	mg/kg	0.2	0.1	66.7
1-Méthylnaphtalène	mg/kg	0.2	0.1	66.7
2-Méthylnaphtalène	mg/kg	0.2	0.1	66.7
2-Méthylnaphtalène	mg/kg	0.2	0.1	66.7
1,3-Diméthylnaphtalène	mg/kg	0.2	0.2	0.0
1,3-Diméthylnaphtalène	mg/kg	0.2	0.2	0.0
Acénaphthylène	mg/kg	<0.1	<0.1	-
Acénaphthylène	mg/kg	<0.1	<0.1	-
Acénaphtène	mg/kg	<0.1	<0.1	-
Acénaphtène	mg/kg	<0.1	<0.1	-
2,3,5-Triméthylnaphtalène	mg/kg	<0.1	<0.1	-
2,3,5-Triméthylnaphtalène	mg/kg	<0.1	<0.1	-
Fluorène	mg/kg	<0.1	<0.1	-
Fluorène	mg/kg	<0.1	<0.1	-
Phénanthrène	mg/kg	0.7	0.5	33.3
Phénanthrène	mg/kg	0.7	0.8	13.3
Anthracène	mg/kg	0.2	0.1	66.7
Anthracène	mg/kg	0.2	0.2	0.0
Fluoranthène	mg/kg	1.1	1.1	0.0
Fluoranthène	mg/kg	1.1	0.7	44.4
Pyrène	mg/kg	1.0	1.0	0.0
Pyrène	mg/kg	1.0	0.7	35.3
Benzo (c) phénanthrène	mg/kg	<0.1	<0.1	-
Benzo (c) phénanthrène	mg/kg	<0.1	<0.1	-
Benzo (a) anthracène	mg/kg	0.6	0.5	18.2
Benzo (a) anthracène	mg/kg	0.6	0.4	40.0
Chrysène	mg/kg	0.7	0.5	33.3
Chrysène	mg/kg	0.7	0.6	15.4
Benzo (b) fluoranthène	mg/kg	0.5	0.5	0.0
Benzo (b) fluoranthène	mg/kg	0.5	0.4	22.2
Benzo (k) fluoranthène	mg/kg	0.3	0.3	0.0
Benzo (k) fluoranthène	mg/kg	0.3	0.2	40.0
Benzo (j) fluoranthène	mg/kg	0.4	0.3	28.6
Benzo (j) fluoranthène	mg/kg	0.4	0.3	28.6
Sommation benzo (b, j et k) fluoranthène	mg/kg	1.2	1.1	8.7
Sommation benzo (b, j et k) fluoranthène	mg/kg	1.2	0.9	28.6
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1	<0.1	-

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Bon de commande	Votre Projet	Chargé de Projet
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Résultats du Contrôle de Qualité (CQ) - 2e partie

Paramètres (No.Séquence)	Unité	Duplicata		
		Valeur 1	Valeur 2	Écart (%)
7,12-Diméthylbenzo (a) anthracène	mg/kg	<0.1	<0.1	-
Benzo (a) pyrène	mg/kg	0.7	0.5	33.3
Benzo (a) pyrène	mg/kg	0.7	0.6	15.4
3-Méthylcholanthrène	mg/kg	<0.1	<0.1	-
3-Méthylcholanthrène	mg/kg	<0.1	<0.1	-
Indéno (1,2,3-cd) pyrène	mg/kg	0.4	0.3	28.6
Indéno (1,2,3-cd) pyrène	mg/kg	0.4	0.3	28.6
Dibenzo (a,h) anthracène	mg/kg	<0.1	<0.1	-
Dibenzo (a,h) anthracène	mg/kg	<0.1	<0.1	-
Benzo (g,h,i) pérylène	mg/kg	0.4	0.4	0.0
Benzo (g,h,i) pérylène	mg/kg	0.4	0.4	0.0
Dibenzo (a,l) pyrène	mg/kg	<0.1	<0.1	-
Dibenzo (a,l) pyrène	mg/kg	<0.1	<0.1	-
Dibenzo (a,i) pyrène	mg/kg	<0.1	<0.1	-
Dibenzo (a,i) pyrène	mg/kg	<0.1	<0.1	-
Dibenzo (a,h) pyrène	mg/kg	<0.1	<0.1	-
Dibenzo (a,h) pyrène	mg/kg	<0.1	<0.1	-
Sommation des HAP	mg/kg	7.5	5.3	34.4
Sommation des HAP	mg/kg	7.5	7.1	5.5

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Annexe 6

Annexe 5 : Grille de gestion des sols excavés du *Guide d'intervention - Protection des sols et réhabilitation des terrains contaminés*

Annexe 5 : Grille de gestion des sols excavés

La grille de gestion des sols excavés ne s'applique, pour les critères supérieurs à A, que pour une contamination de nature anthropique. Si la concentration naturelle dans le sol est supérieure à A, la gestion des sols contenant cette concentration naturelle est considérée comme équivalente à celle attribuable au critère A.

≤ critère A[1]

Utilisés sans restriction sur tout terrain.

< critère B (valeurs limites de l'annexe I du RPRT)

1. Ailleurs que sur le terrain d'origine, les sols ne peuvent être déposés que sur des sols dont la concentration en contaminants est égale ou supérieure à celle des sols remblayés (article 4 du RSCTSC) et s'ils n'émettent pas d'odeurs d'hydrocarbures perceptibles.
2. Aux mêmes conditions, déposés sur ou dans des terrains destinés à l'habitation s'ils sont utilisés comme matériau de remblayage dans le cadre de travaux de réhabilitation de terrains faits conformément à la LQE.

≤ critère B (valeurs limites de l'annexe I du RPRT)

1. Valorisés sur le terrain d'origine ou sur le terrain à partir duquel a eu lieu l'activité à l'origine de la contamination.
2. Valorisés comme matériau de recouvrement journalier ou final dans un lieu d'enfouissement technique (LET) ou comme matériau de recouvrement hebdomadaire ou final dans un lieu d'enfouissement en tranchée ou comme recouvrement mensuel ou final dans un lieu d'enfouissement de débris de construction ou de démolition, conformément au REIMR aux conditions des articles 42, 50, 90, 91, 105 ou 106.
3. Valorisés comme recouvrement final dans un lieu d'enfouissement de sols contaminés (LESC) aux conditions décrites à l'article 38 du RESC ou valorisés dans un système de captage des gaz prévu à l'article 13 du RESC.
4. Valorisés comme recouvrement final d'un lieu de dépôt définitif de matières dangereuses aux conditions de l'article 101 du RMD.
5. Valorisés comme matériau de recouvrement final dans un système de gestion qui comporte le dépôt définitif par enfouissement de déchets de fabriques de pâtes et papiers, aux conditions de l'article 116 du Règlement sur les fabriques de pâtes et papiers (RFPP).
6. Valorisés sur un lieu d'élimination nécessitant un recouvrement, aux conditions prévues au certificat d'autorisation en vertu de l'article 22 de la LQE.
7. Valorisés avec ou sans MRF, comme matériau apte à la végétation dans des projets de restauration d'aires d'accumulation de résidus miniers[2] ou dans la couverture de lieux visés par le RFPP, le RESC ou le RMD. Ne doit dégager aucune odeur d'hydrocarbures perceptible. Dans le cas d'ajout de MRF, le projet doit être autorisé et respecter le *Guide sur l'utilisation de matières résiduelles fertilisantes pour la restauration de la couverture végétale de lieux dégradés*[3].
8. Valorisés comme couche de protection d'une géomembrane utilisée dans un système multicouche lors de la restauration d'une aire d'accumulation de résidus miniers générateurs d'acide[2].

9. Éliminés dans un lieu d'enfouissement visé par le RESC.
10. Éliminés dans un LET, un lieu d'enfouissement en tranchée, un lieu d'enfouissement en milieu nordique, un lieu d'enfouissement de débris de construction ou de démolition ou un lieu d'enfouissement en territoire isolé, conformément à l'article 4 du REIMR.

≥ critère B et ≤ critère C

1. Utilisés sur le terrain d'origine comme matériau de remblayage à la condition que les concentrations mesurées respectent les critères ou valeurs limites réglementaires applicables aux sols selon l'usage et le zonage.
2. Valorisés comme matériau de recouvrement dans un LET ou comme matériau de recouvrement hebdomadaire dans un lieu d'enfouissement en tranchée, aux conditions des articles 42, 50 ou 90 du REIMR. Ces conditions incluent notamment que les concentrations de composés organiques volatils soient égales ou inférieures aux critères B.
3. Traités sur place ou dans un lieu de traitement autorisé.
4. Éliminés dans un lieu d'enfouissement visé par le RESC.

< annexe I du RESC

1. Utilisés pour remplir des dépressions naturelles ou des excavations sur le terrain d'origine lors de travaux de réhabilitation aux conditions prévues dans le plan de réhabilitation approuvé dans le cadre d'une analyse de risques (dossiers GTE), à la condition que les C_{10}-C_{50} et les COV respectent les critères d'usage.
2. Traités sur place ou dans un lieu de traitement autorisé.
3. Éliminés dans un lieu d'enfouissement visé par le RESC.

≥ annexe I du RESC

1. Décontaminés sur place ou dans un lieu de traitement autorisé et gestion selon le résultat obtenu. Si cela est impossible, éliminés dans un lieu d'enfouissement visé par le RESC pour les exceptions mentionnées à l'article 4.1º a, b ou c.

Cas particuliers

1. Des sols contaminés peuvent être utilisés, à condition de ne dégager aucune odeur d'hydrocarbures perceptible, pour la construction d'un écran visuel ou antibruit dont l'utilité est démontrée :
    a. Sur un terrain résidentiel avec des sols du terrain d'origine :
        i. dont les concentrations sont ≤ B;
        ii. dont les concentrations sont ≤ C, lors de travaux de réhabilitation sur le terrain réalisés conformément au plan de réhabilitation approuvé dans le cadre d'une analyse de risque (dossiers GTE), sous les mesures de confinement, à condition que les sols contiennent des concentrations ≤ B en C_{10}-C_{50} et en composés organiques volatils (COV)[4];
        iii. dont les concentrations sont < annexe I du RESC, lors de travaux de réhabilitation sur le terrain réalisés conformément au plan de réhabilitation approuvé dans le cadre d'une analyse de risque (dossiers GTE), sous les mesures de confinement, à condition que les sols en place soient de niveau > C et que les sols déposés contiennent des concentrations ≤ B en C_{10}-C_{50} et en COV[4];

b. Sur un terrain commercial/industriel avec des sols du terrain d'origine :

   i. dont les concentrations sont ≤ C;

   ii. dont les concentrations sont ≤ C, lors de travaux de réhabilitation sur le terrain réalisés conformément au plan de réhabilitation approuvé dans le cadre d'une analyse de risque (dossiers GTE), sous les mesures de confinement;

   iii. dont les concentrations sont < annexe I du RESC, lors de travaux de réhabilitation sur le terrain réalisés conformément au plan de réhabilitation approuvé dans le cadre d'une analyse de risque (dossiers GTE), sous les mesures de confinement, à condition que les sols en place soient > C, et que les sols déposés contiennent des concentrations ≤ C en C_{10}-C_{50} et en COV[4].

2. La valorisation de sols contaminés dans un procédé en remplacement d'une matière vierge est possible aux conditions de l'autorisation.

3. Les sols ≥ B peuvent être acheminés sur les aires de résidus miniers, s'ils sont contaminés exclusivement par des métaux ou métalloïdes résultant des activités minières de l'entreprise responsable de l'aire, aux conditions de l'autorisation délivrée par le Ministère (article 6 du RSCTSC).

4. Les sols ≥ B peuvent être acheminés dans un lieu de dépôt définitif de matières dangereuses aux conditions du certificat d'autorisation détenu par ce lieu pour recevoir des sols.

Note : S'il y a présence de matières résiduelles dans les sols, se référer à la figure 12 de la section 7.7.2.

1. S'il est établi que la concentration naturelle dans le sol importé est supérieure au critère A et à la concentration du sol récepteur, il est recommandé au propriétaire du terrain récepteur de garder une trace du remblayage (localisation, niveau de contamination, provenance des sols importés), de façon à ce qu'il puisse, le cas échéant, démontrer qu'il ne s'agit pas d'une contamination anthropique. Faute de l'existence d'une telle trace, le Ministère considérera que les sols ont été contaminés par l'activité humaine et ils devront donc être gérés comme tels. Advenant le cas où les concentrations naturelles excèdent largement les critères génériques recommandés pour l'usage qui est fait du terrain récepteur, un avis sur les possibles risques à la santé et l'à-propos du remblayage avec de tels sols pourra être demandé à la direction de santé publique.

2. Ne s'applique pas aux sols contaminés = B, à moins que ces sols n'aient d'abord transité par un lieu visé à l'article 6 du Règlement sur le stockage et les centres de transfert de sols contaminés. Les sols excavés ≥ B ne peuvent en effet être acheminés directement que dans des lieux légalement autorisés à les recevoir et listés à l'article 6 du RSCTSC.

3. Il faudra toutefois s'assurer que la valorisation de sols A-B, auxquels on aura ajouté des matières fertilisantes ou non, entraîne un effet bénéfique, par exemple, sur la croissance de la végétation, et que ces sols répondent à un besoin réel, l'ajout de sols n'étant pas essentiel dans tous les cas de restauration minière. Il sera possible de s'assurer du bien-fondé du projet de valorisation et de son contrôle dans le cadre du certificat d'autorisation délivré préalablement à sa réalisation.

4. L'écran visuel ou antibruit doit être recouvert de 1 m de sols ≤ A ou de 40 cm ≤ A aux endroits recouverts d'une structure permanente (asphalte ou béton). Il est possible d'utiliser des MRF dans la couche apte à la végétation selon les orientations du *Guide sur l'utilisation des matières résiduelles fertilisantes pour la restauration de la couverture végétale des lieux dégradés* si la résultante est ≤ A.

SNC·LAVALIN
3420, boul. Saint-Joseph Est
Montréal (Québec) Canada H1X 1W6
Tél. : 514.331.6910 - Téléc. : 514.255.1400

<table>
<tr><th>Composantes des travaux</th><th>Composantes valorisées</th><th>Description des impacts</th><th>Mesures d'atténuation des impacts</th><th>Importance des impacts résiduels</th></tr>
<tr><td rowspan="2">1. Planification générale</td><td>➢ Faune, flore et services écosystémiques</td><td>• Perturbation de la faune en période critique (p. ex. mortalité des oisillons, destruction des nids, etc.)
• Modification de l'habitat en période critique</td><td>1.1 Veiller à ce que tous les travailleurs passent en revue les mesures d'atténuation et toutes les considérations propres au site avant le début des travaux.
1.2 Éviter toutes les périodes et les endroits fauniques sensibles selon le tableau suivant :
<table>
<tr><th></th><th>JANV.</th><th>FÉV.</th><th>MARS</th><th>AVRIL</th><th>MAI</th><th>JUIN</th><th>JUILLET</th><th>AOÛT</th><th>SEPTEMBRE</th><th>OCTOBRE</th><th>NOV.</th><th>DÉC.</th></tr>
<tr><td>Oiseaux</td><td colspan="3">Migration - Risque moindre de causer des dommages</td><td colspan="4">Nidification - ÉVITER L'ENLÈVEMENT DE LA VÉGÉTATION</td><td colspan="4">Migration - Risque moindre de causer des dommages</td></tr>
<tr><td>Tortues</td><td colspan="3">Hibernation et accouplement - ÉVITER LES TRAVAUX EN EAU DANS LES SECTEURS D'ENFOUISSEMENT POTENTIELS (berges, plages de sable)</td><td colspan="2">Émergence et déplacement aux sites de nidification - PRUDENCE LORS DES DÉPLACEMENTS DE MACHINERIE (mortalité sur les routes)</td><td colspan="3">Nidification – ÉVITER LES TRAVAUX DANS LES SECTEURS PROPICES (berges, plages de sable)</td><td colspan="2">Éclosion des œufs - ÉVITER LES TRAVAUX DANS LES SECTEURS PROPICES (berges, plages de sable)</td><td colspan="2">Émergence et déplacement aux sites d'hibernation - PRUDENCE LORS DES DÉPLACEMENTS DE MACHINERIE (mortalité sur les routes)</td><td>Hibernation - ÉVITER LES TRAVAUX EN EAU DANS LES SECTEURS D'ENFOUISSEMENT POTENTIELS</td></tr>
<tr><td>Couleuvres</td><td colspan="3">Hibernation - ÉVITER LA PERTURBATION DES HIBERNACLES (dépressions naturelles, terriers, talus de construction, intérieur de rondins, amoncellement de débris, cavité dans les murs et routes)</td><td>Émergence et accouplement</td><td colspan="2">Gestation, déplacement - ÉVITER LES PERTURBATIONS DES HABITATS ESTIVAUX (friches, terrains vagues, zones à débris)</td><td colspan="3">Mise bas - ÉVITER LES ZONES DE MISE BAS POTENTIELLES (zones humides et proies à proximité)</td><td>Déplacement vers hibernacle et 2e accouplement</td><td colspan="2">Hibernation - ÉVITER LA PERTURBATION DES HIBERNACLES</td></tr>
</table>
1.3 Présenter un plan de mobilisation qui délimite, sur une parcelle déjà perturbée (p. ex. route, surface en gravier), les chemins d'accès au site ainsi que les différentes aires nécessaire au projet telles que l'aire de travail, l'aire de rassemblement, l'aire d'entreposage, l'aire de nettoyage de la machinerie, les stationnements et en préciser la durée d'utilisation. Ces aires doivent avoir été approuvées par l'employé désigné de l'APC.
1.4 Prévoir les travaux de débroussaillage à des moments qui minimiseront l'érosion (p. ex. éviter les périodes de sécheresse et de pluies de forte amplitude).
1.5 Éviter les éléments fragiles (faune, flore, ressources culturelles) et toute zone d'activité restreinte connexe désignée par l'unité de gestion. Si d'autres éléments fragiles sont trouvés, cesser tous les travaux immédiatement et consulter le personnel désigné de l'APC afin de déterminer les prochaines étapes.</td><td rowspan="2">Négligeable, temporaire et localisé</td></tr>
<tr><td>➢ Expérience et sécurité du visiteur</td><td>• Augmentation du niveau de bruit ambiant et nuisance sonore</td><td>1.6 Identifier les principales personnes-ressources, ainsi que leurs rôles et responsabilités respectifs avant d'entreprendre les travaux et transmettre l'information à tous les travailleurs sur place.
1.7 Respecter toutes les lois, réglementations, normes, codes et bonnes pratiques relatifs à la santé et sécurité du public, aux bruits et tout autre risque reliés aux composantes des travaux.
1.8 Choisir de l'équipement adapté à la nature du travail à exécuter. Par exemple, éviter d'utiliser de la machinerie lourde si des outils manuels peuvent convenir.
1.9 Minimiser, si possible, l'empiètement sur la piste cyclable et sur le sentier piéton.
1.10 Arrêter les moteurs de la machinerie, les outils et équipements bruyants lors des arrêts ou pauses des travaux.
1.11 Élaborer et mettre en œuvre un plan de détour de la piste cyclable et du sentier piéton si les travaux empiètent sur ces derniers.
1.12 Informer le public et les résidents par un plan de communication efficace (p. ex. pancarte) qui décrit les travaux qui sont à venir.</td><td>Nul une fois les travaux terminés</td></tr>
</table>

Composantes des travaux	Composantes valorisées	Description des impacts	Mesures d'atténuation des impacts	Importance des impacts résiduels
2. Mise en chantier / Démobilisation	➢ Qualité de l'air ➢ Santé humaine ➢ Flore	• Émission de gaz à effet de serre (CO, CO_2, NO_x) et d'O_3 et de particules fines dans l'air (poussières) • Apport de contaminants dans le sol et l'eau	2.1 Les toilettes mobiles doivent être installées loin des systèmes d'égouts pluviaux, des zones sensibles d'un point de vue environnemental (arbres, canal, etc.) et des routes pavées. S'assurer qu'elles sont bien ancrées au sol. 2.2 S'assurer que les systèmes d'échappement et antipollution de la machinerie, de l'équipement et tout autre matériel de construction soient maintenus en bon état. 2.3 Arrêter les moteurs de la machinerie, les outils et équipements à moteur lors des arrêts ou pauses des travaux. 2.4 Se conformer à la règlementation municipale en vigueur (Règlement 90 de la Communauté métropolitaine de Montréal) en ce qui a trait aux émissions de poussières dans l'air. 2.5 Éviter la manipulation et le transport de matériaux pouvant facilement s'éroder ou lorsqu'un panache de poussière est visible. 2.6 S'assurer que les matériaux fins utilisés pour la construction de même que les résidus soient confinés durant leur transport. Mettre en place des mesures appropriées pour réduire les émissions de poussières dans l'air (ex. arrosage des matériaux secs, balayage, utilisation de bâches, etc.). 2.7 S'assurer que la machinerie terrestre est propre et exempte d'EEE et de mauvaises herbes nuisibles à son arrivée sur le site et la maintenir dans cet état par la suite. Si la machinerie utilisée sur l'un des sites des travaux doit être utilisée sur un autre site des travaux, procéder au nettoyage de cette machinerie conformément aux *recommandations du National Oceanic and Atmospheric Administration*.	Négligeable, temporaire et localisé
	➢ Ambiance sonore	• Augmentation du niveau de bruit ambiant et nuisance sonore	2.8 Se conformer à la règlementation municipale en vigueur en matière de bruit, d'horaire de travail et de nuisances. 2.9 Gérer le chantier de façon à minimiser les travaux qui engendrent des activités sonores importantes. 2.10 Dans la mesure du possible, planifier les activités bruyantes de façon à réduire au minimum les répercussions sur les visiteurs et les résidents à proximité. 2.11 Arrêter les moteurs de la machinerie, les outils et équipements à moteur lors des arrêts ou pauses des travaux.	Nul une fois les travaux terminés
3. Débroussaillage, abattage, élagage de végétation	➢ Faune, flore et services écosystémiques	• Risque de dommages au système racinaire, aux branches et à l'écorce des arbres dus aux déplacements de la machinerie • Destruction ou modification de l'habitat pour la faune • Mortalité d'individus fauniques causée par les activités du projet • Introduction ou dispersion d'EEE • Diminution de la capacité à filtrer l'air et l'eau • Augmentation du phénomène îlot de chaleur	*Arbres et arbustes* 3.1 Aucun arbre ne doit être abattu sans l'autorisation du Représentant de l'APC. 3.2 Protéger la végétation dans la zone des travaux incluant les arbres et les arbustes adjacents au chantier de construction du passage de machinerie. 3.3 Ne pas peinturer, endommager ou marquer des éléments naturels (ex. roches, arbres) présents sur le chantier et aux alentours pour fins d'arpentage ou autres avant d'en avoir obtenu préalablement l'autorisation de l'APC. 3.4 Les branches et autres matériaux récupérés doivent être transportés dans un site d'entreposage sans étendre de débris et sans endommager les arbres debout ou les éléments du paysage à l'extérieur des limites des travaux. 3.5 S'assurer que la machinerie terrestre est propre et exempte d'EEE et de mauvaises herbes nuisibles à son arrivée sur le site et la maintenir dans cet état par la suite. Si la machinerie utilisée sur l'un des sites des travaux doit être utilisée sur un autre site des travaux, procéder au nettoyage de cette machinerie conformément aux *recommandations du National Oceanic and Atmospheric Administration*. *Faune* 3.6 Si des animaux sont observés à l'intérieur ou à proximité du chantier, assurer une sortie adéquate et sécuritaire des lieux pour les éloigner des zones de conflits/accidents potentiels et signaler toute observation au Représentant de l'APC pour s'assurer du respect des exigences législatives reliées aux espèces en péril. 3.7 Ne pas tendre des pièges, harceler, nourrir, appâter, leurrer, empoisonner ou tuer des animaux sur le chantier. 3.8 En cas de découverte de nids, de tanières, de dortoirs, d'hibernacles ou d'aires de mise bas, suspendre les travaux et communiquer immédiatement avec le personnel désigné de Parcs Canada pour obtenir des directives. 3.9 Établir et délimiter une aire de protection des arbres et des arbustes à préserver (ex. rubans, barrières, etc.) sur le chantier et adjacents au chantier de construction ou aux voies de circulation afin de ne pas les endommager ou affecter le réseau racinaire et la ramure des arbres.	Négligeable, temporaire et localisé
4. Circulation de la machinerie	➢ Qualité des sols ➢ Qualité de l'eau ➢ Santé humaine	• Élargissement de l'empreinte anthropique • Tassement du sol et formation d'ornières	4.1 Utiliser des aires perturbées pour accéder au chantier et s'y déplacer. 4.2 Maintenir en bon état et entretenir régulièrement les véhicules et le matériel de construction. Réparer immédiatement ou enlever du chantier les véhicules ou équipements qui ont des fuites. 4.3 Lorsque les travaux incluent la perturbation des sols, éviter l'érosion des sédiments en installant la structure de contrôle appropriée (p. ex. barrières à sédiments sur tout le périmètre) en analysant le drainage de l'eau sur le chantier.	Négligeable, temporaire et localisé

Composantes des travaux	Composantes valorisées	Description des impacts	Mesures d'atténuation des impacts	Importance des impacts résiduels
5. Entreposage de matériaux et de matières dangereuses Utilisation, ravitaillement et nettoyage de la machinerie Gestion des remblais	➢ Qualité des sols ➢ Santé humaine	• Contamination des sols par des matières dangereuses (MD), des déchets et des fuites d'hydrocarbure par la machinerie • Contamination croisée • Sédimentation causant de la turbidité • Changement du régime de température et des profils de drainage naturels • La mise à nu de sol favorisant l'intrusion de contaminants • Érosion du sol, perte de terre végétale et exposition des sous-sols	*Entreposage* 5.1 Respecter toutes lois, règlements, normes et mesures préventives de santé et sécurité relatifs au cadenassage, à l'entreposage, à l'affichage, à la communication, à l'entretien de la zone d'entreposage, à la manipulation et à la disposition spécifiques aux matières dangereuses présentes sur le chantier. 5.2 Ranger, entretenir et ravitailler en carburant la machinerie sur une surface plane, à l'extérieur de la périphérie du feuillage des arbres à une distance minimale de 30 m des plans d'eau, mesurée à partir de la limite naturelle des hautes eaux. Accroître la largeur minimale de la zone tampon si le niveau de risque et les conditions propres au terrain l'exigent. 5.3 Pourvoir tous les chantiers de construction de conteneurs adéquats pour le stockage temporaire et sécuritaire des déchets dangereux, lesquels doivent être séparés par catégories. 5.4 Entreposer les produits pétrochimiques, les peintures et les produits chimiques à au moins 30 m des plans d'eau et les ranger en lieu sûr sous clé et sous verrou pendant la nuit dans une enceinte approuvée par Parcs Canada; accroître la largeur de la zone tampon si le niveau de risque et les conditions propres au terrain l'exigent. 5.5 Effectuer le ravitaillement en carburant sur une surface imperméable. 5.6 Nettoyer les fuites et les déversements qui surviennent pendant le ravitaillement et éliminer adéquatement les matières contaminées. 5.7 Ne jamais éliminer ou déposer du carburant dans l'environnement ou dans un plan d'eau. 5.8 Procéder au nettoyage des outils et de l'équipement hors site. S'il est nécessaire de le faire sur place, le nettoyage doit se faire à un endroit situé à moins 30 m de tout plan d'eau. *Hydrocarbures* 5.9 Veiller à ce qu'il y ait sur place en permanence une trousse d'intervention d'urgence en cas de déversement, renfermant le matériel absorbant et les bermes nécessaires pour contenir 110 % du plus important déversement possible (c.-à-d. carburant et autres liquides toxiques) pendant les travaux. Le personnel sur place doit en connaître l'emplacement et avoir reçu une formation sur son utilisation. Tout contaminant doit être récupéré à la source et éliminé conformément aux lois, aux politiques et aux règlements en vigueur. 5.10 Prévoir des trousses de récupération d'hydrocarbures en quantité suffisante (boudins de confinement, rouleaux absorbants, récipients étanches, etc.) et un extincteur de catégorie conforme aux normes en vigueur afin de gérer tout déversement, incident environnemental ou incendie. Le traitement et la réhabilitation des aires affectées doivent être entrepris sans délai. S'assurer que les travailleurs soient formés pour intervenir rapidement en cas de fuite ou de déversements. 5.11 Préparer une procédure d'urgence en cas de déversement, d'incident environnemental ou d'incendie et un plan de communication. Ce plan doit inclure, sans toutefois s'y limiter, les mesures prévues pour colmater les fuites dans les plus brefs délais, confiner les déversements afin de limiter leur étendue, décontaminer les zones touchées par le déversement accidentel afin de contrer l'infiltration en profondeur. 5.12 En cas d'incident environnemental, aviser l'APC, le service d'urgence d'Environnement Canada (1-866-283-2323) et toute autre autorité compétente en matière d'urgence environnementale.	Négligeable, temporaire et localisé

Composantes des travaux	Composantes valorisées	Description des impacts	Mesures d'atténuation des impacts	Importance des impacts résiduels
6. Excavation mineure	➢ Qualité de l'eau ➢ Qualité des sols ➢ Faune, flore et services écosystémiques	• Érosion et sédimentation • Sédimentation causant de la turbidité • Blocage des réseaux de drainage • Diminution des services écosystémiques • Enchevêtrement de la faune • Introduction ou dispersion d'EEE • Modification de l'habitat • Apport de substances contaminées dans l'environnement • Contamination croisée • Changement des profils de drainage	*Lutte contre l'érosion et de contrôle des sédiments* 6.1 Tous les ouvrages de lutte contre l'érosion et de contrôle des sédiments doivent être en place avant d'entreprendre les travaux. 6.2 Inspecter et entretenir régulièrement les ouvrages de lutte contre l'érosion et de contrôle des sédiments pendant toutes les phases du projet et les modifier au besoin. 6.3 Choisir des produits de lutte contre l'érosion et les sédiments correspondant à la nature et à la durée du projet. 6.4 Utiliser des produits de lutte contre l'érosion et la sédimentation fabriqués avec des matériaux biodégradables à 100 % (p. ex. jute, sisal ou fibre de coco). Veiller à ce que les matériaux de soutien soient eux aussi biodégradables. 6.5 Éviter d'utiliser du foin ou de la paille pour la lutte contre l'érosion et la sédimentation; ces matières risquent d'attirer les animaux sauvages et pourraient contenir des espèces envahissantes; en faire approuver l'utilisation par le personnel désigné de Parcs Canada. 6.6 Dans la mesure du possible, utiliser des produits de lutte contre l'érosion et la sédimentation qui réduisent à un minimum les risques d'enchevêtrement pour la faune. Voici les options : matelas anti-érosion sans filet fabriqués avec de la fibre de bois ou du paillis non tassé et clôtures anti-érosion non renforcées; tissu lâche ne présentant aucun danger pour la faune. 6.7 Éviter de procéder à l'excavation lors de fortes pluies ou de grands vents. 6.8 Mouiller les sols secs exposés pour réduire la poussière. 6.9 Limiter la durée d'exposition du sol. Réaliser les activités par étapes dans la mesure du possible et remettre en état les aires perturbées dès que possible. *Sols contaminés* 6.10Prendre les précautions nécessaires lors de l'entreposage temporaire des sols contaminés afin d'éviter la contamination des sols sous-jacents et adjacents. 6.11S'il y a lieu, un plan de caractérisation et un plan de réhabilitation environnementale pourront être exigés. La réhabilitation du site devra être effectuée selon le plan approuvé. 6.12Présenter un plan de gestion des sols contaminés à Parcs Canada pour approbation avant de procéder aux travaux d'excavation. 6.13En cas de découverte d'une contamination non documentée, suspendre les travaux immédiatement et communiquer avec le personnel désigné de Parcs Canada. 6.14La machinerie ayant entré en contact avec du sol contaminé devra être nettoyée adéquatement avant d'être utilisée dans d'autres secteurs. 6.15Remettre en place les sols le plus rapidement possible suivant les niveaux de contamination initialement observés et selon le profil stratigraphique initial. *Eaux* 6.16Drainer les trous creusés (mais ne pas acheminer l'eau directement dans le canal ou dans les égoûts), les remblayer et les compacter le plus rapidement possible. Employer des méthodes de travail qui génèrent le moins de poussière possible. 6.17Détourner les eaux de ruissellement des aires de travail, des sols exposés et des pentes érodables; veiller à ce qu'elles s'écoulent lentement à la surface. 6.18Limiter au minimum les changements à la surface du sol qui modifient ses caractéristiques d'infiltration et de ruissellement et maintenir ou rétablir un drainage de surface efficace à la fin du projet. *Remblais* 6.19Tout sol importé sur la propriété de l'APC doit être une terre de culture répondant aux plus récentes normes de qualité la Ville de Montréal et du Bureau de Normalisation du Québec. 6.20Le remblai devra faire l'objet d'une bonne compaction afin d'éviter tout affaissement, minimiser l'érosion et favoriser la reprise de la végétation. 6.21Pendant les périodes de dégel, compacter les matériaux de remblayage avant la remise en place de la terre végétale. Distribuer la terre végétale de façon égale sur la parcelle excavée conformément aux spécifications de Parcs Canada. 6.22Pendant les périodes de gel, répartir les matériaux sur la parcelle excavée de manière à ce qu'ils se tassent lors du dégel. Si possible, retarder la remise en place de la terre végétale jusqu'à ce que les matériaux de remblayage aient dégelé, qu'ils se soient tassés et qu'ils aient séché. 6.23Remblayer et compacter les excavations dès que possible. 6.24Fournir toutes les informations relatives aux surfaces restaurées (p. ex. profondeur, superficie, géolocalisation, composition, etc.).	Négligeable, temporaire et localisé

Composantes des travaux	Composantes valorisées	Description des impacts	Mesures d'atténuation des impacts	Importance des impacts résiduels
6. Excavation mineure (suite)	➢ Ressources culturelles et archéologiques	• Dommages aux vestiges et ressources archéologiques	6.25 Appliquer toute mesure d'atténuation définie précédemment par un archéologue de Parcs Canada, le Bureau d'examen des édifices fédéraux du patrimoine ou un autre spécialiste de la conservation (p. ex. paysages culturels ou caractéristiques du paysage qui revêtent une valeur patrimoniale) pour le chantier. 6.26 Éviter les sites archéologiques potentiels ou connus. 6.27 Éviter que les piles de matériaux n'endommagent ou n'ensevelissent des ressources culturelles. 6.28 En cas de découverte fortuite de ressources culturelles, cesser les travaux immédiatement puis informer le personnel désigné de Parcs Canada et le superviseur du chantier. 6.29 En cas de découverte d'éléments tels que des vestiges de structures ou des concentrations d'artefacts, les laisser en place, en marquer l'emplacement (p. ex. avec du ruban voyant) et communiquer avec le personnel désigné de Parcs Canada pour qu'il prenne des photographies et, si possible, des mesures de profondeur. Le représentant désigné de Parcs Canada doit transmettre l'information immédiatement à la section de l'archéologie terrestre pour qu'une évaluation de l'importance puisse être réalisée avant la reprise des travaux.	Négligeable, temporaire et localisé
7. Entreposage des matériaux de déblais	➢ Qualité des sols ➢ Qualité de l'eau	• Contamination croisée • Contamination des sols propres • Érosion et sédimentation	*Entreposage* 7.1 Entreposer séparément la terre végétale et les déblais; lorsque l'espace le permet, laisser une distance d'au moins 1 mètre entre les amas de terre végétale et les déblais. Dans un espace restreint, utiliser le matériel approprié (p. ex. géotextile) pour séparer les différentes matières. 7.2 Entreposer les déblais sur une toile imperméable et les recouvrir ou les entreposer dans tout autre type de dispositif de confinement hermétique. Les toiles devront être fixées solidement afin d'éviter qu'elles soient soulevées par le vent. 7.3 Gérer les sols excavés selon les lois et règlements fédéraux, provinciaux et municipaux applicables en matière de gestion des sols contaminés. 7.4 Limiter le temps d'entreposage in situ des matériaux excavés. 7.5 Éviter la contamination des sols sous-jacents et adjacents en prenant toutes les précautions nécessaires. 7.6 Ségréguer les sols selon leur niveau de contamination et selon la stratigraphie observée. 7.7 En tout temps, s'assurer que les sols ne migrent pas vers d'autres milieux, soit par voie aérienne, par ruissellement ou par transit de véhicule. *Disposition* 7.8 Au besoin, effectuer une caractérisation des sols excavés excédentaires afin de déterminer le degré de contamination et gérer adéquatement leur disposition. 7.9 Lors de la disposition des sols hors site, conserver tout document ou bordereau attestant de leur disposition dans des sites autorisés par le MDDELCC selon leur degré de contamination.	Négligeable, temporaire et localisé
8. Démolition de pavage Bétonnage (béton coulé et/ou projeté)	➢ Qualité de l'air ➢ Santé humaine ➢ Expérience du visiteur	• Émission de gaz à effet de serre (CO, CO_2, NO_x) et d'O_3 et de particules fines dans l'air (poussières) • Augmentation du niveau de bruit ambiant et nuisance sonore	*Les mêmes mesures que 2.1 à 2.11*	Négligeable, temporaire et localisé
	➢ Qualité de l'air ➢ Qualité des sols	• Apport de débris de construction et démolition • Dégradation de la qualité des sols	8.1 Prévoir des mesures afin de récupérer tous les débris et résidus qui tombent au sol provenant de la préparation des composantes de béton (ex. bâche, géotextile). 8.2 Nettoyer les débris de construction au fur et à mesure et en disposer dans les sites autorisés par le MDDELCC. 8.3 Les surplus de béton provenant des pompes à béton doivent être versés dans une enceinte confinée et étanche. Après durcissement, les résidus de béton doivent être gérés avec les déchets de construction et éliminés dans une installation approuvée. 8.4 Mélanger le béton sur des bâches à au moins 30 m des plans d'eau. Éviter que le ciment frais, mouillé et non durci et la poussière de béton n'entrent en contact avec les plans d'eau. 8.5 Contenir tous les déchets associés au béton et les transporter à une installation d'élimination approuvée. 8.6 Ne rejeter aucun déblai, matériaux, rebuts ou débris dans le milieu aquatique. Retirer tous débris introduits accidentellement dans le milieu aquatique dans les plus brefs délais.	Négligeable, temporaire et localisé

Composantes des travaux	Composantes valorisées	Description des impacts	Mesures d'atténuation des impacts	Importance des impacts résiduels
9. Resurfaçage au jet de sable ou au jet d'eau des garde-corps et des bollards contaminés au plomb Peinture des garde-corps, des bollards Marquage au sol	➢ Qualité de l'air ➢ Qualité de l'eau ➢ Qualité des sols ➢ Faune et flore	• Contamination de l'air, l'eau et du sol	*Peinture* 9.1 Mettre en place des mesures de protection pour éviter la dispersion des particules de peinture ou autre enduit, par exemple : - Éviter les périodes de grands vents; - Régler le débit du pistolet correctement; - Utiliser des écrans pour réduire au maximum les pertes par surpulvérisation. 9.2 Ne pas employer des produits contenant des substances interdites en vertu de la *Loi canadienne sur la protection de l'environnement* et de la règlementation qui en découle. 9.3 Se servir de bâches d'écoulement en plastique pour recueillir et contenir les gouttes, les déversements et les vapeurs de peinture. 9.4 Se servir de bâches pour transférer de la peinture ou d'autres produits d'étanchéité des contenants d'entreposage et de mélange vers des appareils ou des contenants d'application. S'efforcer d'utiliser des récipients de confinement secondaire ayant une capacité minimale équivalente à 110 % du volume du récipient contenant la peinture afin de réduire à un minimum le risque de déversement. 9.5 Nettoyer l'équipement de peinture dans un lieu approuvé par Parcs Canada; éviter que l'eau de lavage ne pénètre dans un plan d'eau. 9.6 Éliminer tous les déchets de peinture et de solutions peinture-solvant conformément aux lois fédérales, provinciales et municipales applicables. 9.7 Utiliser des produits qui présentent le moins d'effets néfastes pour l'environnement et s'assurer de leur conformité environnementale. *Résidus de resurfaçage* 9.8 Traiter les résidus de sablage et de peinture au plomb en tant que matières dangereuses résiduelles (MDR), tel que stipulé dans le Règlement sur les matières dangereuses. Mettre en place les mesures adéquates pour : - Récupérer la totalité des résidus de sablage et de peinture au plomb. - Entreposer les résidus de façon hermétique. - Disposer des résidus dans les sites autorisés par le MDDELCC. *Silice* 9.9 Respecter les teneurs admissibles précisées dans la règlementation en vigueur pour la silice dans l'abrasif du sablage au jet utilisé pour le nettoyage de l'acier d'armature et de la surface de béton. 9.10 Dans la mesure du possible, utiliser un abrasif présentant des impacts moins importants que la silice, p. ex. l'olivine. 9.11 Si l'abrasif utilisé contient de la silice, respecter les teneurs admissibles précisées dans la réglementation en vigueur. 9.12 Se référer au Règlement sur la qualité du milieu de travail, S-2.1, r. 11 et au Règlement sur la santé et la sécurité du travail, S-2.1, r. 13. 9.13 Utiliser des protections individuelles adéquates selon les valeurs d'exposition aux poussières (masque, gants, lunettes, etc.)	Négligeable, temporaire et localisé
10. Terrassement	➢ Qualité de l'eau ➢ Qualité des sols	• Changement des profils de drainage • Érosion et sédimentation	10.1 Éviter le plus possible les changements pouvant affecter les caractéristiques d'infiltration et de ruissellement et maintenir un bon drainage de surface pour limiter le ruissellement direct dans les eaux de surface. 10.2 Éviter le plus possible l'application de couches de scellement par temps pluvieux. Procéder uniquement sur des surfaces sèches et jamais avant (dans les 24 heures précédant) ou durant un épisode de pluie. En cas de chute de pluie imprévue, veiller à ce que les eaux de ruissellement provenant des surfaces qui viennent de recevoir la couche de scellement ne puissent pénétrer dans les eaux de surface. 10.3 Veiller à ce que le remblayage soit effectué à l'aide de matériaux adéquats exempts de glace et de sols gelés; veiller à ce que la compaction du sol soit faite comme il se doit afin d'éviter l'affaissement de celui-ci (enfoncement ou effondrement); procéder à un remblayage supplémentaire si un affaissement s'est produit. 10.4 Dans les zones où le niveau de la nappe phréatique est élevé, veiller à ce que les sols susceptibles de se soulever sous l'effet du gel (allant généralement du sable fin aux sols limoneux) ne soient pas utilisés comme matériau de remblayage. Racler soigneusement les côtés de tout moellon existant avant de placer le matériau support; toutes les roches ou les souches enlevées doivent être réinstallées dans la zone à une profondeur d'eau similaire. 10.5 Pour les revêtements de pierres inclinés, établir une pente ne dépassant pas 2 : 1 (horizontal : vertical). 10.6 Minimiser les changements apportés à la surface du sol qui affectent les caractéristiques d'infiltration et de ruissellement de celui-ci. Prévenir le soulèvement du sol par le gel dégel en préparant le sol pour la période hivernale en isolant le sol par des mesures de contrôle d'érosion et de sédiments appropriés afin de limiter l'étendue des sols exposés sur le site. Une des mesures les plus efficaces pour protéger le sol est la couverture végétale.	Négligeable, temporaire et localisé

Composantes des travaux	Composantes valorisées	Description des impacts	Mesures d'atténuation des impacts	Importance des impacts résiduels
11. Scarification	Qualité des sols ➢ Flore	• Érosion et sédimentation • Endommagement de la flore	11.1Le lit de semence sera scarifié à la main ou, avec l'approbation du personnel désigné de l'APC, à l'aide de machineries sur les grandes surfaces lorsqu'elles sont accessibles et appropriées. 11.2Le lit de semence sera scarifié si l'ensemencement a lieu plus de 7 jours après le nivellement de finissage ou s'il a plu entre l'opération de nivellement et la date d'ensemencement. 11.3Disposer les marques des lames à angles droits sur les terrains en pente afin de couvrir la graine et les sédiments et de réduire l'érosion. 11.4Régler le scarificateur afin que les couteaux ne pénètrent que d'environ 1 cm dans le sol. S'ils pénètrent trop profondément, ils vont endommager un trop grand nombre de racines.	Négligeable, temporaire et localisé
12. Gestion et disposition des déchets hors site : - matériaux de construction - matières dangereuses - eaux de nettoyage - etc.	➢ Qualité de l'eau, de l'air, des sols ➢ Faune et flore ➢ Services écosystémiques	• Modification de l'habitat faunique et floristique • Diminution des services écosystémiques • Contamination de l'air, l'eau et sol par des résidus de nettoyage, les déchets et les MDR	*Eaux de nettoyage* 12.1S'assurer que les eaux usées générées lors des travaux soient confinées et récupérées. Si un système de traitement (bassin de sédimentation portatif, filtres ou autres installations de ce genre) doit être utilisé, celui-ci doit empêcher les contaminants et les particules susceptibles de se déposer dans les réseaux et de ruisseler vers les égouts. Utiliser les moyens nécessaires pour définir le mode d'élimination des sédiments captés, des eaux résiduaires, et pour s'assurer de respecter les normes de rejet applicables, comme le Règlement 2008-47 de la CMM pour les rejets aux égouts. Il sera de la responsabilité de l'entrepreneur de démontrer le respect de ces normes. 12.2Si les eaux ne sont pas conformes aux normes applicables et ne peuvent être traitées sur place, elles devront être récupérées dans des conteneurs étanches et transportées dans un lieu autorisé par le MDDELCC. 12.3Les eaux de lavage des bétonnières doivent être collectées dans un bassin étanche aménagé de manière à éviter tout écoulement dans l'environnement. 12.4Les eaux de lavage peuvent être prises en charge par le fournisseur de béton et ramenées à l'usine de béton pour disposition. Dans le cas contraire, ces eaux doivent être confinées, échantillonnées et traitées. *Matières résiduelles dangereuses et matières résiduelles non dangereuses* 12.5Respecter toutes lois, règlements, normes et mesures préventives de santé et sécurité relatifs au cadenassage, à l'entreposage, à l'affichage, à la communication, à l'entretien de la zone d'entreposage, à la manipulation et à la disposition spécifiques aux matières dangereuses présentes sur le chantier. 12.6Conserver dans un véhicule, un bâtiment sécurisé ou des contenants à l'épreuve de la faune, tous les produits susceptibles d'attirer les animaux (p. ex. produits pétroliers, aliments, contenants de boissons recyclables et déchets). Si c'est possible, conserver les déchets alimentaires séparément des débris de construction et les éliminer quotidiennement. 12.7Répertorier et trier toutes les substances dangereuses ou toxiques (bardeaux bitumés, débris de béton, bois traité à la créosote, amiante, peinture au plomb, moisissures, excréments d'animaux, peinture, produits automobiles, équipement électrique) ainsi que tous les polluants comme l'essence et les solvants sur le site des travaux. Les manipuler, entreposer et en disposer conformément à la *Loi canadienne sur la protection de l'environnement* (LCPE), à la *Loi de 1992 sur le transport des marchandises dangereuses*, au SIMDUT et à toutes autres lois, règlements et normes applicables. 12.8Confiner et stabiliser les matières résiduelles non dangereuses à au moins 30 mètres du canal et à l'aire d'entreposage désignée et autorisée à la mesure 1.3. 12.9Éliminer hors du chantier toutes les matières résiduelles non dangereuses et fournir suffisamment de conteneurs pour entreposer les déchets domestiques sur une base journalière. 12.10 Récupérer les résidus solides provenant du lavage du matériel de construction et en disposer de manière appropriée. 12.11 Entretenir régulièrement les installations sanitaires portatives et éliminer les déchets accumulés dans une installation d'élimination appropriée. Les installations portatives doivent avoir une capacité suffisante et être gérées de façon à éviter que des déchets ne soient rejetés dans l'environnement récepteur. 12.12 Ne pas faire de feux, ni brûler ou enterrer des déchets de construction, des substances dangereuses ou toute matière (p. ex. plastique).	Négligeable, temporaire et localisé
13. Remise en état des lieux après la démobilisation	Qualité de l'eau Qualité des sols Faune, flore, services écosystémiques	• Érosion et sédimentation • Introduction ou propagation d'espèces exotiques envahissantes	13.1Les sols perturbés, mis à nu, les surface végétalisées et tous les éléments floristiques perturbés pendant les travaux doivent être remis en état, revégétalisés ou remplacés à l'intérieur des 15 jours suivant la fin des travaux par des méthodes approuvées par l'employé désigné de l'APC afin que le site soit laissé comme à son état initial. 13.2Les surfaces réhabilitées doivent avoir un degré de compaction et une aération correspondant à l'état initial (pré-travaux). 13.3Assurer un bon drainage des eaux de ruissellement, ce qui peut inclure le rétablissement ou l'amélioration des conditions de drainage d'origine.	Négligeable, temporaire et localisé

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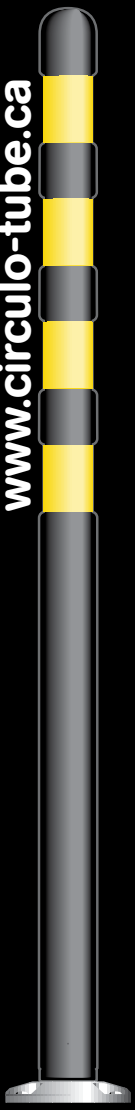

Une qualité supérieure ...

Le système dont est dotée la balise CIRCUL-O-TUBE surpasse celui de tous les autres types de repères visuels disponibles sur le marché. Il diminue les risques de blessures et de bris majeurs. Les tubes sont fabriqués en polymère de haute qualité démontrant une excellente résistance aux chocs et à l'action des rayons ultra-violets.

...En toute sécurité

La balise CIRCUL-O-TUBE représente l'avenir en matière de sécurité tant pour les cyclistes que pour les autres usagers de la voie publique et des zones de stationnement.

Elle est munie d'un système qui rend le poteau flexible à sa base et lui permet de fléchir en cas d'impact. Ce dispositif permet ainsi d'éviter des dommages matériels majeurs aux véhicules, aux cyclistes et assure la longévité du repère visuel.

Une balise hors pair!

La balise circul-o-tube vous procure une meilleure gestion du partage de la voie publique entre les cyclistes et les automobilistes. Elle a été conçue dans le but d'assurer la plus grande sécurité aux cyclistes et de permettre aux automobilistes de bien percevoir la voie cyclable, le jour comme la nuit. En effet, des bandes réfléchissantes, conformes aux normes, rendent la balise très visible la nuit.

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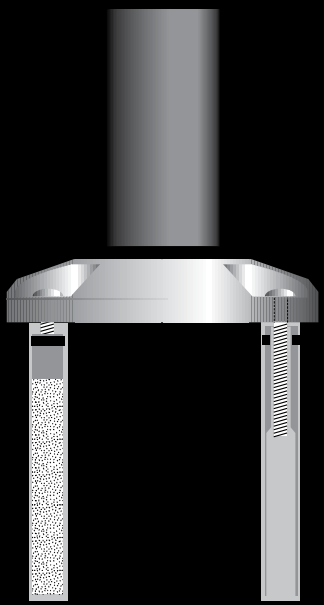
La balise circul-o-tube est principalement utilisée pour délimiter les zones de circulation prescrites. Fait à remarquer, la balise a été conçue de façon à permettre aux véhicules autorisés de la franchir sans risque de dommages. La balise circul-o-tube diminue ainsi l'usage fréquent des barrières. Des milliers de balises circul-o-tube ont été installées avec confiance un peupartout au Québec, aussi bien qu'à l'extérieur de la province. Les résultats sont étonnants!

Système de fixation

Le système de fixation de la balise circul-o-tube est conçu pour être aussi efficace sur les revêtement d'asphalte que sur le ciment.

La méthode de fixation rend possible l'enlèvement des balises au besoin, ou à la fin de la saison estivale, tout en offrant une bonne résistance au vandalisme.



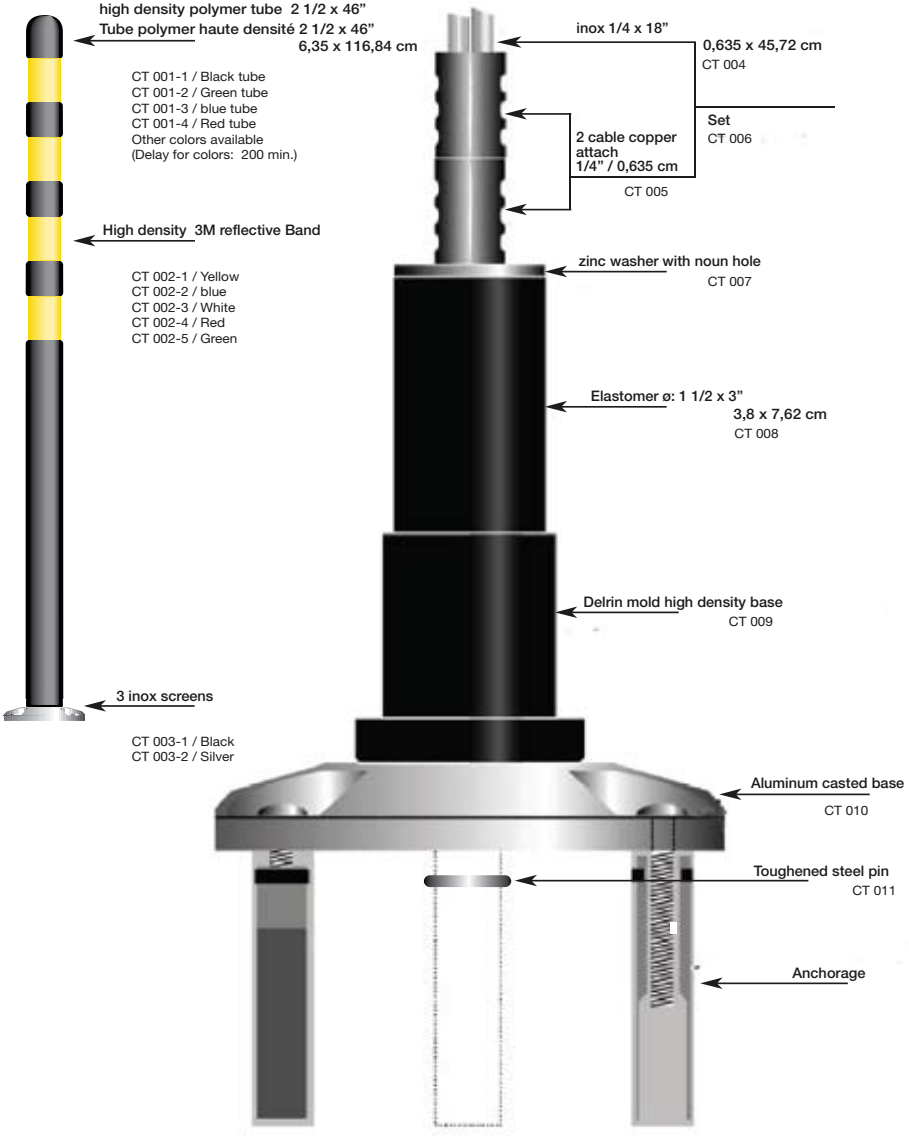
Le procédé d'installation est simple et rapide. Après avoir foré un trou d'un diamètre correspondant à celui de l'insertion (ciment ou asphalte), on y injecte l'adhésif requis et on insère la cheville filetée. L'adhésif durcit en dedans de 30 minutes pour former un lien aussi robuste que le matériel de base dans lequel il est fixé.

Installation simple en 4 étapes rapides

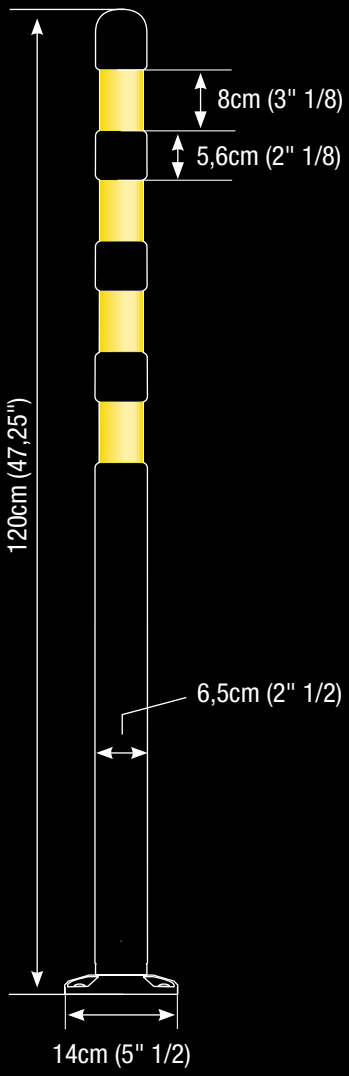
1) Forage des 3 ttrous d'un diamètre correspondant à celui de l'insertion (ciment et asphalte);
2) Injection de l'adhésif adéquat selon le revêtement;
3) Insertion des chevilles filetées;
4) Adaptation des fixations aux chevilles filetées.

Options:

Couleur de la balise (commande spéciale).
Couleur des bandes réfléchissantes.
Inscription personnalisée, logo ou emblème officiel sur bande réfléchissante



Fiche technique



CIRCULO-O-TUBE Inc.
2057, ave Branly
Québec (Quebec) G1N4 C7
Tél.: (418) 683-5432 / 1 800 834-6694
Télec.: (418) 683-7020 / 1 800 834-6695
www.circulo-tube.ca