PARKS CANADA AGENCY

Major rehabilitation of section 1 of road 132 in Forillon National Park

N/Réf. client : PRO-000212

ISSUED FOR TENDER

TECHNICAL SPECIFICATIONS

CIVIL

April 17th, 2014
N/Réf. : 056-P-0004134-0310-VR-S-0001-00

DESSAU

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PARKS CANADA

Major repair of section 1 on Route 132 in Forillon National Park

TECHNICAL SPECIFICATIONS

CIVIL

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RECORD OF REVISION AND EMISSION		
Revision no	**Date**	**Description of change and / or the issuance**
00	2014-04-17	Issued for tender

April 17th, 2014
N/Réf. : 056-P-0004134-0310-VR-S-0001-00

LISTE DES SECTIONS

SECTION A: TECHNICAL SPECIFICATIONS

Rev. 00: Issued for Tender (2014-04-17)

END OF SECTION

LIST OF DRAWINGS

CIVIL

Drawing no.	Title		Rev.
P0004134310ITD_01	Title page		00
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P0004134310ITD_03	Roadway rehabilitation – Profile 0+447 @ 1+200		00
P0004134310ITD_04	Roadway rehabilitation – Plan view 1+200 @ 1+800		00
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P0004134310ITD_10	Roadway rehabilitation – Parking lot "Les Crêtes"		00
P0004134310ITD_11	Roadway rehabilitation – Section and details		00
P0004134310ITD_12	Rehabilitation of culvert #5 (PR-2+085)		00
P0004134310ITD_13	Repair of culverts : Culvert #4 (PR-2+903), culvert #7 (PR-0+815)		00
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ENDOF SECTION

SECTION A : TECHNICAL SPECIFICATIONS

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

1.2 SCHEDULE OF WORK

.1 Works must be carried out from Monday to Friday between 06:00 and 18:00. Work may be permitted upon request two (2) weeks in advance, during some weekends depending on the reasons and request justifications.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 The work covered by this contract and concerning pavement rehabilitation of section 1 in Forillon National Park include without limitation;

- .1 Rehabilitation of existing road between chaining shown on the plans, including the removal of pavement and granular base shown on the plans, the reconstruction of the granular base, pavement and shoulders;
- .2 Removal and disposal of existing guardrails and the furniture and upgrading of flexible guardrails;
- .3 Pavement marking;
- .4 Removal and reinstallation of the existing vertical signage;
- .5 Replacement of an existing culvert including the removal and disposal of the existing culvert and providing a reinforced concrete culvert including their precast concrete head walls;
- .6 Repair of existing culverts, including land clearing, cracks injection and concrete repair;
- .7 Excavations required for the works installation;
- .8 The backfilling of excavations and compaction such as details on plans;
- .9 Cleaning existing ditches, if required;
- .10 Reshaping of existing ditches, if required;
- .11 Stone protections including geotextile;
- .12 All resurfacing;
- .13 Environmental measures for work streams;
- .14 Cleaning and maintenance of the road during construction.

1.4 CONTRACT METHOD

.1 Works must be a single lump sum contract price for each culvert and at unit price for road elements shown in the 01 29 00 – Payments section and depending on the items presented on the bid form.

1.5 WORK BY OTHERS

.1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from the Ministerial Representative.

.2 Co-ordinate works with those of other Contractors. If any part of work under this Contract depends for its proper execution or result upon work of another Contractor, report promptly to the Ministerial Representative, in writing, any defects which may interfere with proper execution of Work.

1.6 SCHEDULING

.1 At the kick-off meeting of the project, submit to the Work Supervisor the facility development site plan for approval.

.1 In the following five (5) days of delivery of facility development site plan, the Supervisor shall provide the Contractor a revised copy thereof, together with comments, if any.

.2 Within five (5) days following the acceptance of facility development site plan, the Contractor shall complete the implementation of the construction trailers.

.2 At the kick-off meeting, submit to the Work Supervisor the schedule of major repair of section 1 on Route 132 in Forillon National Park.

.3 At the kick-off meeting, submit to the Work Supervisor temporary signage boards on the traffic management during the works.

1.7 WORK EXECUTION

.1 By accepting this agreement, assume all the responsibilities normally assigned to the master work, according to health and safety law. Before starting the work, proceed to the following activities:

.1 Provide the Work Supervisor a safe work planning and a mechanical inspection certificate for each piece of machinery used on site.

.2 Ensure that workers on the site received training and information necessary in order to work safely and that all tools and protective equipment required are available, compliant with the standards, laws and regulations.

.3 Comply at all times with the provisions of the health and safety Act and the Safety Code for the construction.

.4 Inform your employees of their right to refuse work that is dangerous to their health or safety.

.5 Incident scheduled, take all necessary steps, including stopping work to protect the health and safety of workers and the public, and immediately contact the Representative of Parks Canada.

1.8 CONTRACTOR USE OF PREMISES

.1 The operational seasons of Forillon National Park are:

.1 Spring intermediate season: from first weekend of June to the end of National Holiday weekend;

.2 High season: from National Holiday weekend to Labor Day weekend;

.3 Fall intermediate season: from Labor Day weekend to Thanksgiving Holiday weekend.

.2 The use of the premises is restricted to necessary areas for the execution of the work and access to allow occupation by the Owner;

.3 Coordinate the use of the premises as directed by the Ministerial Representative and foresee a place where the Contractor may establish its trailer / site installations;

.4 The Contractor shall limit deforestation as possible, and adapt its working methods and machinery in this sense, all as directed by the Ministerial Representative;

.5 Provide an open path to traffic during the culvert replacement work. The Contractor shall provide in its working methods limiting trench openings, provide a safe and temporary retaining wall, and provide the traffic maintenance for the construction of culverts and the road rehabilitation.

.6 The Contractor shall store its equipment, supplies and materials within the land included in the work area in accordance with applicable regulations (demarcation, signage, access, margin and security clearance, etc.) in order to always allow at least one alternating traffic. In high season, parking areas and daytime areas of Forillon National Park cannot be used by the Contractor. Outside the high season, parts of parking areas or daytime areas may be used upon request two (2) weeks in advance and with justifications. Areas used, if any, shall be fenced and reported. The Contractor shall be responsible for documenting the premises before work and put the land in condition after.

.7 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.

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

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

.10 At completion of operations condition of existing work: equal to or better than that which existed before new work started.

1.9 OWNER OCCUPANCY

.1 Owner will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.10 EXISTING SERVICES

.1 The Contractor shall protect and support existing public utilities, cables, underground concrete structures, electric and telephone poles. The Contractor shall be liable for breach of existing structures and will replace at its own costs.

.2 Provide alternative routes for personnel and vehicular traffic considering of public utility services to support and protect.

.3 Establish location and extent of service lines in area of work before starting Work. Notify the Supervisor.

.4 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

.5 Where unknown services are encountered, immediately advise the Ministerial Representative and confirm findings in writing.

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

.7 Record locations of maintained, re-routed and abandoned service lines.

1.11 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each document as follows:

.1 Contract Drawings;
.2 Specifications;
.3 Addenda;
.4 Reviewed shop drawings;
.5 List of outstanding shop drawings;
.6 Change orders;
.7 Other modifications to contract;
.8 Field test reports;
.9 Copy of approved work schedule;
.10 Health and safety plan and other safety related documents;
.11 Other documents as specified.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Conventions between the Owner and the Contractor.

1.2 PAYMENT

.1 Method of Payment:

.1 The supply of materials, labour, tools, equipment, protection, transportation, customs, administrative costs, profits, financing, etc. necessary to perform the work of this contract are included in each of the items described below, unless otherwise indicated.

.2 For payment, the materials actually incorporated into the work and accepted by the Ministerial Representative will not be taken into account.

.3 Different items presented on the Bid Form are:

.1 Site Organization: The price in the Bid form is an overall lump sum price to offset all costs incurred for the facilities required for performance of the Work and for any costs not covered in other payment items in the Bid Form in accordance with the specifications. The price includes, but is not limited to:

.1 Everything described in Section 01 52 00 CONSTRUCTION FACILITIES such as site offices, access roads, platforms, ramps, barges, sanitary facilities, site fences, electricity, water, site lighting, furnishings, telephony and other communications services (Internet, pagers, fax, etc.), heating and ventilation for site offices and storage area, scaffolding, insurance, mobilization/demobilization, dust control liquid and as directed by the Ministerial Representative.

.2 Everything described in Section 01 74 11 Cleaning.

.3 Coordination with City of Gaspe, MTQ and other stakeholders, including all permits required for performance of Work.

.4 Maintenance of site and site accesses.

.5 Anything required in the following sections that is not directly attributed to or associated with a payment item in the Bid Form:

Section 01 31 19 – Project Meeting

Section 01 35 29 – Health and Safety

Section 01 52 00 – Construction Facilities

Section 01 74 11 – Cleaning

Section 0174 21 – Construction/demolition Waste Management and Disposal

.6 Surveying, staking and survey not attributed to any other payment item in the Bid Form.

.7 Site security (if applicable).

.8 Rental costs for land or space to store materials.

.9 Protection of existing public utilities for the duration of the Work and environmental control.

.10 20% of the total bid price for this item shall be paid with the first progress payment once the Work has begun.

.11 Other progress payments under this item shall be paid at each payment request at a percentage that is consistent with the overall progress of the Work corresponding to the request.

.2 Preparatory Works:

.1 Site Preparation

.1 Site preparation is measured and paid per hectare (ha) in accordance with the limits of the work indicated in the plans and specifications. Site preparation includes, without limitation, grubbing; stripping and setting aside of vegetative cover, removal and disposal of debris, loading, transportation, cleaning wood chips and disposal of non-recoverable materials.

.2 Removal of Existing Road Pavement

.1 The removal of pavement is paid per square meter (m^2) and includes, without limitation, sawing, loading, transportation, and off-site disposal.

.3 Removal and Disposal of Existing Flexible Guardrails

.1 The removal and disposal of existing flexible guardrails is paid per linear meter (m) of rail removed.

.4 Removal, Disposal, and Replacement of Existing Road Signs

.1 Removal, disposal, and replacement of existing road signs is measured and paid by the unit. The price includes, without limitation, the survey of existing signs in the work area, removing and replacing signs, removal and disposal off-site media at an authorized site, loading, and transportation of the material.

.5 Excavation 1st Class

.1 Excavation 1st Class is measured and paid per cubic meter (m^3) of excavated material. The amount includes, but is not limited to, the following: mechanical fragmentation of the materials to excavate, loading, transport, disposal of the materials offsite if authorized, transport and disposal of the

materials into a site approved by the Ministerial Representative. The contractor can use blasting equipment with the written approbation from the Ministerial Representative. Contractor must take into account that additional costs for use of blasting equipment are not paid.

.6 Excavation 2nd Class

.1 Excavation 2nd Class is measured and paid per cubic meter (m³) of excavated material, amount includes, but is not limited to, the mobilization of labor, tools, and equipment required to carry out the work, the excavation of granular materials that are not 1st Class, transport and disposal of the materials into a site approved by the Ministerial Representative;

.2 Cleaning and Reshaping Ditches

.1 The cleaning of ditches is measured and paid per cubic meter (m³) in the 2nd Class Excavated Material item in the Bid Form and includes the removal of all debris from ditches causing problems to the natural flow of water.

.2 Reshaping ditches measured and paid per cubic meter (m³) in the 2nd Class Excavated Material item in the Bid Form and includes excavation to at least 300 mm below the infrastructure, according to the profiles shown on the drawings.

.3 Transportation, loading, and disposal of surplus or non-reusable excavated materials will not be measured for payment, but will be considered an integral part of the work of cleaning ditches.

.7 Rock Removal and MG-20 Stone Backfill

.1 Removal of blocks of rock and MG-20 stone backfill is measured and paid per cubic meter (m³) and includes, without limitation, the manipulations necessary for the removal of these soils as described in section 2.5, filling of the excavation, compaction of granular materials, crushed MG-20 Stone, loading, transportation, and disposal outside the work boundaries to a site authorized by the Ministerial Representative.

.8 Environmental Protection Measures

.1 Environmental Protection Measures is a fixed lump sum amount. The amount includes all necessary expenses, material, workforce and measures to protect the environment in accordance with the environmental specifications, laws,

standards and requirements. The price includes the implementation and dismantling of measures, transportation, loading, off-site disposal of waste materials at an authorized site, restoration of the site, and the addition or repetition of measures according to the requirements of the Ministerial Representative.

.9 Section 2 Soil Consolidation Measures

.1 Compaction plates including piezometers, layer indicators, and lateral moving indicator are paid by the unit, according to Section 31 23 11, to the geotechnical report of section 2 and include installation, transportation, loading, labor, equipment and hardware, removal of measurement element and any incidental expenses.

.3 Road Works

.1 Infrastructure Preparation:

.1 Infrastructure preparation is measured and paid per square meter (m²) as indicated on plans and specifications and includes backfill up to the infrastructure levels indicated on the drawings. The installation must include the grading required by the drawings, the required compaction, and soil stability and drying, as well as any incidental expenses.

.2 Crushed MG-112 Stone Subgrade:

.1 Measure granular base in square meters (m²) of materials installed according to the areas of work indicated in the plans and specifications. The installation must include grading required according to the drawings and the required compaction.

.3 Crushed MG-20 Stone Upper Foundation:

.1 Measure the upper layer of crushed MG-20 stone foundation in square meters (m²) of materials put in place according to the areas of work indicated on the plans and specifications. The installation must include grading as required by the drawings and the required compaction.

.4 Granular Surface Preparation

.1 Preparation of the granular surface is measured and paid per square meter (m²) and includes the earthworks necessary to obtain an adequate platform for receiving granular foundations for the road works, compaction, loading, transport, and disposal at a site in accordance with the guidelines of the Ministerial Representative, and any incidental expenses.

.5 Asphalt Concrete:

.1 Base Layer 60 mm Thick Type ESG-14:

.1 Measure asphalt concrete pavement, single layer ESG-14, in square meters (m²) of asphalt concrete included in the work.

.2 Surface Layer 40 mm Thick Type ESG-10:

.3 Measure asphalt concrete pavement, surface layer ESG-10, in square meters (m²) of asphalt included in the work.

.6 Bonding Asphalt:

.1 Measure bonding asphalt in square meters (m²) of asphalt emulsion diluted and put in place, unless otherwise stated by the manufacturer, when the temperature of the ambient air is higher than 10 ºC.

.7 Crushed MG-20b Stone Shoulder:

.1 Measure crushed stone MG-20b, for the shoulders, in metric tons (T) of material put in place. The price includes loading, transportation, and all incidental expenses.

.8 Stone Sub-Foundation Cross Drain

.1 Cross drains of the stone sub-foundation are measured and paid per square meter (m²) and include transportation, loading, compaction, and all incidental expenses.

.9 Topsoil and Finishing Grading

.1 Measure topsoil and finishing grading in square meters (m²) of actual area determined by the Ministerial Representative.

.10 Type H-3 Hydroseeding (slope greater than 1V:3H ratio):

.1 Measure hydroseeding in square meters (m²) of actual area planted along the slopes of the terrain. The hydroseeding includes the mixture selected by Ministerial Representative, including fertilizers, mulches, adhesives, and erosion control cover.

.11 Guardrail:

.1 Measure in linear meters (m) the supply and installation of guardrails on the side of a road, including necessary poles and hardware parts depending on the number of meters of rails actually installed. The measurement shall be made from the outer ends of the rails and should take account of sections used for anchoring and end sections.

.2 End devices are paid by the unit and include the supply, transportation, installation, and any incidental expenses.

.12 Posts for Small Signage

.1 Posts for small signs are measured and paid by the unit and include the loading, transport, installation, anchors, and hardware required, and any incidental expenses.

.13 Pavement Marking:

.1 Pavement markings, including the scattering of reflective glass beads and the pre-marking, will be measured in linear meters (m) of continuous lines. Marking of dashed lines, hatches, stop lines, arrows, pedestrian crossings, and parking areas shall be measured per linear meter (m) of continuous lines, empty spaces excluded.

.14 Tree Planting

.1 Tree planting is measured and paid by the unit, according to Section 32 93 10 and any incidental expenses.

.15 Installation of Small Road Signs

.1 The supply, installation, and painting of small signage panels are measured and paid by the unit, according to complete panels installed. The price includes transportation, hardware, and any incidental expenses.

.4 Structures:

.1 Rip-rap

.1 Rip-rap will be measured by the square meter. Payment will be made according to the unit price bid for corresponding grade and thickness. Rip-rap grade can be expressed by size or by weight. Unit price shall include loading, transportation, placing, all labour, equipment, stone washing, excavation, disposal of waste material, geotextile membrane type V, installation, and any incidental expenses necessary to complete the Work according to the specifications of Section 33 31 00 – Culverts.

.2 Concrete Repairs (without finishing stock)

.1 Concrete repairs are paid per square meter (m²) of area to repair, in accordance with the requirements of the specifications and drawings and as directed by the Ministerial Representative. The amount includes, but is not limited to, the following: the supply, installation, and dismantling of required formwork; supply and installation of formwork ties; supply and application of repair mortar at formwork tie locations; substrate treatment before pouring; supply and installation of steel tie wires; supply, transportation, handling, and installation of steel elements embedded in concrete, as shown in the drawings; supply, installation, vibration, finishing, and wet curing of concrete; cleaning concrete surfaces adjacent to the pouring area; following the completion of the works, off-site disposal of the formwork materials and all materials used during the correction of faulty repairs; treatment of surplus materials in accordance with the requirements of Section 01 74 21 Construction / Demolition Waste Management and Disposal; any incidental expenses.

.3 Mobilization/Demobilization (Crack Injection)

.1 The Mobilization/demobilization of the equipment is a fixed lump sum amount. The amount includes mobilization of labour, tools, equipment and products needed to carry out the work and any incidental expenses

.4 Crack Injection

.1 Crack injection is paid per linear meter (m) of crack, in accordance with the requirements of the specifications, drawings and as directed by the Ministerial Representative. The amount includes, but is not limited to, the following: Preparation, presentation, and correction, if required, of injection technical data sheets; the cleaning of existing cracks before the injection; the treatment of surplus materials in accordance with the requirements of Section 01 74 21 Construction / Demolition Waste Management and Disposal; the installation and removal of sealing products and testing; any incidental expenses.

.5 Cofferdam (2 to 4 m high)

.1 The cofferdam is a temporary protection; no price is associated with this item. The amount is included in all the other items of the bid form.

.6 Concrete Demolition

.1 Concrete demolition is measured and paid per cubic meter (m^3), in accordance with the requirements of the specifications and drawings, and as directed by the Ministerial Representative. The amount includes, but is not limited to, the following: Preparation, presentation, and correction, if required, of the Work Plan regarding the demolition of the wall; the mobilization of labour, tools, and equipment required to carry out the work; all required saw cuts; the demolition of defective and sound concrete as directed by the Ministerial Representative; the cleaning of steel reinforcement to be conserved by sandblasting; the cleaning of concrete substrate by sandblasting; the collection and treatment of materials arising from the cleaning process as prescribed by Section 01 74 21 Construction / Demolition Waste Management and Disposal; the collection and treatment of demolition materials as prescribed by Section 01 74 21 Construction / Demolition Waste Management and Disposal; any incidental expenses.

.7 Reinforcing Steel

.1 Reinforcing Steel is paid per kilogram (kg), in accordance with the requirements of the specifications and drawings and as directed by the Ministerial Representative. The amount includes, but is not limited to, the following: the preparation, presentation, and correction, if required, of the Work Plan for the installation of reinforcing steel; the mobilization of labour, tools, and equipment required to carry out the work; the preparation, presentation, and correction, if required, of the reinforcement shop drawings and bill of materials; the supply and shaping of reinforcing steel; installation of required steel reinforcement; any incidental expenses.

.8 Chemical Anchors

.1 Chemical Anchors are paid per unit of chemical anchor, in accordance with the requirements of the specifications and drawings and as directed by the Ministerial Representative. The amount includes, but is not limited to, the following: the preparation, presentation, and correction, if required, of the chemical anchor shop drawings and technical data sheets; the mobilization of labour, tools, and equipment required to carry out the work; the provision, shaping, handling, transportation, and installation of reinforcement; drilling and cleaning holes for the installation of chemical anchors; supply, handling, transportation, and installation of chemical

anchors; the provision, shaping, handling, transportation, and installation of steel anchor rods; the treatment of surplus materials in accordance with the requirements of Section 01 74 21 Construction / Demolition Waste Management and Disposal; any incidental expenses.

.9 Type V-S Concrete

.1 V-S Concrete is paid per cubic meter (m³) of concrete. The amount includes, but is not limited to, the following: the supply, installation, and dismantling of required formwork; supply and installation of formwork ties; supply and application of repair mortar at formwork tie locations; substrate treatment before pouring; supply and installation of steel tie wires; supply, transportation, handling, and installation of steel elements embedded in concrete, as shown in the drawings; supply, installation, vibration, finishing, and wet curing of concrete; cleaning concrete surfaces adjacent to the pouring area; following the completion of the works, off-site disposal of the formwork materials and all materials used during the correction of faulty repairs; treatment of surplus materials in accordance with the requirements of Section 01 74 21 Construction / Demolition Waste Management and Disposal; any incidental expenses.

.10 Backfill for Rock Excavations (Type XII Concrete)

.1 Backfill for rock excavations is paid per cubic meter (m³) of Type XII concrete. The amount includes, but is not limited to, the following: the supply, installation, and dismantling of required formwork; supply and installation of formwork ties; supply and application of repair mortar at formwork tie locations; substrate treatment before pouring; supply and installation of steel tie wires; supply, transportation, handling, and installation of steel elements embedded in concrete, as shown in the drawings; supply, installation, vibration, finishing, and wet curing of concrete; cleaning concrete surfaces adjacent to the pouring area; following the completion of the works, off-site disposal of the formwork materials and all materials used during the correction of faulty repairs; treatment of surplus materials in accordance with the requirements of Section 01 74 21 Construction / Demolition Waste Management and Disposal; any incidental expenses.

.11 2nd Class Excavated Material

.1 2nd Class Excavated Material is measured and paid per cubic meter (m³) of excavated material. The amount includes, but

is not limited to: the mobilization of labor, tools, and equipment required to carry out the work, the excavation of granular materials that are not 1st Class, transport and disposal of the materials into a site approved by the Ministerial Representative;

.12 1st Class Excavated Material

.1 1st Class Excavated Material is measured and paid per cubic meter (m³) of excavated material. The amount includes, but is not limited to, the following: mechanical fragmentation of the materials to excavate, loading, transport, disposal of the materials offsite if authorized, transport and disposal of the materials into a site approved by the Ministerial Representative. The contractor can use blasting equipment with the written approbation from the Ministerial Representative. Contractor mush take into account that additional costs for use of blasting equipment are not paid.

.13 Slip Lining of a HDPE Pipe ø1520 mm, RSC 250

.1 Supply and the slip lining of a HDPE pipe, ø1520 mm, RSC 250, will be measured in linear meters (m) and payment will be made by the unit price. Unit price shall include supply of all material, equipment, tools, cleaning of the existing culverts, excavation and demolition of obstructions in the existing culverts, temporary retaining works, installation of a rails system to enable the liner pipe to slide into position, measures to prevent pipe floating during concrete works, drilling and plugging the liner pipe if requirement for concrete pumping, and incidentals necessary to complete the Work according to the specifications of the Section 33 31 01 – Culverts rehabilitation.

.14 Concrete (type XIV-C or XV) for Slip Lining Works

.1 The concrete type XIV-C or XV required for filling the void between the exterior of the liner pipe and existing culvert will be measured by cubic meter (m³) according to the dimensions indicated on the shop drawings approved by the Ministerial Representative. Payment will be made by the unit price. Unit price shall include supply and installation of formworks, supply and transportation of materials, mobilization and equipment for concrete pumping, cast-in-place concrete in lift to protect the liner HDPE pipe from excessive pressure, counterweight of the linerpipe, and any incidental expenses necessary to complete the Work according to the specifications of the Section 33 31 01 – Culverts rehabilitation.

.15 Concrete Works (type XII) for the Existing Culverts Invert

.1 The concrete type XII for filling the existing culverts invert will be measured by cubic metre (m^3) according to the dimensions indicated on the shop drawings approved by the Ministerial Representative. Payment will be made by the unit price. Unit price shall include supply and installation of formworks, supply and transportation of materials, mobilization and equipment for concrete pumping, and incidentals necessary to complete the Work according to the specifications of the Section 33 31 01 – Culverts rehabilitation.

.16 HDPE Pipe Extension, ø1520mm, RSC 250

.1 HDPE pipe, 1520 mm diameter, class RSC 250, used for the extension of the liner pipe will be measured by length in meters (m) and payment will be made by the unit price. The unit price shall include 2^{nd} class excavations, the supply and the installation of all material located from the bottom of trenches to the infrastructure, bends, flange joints, accessories, installation complying with the standard drawings III-4-007A and III-4-007B, coordination for pipe and cast-in-place concrete headwall connection, and any incidental expenses necessary to complete the Work according to the specifications of the Sections 33 31 00 – Culverts, and 33 31 01 – Culverts rehabilitation.

.17 Mobilization, Work Organization, Water Management, and Related Works (Rehabilitation Works)

.1 Payment for mobilization, work organization, water management, and related works for the rehabilitation works of the culverts #2 and #5 will be made by lump sum price. The lump sum price shall include site preparation, coordination of works in accordance with the traffic control specifications, public utility protection measures, temporary water pumping systems, temporary lighting system, temporary works for protecting site the site of work from water damage (cofferdam), temporary access roads, temporary retaining works for Contractor's needs, removal of all temporary works, site restoration, and any incidental expenses necessary to complete the Work according to the rehabilitation works specifications.

.18 Existing Culvert Removal

.1 Culvert removal will be measured by length in meters (m) and payment will be made by the unit price for corresponding pipe diameter. Unit price shall include trench digging,

temporary retaining works, pipe removal, transportation and disposal of waste material, supply of fill material, backfilling and compaction, and any incidental expenses necessary to complete the Work.

.19 Reinforced Concrete Pipe (RCP)

.1 Reinforced concrete pipes will be measured by linear meter (m) and payment will be made by the unit price for corresponding pipe diameter. Unit price shall include trench digging, supply and installation of all materials from the bottom of the trench to the infrastructure, temporary retaining works, cross slope, supply and installation of cut-off walls, supply of all materials for a complete installation according to the standard drawing III-4-002, and any incidental expenses necessary to complete the Work according to the specifications of the Section 33 31 00 – Culverts.

.20 Clay Plug or Unshrinkable Fill Plug

.1 Clay plug or unshrinkable plug will be measured by unit installed, independent of the pipe diameter for which it is required. Unit price shall include supply and installation of materials and any incidental expenses necessary to complete the Work according to the specifications of Section 33 31 00 – Culverts.

.21 Sloped Concrete End Section for Circular Culvert

.1 Sloped concrete end sections for circular culvert will be measured by the unit corresponding to the culvert diameter to which it is connected. Unit price shall include extraction, transportation, and disposal of waste material, bedding, supply and installation of all materials, and any incidental expenses necessary to complete the Work according to the specifications of the Section 33 31 00 – Culverts.

.5 Traffic Maintenance

.1 One lane of traffic must be maintained throughout the construction period. Work will be performed in alternation and circulation will be ensured by a signaler and by traffic lights to allow access to the park at all times. Maintaining the traffic flow is paid overall, provided the required supporting documents are presented to and approved by the Ministerial Representative. The price includes, but is not limited to, material, labour, equipment, signalers, reference boards, site access, signage, tags, impact attenuators, follow-ups, and required adjustments during construction, as well as any incidental expenses.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Not used

1.2 PRICE AND TERMS OF PAYMENT

.1 The costs of project meetings should be included in the bid price for each item concerned on the bid form.

1.3 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work, every two (2) weeks.

.2 The Work Supervisor prepares agenda for meetings.

.3 The Work Supervisor distributes written notice of each meeting at least four (4) days in advance of meeting date to the Contractor, the Ministerial Representative and the Consultant.

.4 Provide physical space and make arrangements for meetings.

.5 The Work Supervisor presides at meetings.

.6 The Work Supervisor records the meeting minutes. He includes significant proceedings and decisions. He identifies actions by parties.

.7 Reproduce and distribute copies of minutes within five (5) days after meetings and transmit to meeting participants and affected parties not in attendance.

.8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.4 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, the Work Supervisor requests a kick-off meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 The Ministerial Representative, the Consultant, the Work Supervisor and the Contractor and his Subcontractors will be in attendance.

.3 The Work Supervisor establishes time and location of meeting and notifies parties concerned minimum five (5) days before meeting.

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:

.1 Appointment of official representative of participants in the Work.

.2 Schedule of Work.

.3 Schedule of submission of shop drawings, samples, colour chips in accordance with 01 33 00 - Submittal Procedures section.

.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with 01 52 00 - Construction Facilities section.

.5 Delivery schedule of specified equipment, for each bridge.

.6 Site security in accordance with 01 56 00 - Temporary Barriers and Enclosures section.

.7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.

.8 Owner provided products.

.9 Record drawings in accordance with 01 33 00 - Submittal Procedures section.

.10 Take-over procedures, acceptance, warranties in accordance with 01 78 00 - Closeout Submittals section.

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

.12 Appointment of inspection and testing agencies or firms.

.13 Insurances, transcript of policies.

1.5 PROGRESS MEETINGS

.1 The Work Supervisor establishes a schedule of meetings to be held every two (2) weeks during course of the work until the completion thereof.

.2 Contractor, major Subcontractors involved in Work the Work Supervisor are to be in attendance.

.3 The Work Supervisor notifies parties minimum five (5) days prior to meetings.

.4 The Work Supervisor records minutes of meetings and circulate to attending parties and affected parties not in attendance within three (3) days after meeting.

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Health and safety.

.5 Problems which impede work schedule.

.6 Review of off-site fabrication delivery schedules.

.7 Corrective measures and procedures to regain projected schedule.

.8 Revision to work schedule.

.9 Progress schedule, during succeeding work period.

.10 Review submittal schedules of submittal procedures: acceleration of the process if needed.

.11 Maintenance of quality standards.

.12 Review proposed changes and their potential impact on the schedule and on completion date.

.13 Other business.

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 PRECEDENCE

.1 In the case of work carried out for the federal Government, the Division 1 sections take precedence over the technical sections of the other divisions of the project quotation.

1.2 DEFINITION

.1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.

.2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.

.3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.

.5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.

.6 Milestone: significant event in project, usually completion of major deliverable.

.7 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.

1.3 REQUIREMENTS

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

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

.3 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit the Ministerial Representative within five (5) working days the implementation schedule no later than 5 calendar days after notification of the contract. The implementation schedule will be used for planning and monitoring work, and for the production of progress reports.

1.5 MASTER PLAN

.1 Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT).

.2 The Ministerial Representative will review and return revised schedules within two (2) working days.

.3 Revise impractical schedule and resubmit within five (5) working days.

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

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows: non-exhaustive list:

- .1 Award,
- .2 Shop drawings, samples,
- .3 Permits,
- .4 Mobilization,
- .5 Topographic survey,
- .6 Excavation, stockpile materials to reuse and removal and disposal of existing materials,
- .7 Install culverts, head walls and other materials,
- .8 Backfill,
- .9 Finish earthwork and riprap protection,
- .10 All surfaces repairs,
- .11 Reconstruction of the road pavement and guard rails
- .12 Corrections of defects.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule every two (2) weeks reflecting activity changes and completions, as well as activities in progress.

1.8 PROJECT MEETINGS

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

.2 Weather related delays with their remedial measures will be discussed and negotiated.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOTE USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 11 00 – Summary of Work

.2 Section 01 70 12 – Safety Requirements

.3 Section 01 35 43 – Environmental Procedures

.4 Section 02 81 01 – Hazardous Materials

1.2 ADMINISTRATIVE

.1 Submit to the Ministerial Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with Work affected by submittal until 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 in SI Metric units, converted values are acceptable.

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

.6 Notify the Ministerial 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 the Ministerial Representative review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by the Ministerial 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.

.2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province.

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

.4 Allow seven (7) days for the Ministerial Representative review of each submission.

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

.6 Make changes in shop drawings as the Ministerial Representative may require, consistent with Contract Documents. When resubmitting, notify the Manager of Parks Canada (PCA) in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, containing:

- .1 Date,
- .2 Project title and number,
- .3 Contractor's name and address,
- .4 Identification and quantity of each shop drawing, product data and sample,
- .5 Other pertinent data.

.8 Submissions include:

- .1 Date and revision dates,
- .2 Project title and number,
- .3 Name and address of:
  - .1 Subcontractor,
  - .2 Supplier,
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.9 After the Ministerial Representative review, distribute copies.

.10 Submit electronic copy of shop drawings for each requirement requested in specification sections and as the Ministerial Representative may reasonably request.

.11 Submit electronic copy of test reports for requirements requested in specification sections and as requested by the Ministerial Representative.

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

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

.12 Submit electronic copy of certificates for requirements requested in specification sections and as requested by the Ministerial Representative.

.1 Documents, printed on paper of official correspondence of the manufacturer and signed by authorized official of the latter, must certify that the products, materials, equipment and systems be provided meet the requirements of the specifications.

.2 The certificates must be dated after the award of the Contract and indicate the name of the project.

.13 Delete information not applicable to project.

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

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

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

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

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

1.4 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 11 – Excavation and backfilling

.2 Section 32 11 00 – Roadworks

.3 Section 33 31 00 – Culverts

1.2 REFERENCES

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

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.3 Province of Quebec

.1 An Act Respecting Occupational Health and Safety, R.S.Q., c.S-2.1 (current edition) - Updated 2014.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within seven (7) days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

.2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.

.3 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to the Work Supervisor weekly.

.4 Submit copies of reports or directions issued by Federal, Provincial and Territorial health and safety inspectors.

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS - Material Safety Data Sheets.

.7 The Work Supervisor will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within seven (7) days after receipt of plan. Revise plan as appropriate and resubmit plan to Work Supervisor within five (5) days after receipt of comments from Work Supervisor.

.8 Work Supervisor's review of Contractor's final Health and Safety plan should not be construed as approval and does not reduce the Contractor's overall responsibility for construction Health and Safety.

.9 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to the Work Supervisor.

.10 On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

1.4 FILING OF NOTICE

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

1.5 SAFETY ASSESSMENT

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

1.6 MEETINGS

.1 Schedule and administer Health and Safety meeting with Work Supervisor prior to commencement of Work.

.2 Notify Work Supervisor of this meeting at least five (5) days in advance.

1.7 REGULATORY REQUIREMENTS

.1 Perform Work in accordance with authorities having jurisdiction over the territory of work.

1.8 GENERAL REQUIREMENTS

.1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.

.2 Work Supervisor may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.9 RESPONSIBILITY

.1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

.3 Contractor shall provide, for the entire duration of the work, signaling appropriate site for visitors.

1.10 COMPLIANCE REQUIREMENTS

.1 Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.6 Safety Code for the Construction Industry.

.2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

1.11 UNFORSEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work

in accordance with Acts and Regulations of Canada having jurisdiction and advise Work Supervisor verbally and in writing.

1.12 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:

.1 Have site-related working experience specific to activities associated with concrete repair, electrical work and paving.

.2 Have working knowledge of occupational safety and health regulations.

.3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.

.4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.

.5 Be on site during execution of Work and report directly to and be under direction of Work Supervisor.

1.13 POSTING OF DOCUMENTS

.1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Canada having jurisdiction, and in consultation with Work Supervisor.

1.14 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Work Supervisor.

.2 Provide Work Supervisor with written report of action taken to correct non-compliance of health and safety issues identified.

.3 Work Supervisor may stop Work if non-compliance of health and safety regulations is not corrected.

1.15 BLASTING

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

1.16 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from Work Supervisor.

1.17 WORK STOPPAGE

.1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

.1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humans; or degrade environment aesthetically, culturally and/or historically.

1.2 ENVIRONMENTAL PROTECTION: PREVENTION/CONTROL OF POLLUTION AND HABITAT OR ENVIRONMENT DISRUPTION DURING CONSTRUCTION

.1 In the case of work done for the federal government; sections of Division 1 have priority over the technical sections of other divisions of project specifications. The Contractor shall at all times respect the National Parks Act and Regulations Reference Standards.

1.3 PRESENCE OF WILDLIFE ON SITE

.1 To ensure the safety of workers, visitors and animals, stop traffic or machinery in the presence of wild animals on the site, especially large animals: moose, deer and black bear. Make a safe escape route to the animal and keep a safe distance. Observe from a distance, without approaching (avoid disturbing and harassing) and contact the service of Conservation park for advice or support if needed.

1.4 METHOD OF WORK

.1 Contractor must submit his method of work and sediment control plan one (1) week prior to the start of the work for approval by the Ministerial Representative.

1.5 SUMMARY ENVIRONMENTAL SOIL CHARACTERIZATION

.1 Contract must refer to "Summary environmental soil characterization" provided in appendix and implement all the required mitigation measures for each activity.

1.6 FIRES

.1 Fires and burning of rubbish is forbidden.

1.7 WASTE DISPOSAL

.1 Do not bury rubbish and waste materials on Parks Canada property.

.2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

.3 Waste must be evacuated outside the Parks Canada property while respecting regulations federal and provincial environmental protection. Waste materials also include demolition material not withhold by Parks Canada, hazardous materials (liquid and solid) and water containing suspended solids.

1.8 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep excavations and site free from water. The Contractor must obtain the authorization from the Ministerial Representative concerning the localization of the permitted reject points.

.2 Do not pump water containing suspended materials, if not previously properly filtered, into waterways, sewer or drainage systems.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances, according to local regulations.

.4 The Contractor shall keep a flow at the river downstream of the work area.

.5 The watercourse bed must regain original profile after work.

1.9 TREES, SHRUBS AND PLANT PROTECTION

.1 Protect trees, shrubs and plants on site and adjacent properties where indicated. Any plantation that the Ministerial Representative deems sufficiently damaged by the Contractor to question the plant capacity to survive, must be replaced by the Contractor, at the rate of 2 equivalent plantations for every damaged plant identified by the Ministerial Representative.

.2 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.3 Minimize stripping of topsoil and vegetation.

.4 The Contractor must remove and stockpile crop canopy for reuse before works.

.5 Restrict tree removal to areas indicated or designated by the Ministerial Representative.

.6 The Contractor shall obtain the approval of the Ministerial Representative for pruning.

.7 When plantations should be moved using a transplantation bucket, the Contractor must wrap them in a burlap bag with enough soil to contain all the roots and provide them with adequate protection. Hold the damp earth at any time. Keep away from the Sun. Replanting once the work completed at origin point or at the place indicated by the Ministerial Representative.

1.10 WORK ADJACENT TO WATERWAYS

.1 It is forbidden to extract any natural or artificial material from or nor the watercourse bed, including pumping water for site purposes.

.2 Do not dump excavated fill, waste material or debris in waterways.

.3 The Contractor sets up all necessary means (hay in bag, filter fence etc.) to eliminate any discharge from sediments in the brooks.

.4 The contractor shall determine the type of cofferdam or temporary works and method of construction and demolition, according to the characteristics of the soils encountered and watercourse to avoid environmental pollution. The design of temporary structures

(cofferdams, dikes, etc.) shall consider a flooding event of two years and an additional protection of at least 300 mm.

.5 Cofferdams materials must be clean and free from fine materials. Cofferdams constructed using fine materials are not allowed, even if they are contained in a geotextile

.6 If the construction site is isolated by cofferdams and pumping is necessary, water must be directed into a sedimentation basin (Appendix 1) or a vegetated area. The water must be pumped out of the watercourse.

.1 The sedimentation basin must be designed according to the inflow and discharge,

.2 The sedimentation basin must be built outside the shoreline of the watercourse,

.3 The sedimentation basin must be cleaned when filled to 50%,

.4 The place used for cofferdam must be left in condition at least equivalent to the existing,

.5 The natural filter must be located in a grass field, in a bog or a forest litter and distance must be sufficient so that the water that returns to the watercourse does not create a sediment plume.

.7 The pumps must be fitted to prevent the fish from getting into the pumping system.

.8 Traffic is forbidden in watercourse. Design and construct temporary crossings to minimize erosion to waterways.

.9 Do not skid logs or construction materials across waterways.

.10 Work is not allowed in recognized watercourse as fish habitat between September 16 and May 31 inclusive.

.11 Do not blast under water or within 500 m of indicated spawning beds.

.12 Watercourse recognized as a fish habitat cannot be blocked for more than 10 consecutive days.

1.11 POLLUTION PREVENTION

.1 Maintain temporary erosion and pollution control features installed under this Contract.

.2 Control emissions from equipment and plant in accordance with local authorities' emission requirements.

.3 Idling of vehicles is forbidden unless special permission from the Ministerial Representative.

.4 Provide temporary enclosures to prevent sandblansting and other extraneous materials from contaminating air beyond application area.

.5 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.12 WATER AND SOIL POLLUTION PREVENTION

.1 The Contractor and subcontractors who perform work requiring the use of motorized equipment, fuel transfer or using hazardous products, must know and implement

procedures to be followed in case of spills. This procedure should be displayed at the sight of employees at the work site.

.2 The Contractor shall ensure that machinery, tooling, and equipment that will be used for the execution of the work, are safe, clean and in good working condition. The Ministerial Representative reserves the right to deny access or to expel the construction machinery, tooling and equipment that do not meet these requirements. Visibly badly maintained equipment and presenting evidence of leaks or the risk of leaks will be returned at the expense of the Contractor or the owner of the equipment, without charge to Parks Canada. Furthermore, the machinery allowed to traffic or work at less than 30 m from a watercourse, must use biodegradable vegetable oil.

.3 If the Contractor must store hazardous materials and hydrocarbons, for the purposes of the project, there will be on-site retention tanks storage.

.4 General maintenance, refueling and cleaning of equipment must be done at more than 30 m from the watercourse.

.5 The Contractor shall have on site an emergency kit in order to respond to events requiring environmental emergency.

.6 Without limitation, this kit of intervention must include and gather a minimum of equipment and devices to contain any spills to minimize the risk of contamination spreading caused by an oil spill, hazardous products or other contaminants. This intervention package identified EMERGENCY - ENVIRONMENT must contain:

.1 An absorbent bead of 3 inches in diameter, length of 12 feet;

.2 An absorbent bead of 3 inches in diameter, length of 4 feet;

.3 Twenty-five layers of absorbent;

.4 Two bags of 7 litres absorbent (Sphagnum moss Type);

.5 An epoxy stick.

.6 Two DANGER warning posters;

.7 Three recovery plastic bags;

.8 Stickers TDG (transport of dangerous goods) class 4.1;

.9 An indelible marker;

.10 Two pairs of rubber gloves;

.11 Two pairs of protective eyewear;

.12 Tape type 'Duct Tape';

.13 A few tools: pliers and screwdrivers;

.14 Declaration forms "Environmental incident report" from the garrison, provided by the Representative of Parks Canada.

.7 Intercept runoff from off-site construction and maintain the waters off site by routing them to facilities or stabilized areas.

.8 Drain off from the construction site runoff by sending to the approved facilities that promote sedimentation before they reach a water body.

.9 Provide temporary protection to prevent soil loss caused by rain and snow melt.

.10 Provide plans based on to the head of drainage, soil stability and development of the site.

.11 The sediment barriers (straw bales or silt fences) are installed to keep the sediment within the boundaries of the site and avoid that sediments reach the water body.

.1 The filter straw bale is constructed using straw bales tightly assembled and anchored in a trench (Appendix 2). The trench for receiving straw bales must be dug at the base of a slope following the contours so that the barrier intercepts the runoff. The bales must be carefully stuck in the trench so that they are properly nested in it,

.2 The silt fence consists of geotextile, for this purpose, supported by wooden posts (Appendix 3). At base, the geotextile is well embedded in the ground to ensure efficiency,

.12 The sediment trap and filter berm are generally matched and installed in a ditch (Appendix 4). The hatch is a cavity carved into the ditch to slow the flow and allow sediment deposition. The berm is a temporary gravel ridge or crushed stone which dissipates the energy of the water flowing in the ditch. When the sediment trap is 50% filled, it must be emptied and, where necessary, the filter must be cleaned or replaced.

.13 Temporary facilities in damp environment are prohibited. In addition, soil conditions and drainage must be maintained.

.14 Limit the areas to be stripped in order to avoid erosion. At the end of each working day, the Contractor shall protect with membranes or sediment fences, any exposed surface vulnerable to erosion and may produce sediment to a water body or to a ditch discharging into a hydric environment.

1.13 PROCEDURES IN CASE OF SPILL, HAZARDOUS MATERIALS OR OTHER CONTAMINANT

.1 In the event of a spill, the intervention and cleaning operations of the spill must be carried out by the Contractor in accordance with the following procedure:

.1 Ensure the safety of people and immediately retrieve the spill.

.2 If the Contractor is unable to contain or to immediately recover the spill or spill occurs in water, it should notify, depending on the affected area:

.1 Local fire (9-1-1) Service

.3 The Contractor must immediately report the spill (whatever the amount) to the Ministerial Representative as well as to the environment officer and prepare and submit to the Ministerial Representative, the intervention report provided by the Ministerial Representative.

.4 The Contractor liable for any spill of product deemed harmful to the environment or property of Parks Canada, and if applicable, the Contractor shall execute immediately, at its expense, the corrective measures prescribed by the Ministerial Representative or environment officer.

.5 Failing to intervene adequately and to the satisfaction of Parks Canada because of the size or the type of spill, the cost of complementary interventions that require staff or machinery of Parks Canada, will be brought to the responsibility of Contractor.

.6 Intervention report: in case of intervention the Contractor shall complete without delay the event declaration (environmental incident report, provided by Ministerial Representative), and submit it to the Ministerial Representative.

.2 This document will be presented at the preliminary meeting before the start of the work.

1.14 HAZARDOUS PRODUCTS TEMPORARY STORAGE

.1 Hazardous products must be collected into blocks separated by a horizontal distance of 1 m. Incompatible products must be separated by a horizontal distance of 3 m. The blocks shall be located at least 30 m from a trees/shrubs lines and at least 6 m from a grass/herbaceous covered surface.

.2 Safety distances must be observed 30 m from watercourses, 15 m of tents and 3 m of fuel equipment and roads. Access must be provided to emergency responders.

.3 Portable tanks must meet road standards. During the transfer of fuel, fuel tank must be grounded. The vehicle being refuelled or tank must be connected to the tank truck, cable grounding, in ensuring that contact is established on bare metal.

.4 Storage areas are equipped with a system of retention or capture of liquids (Polyspill pallets, Bowl, waterproof coatings, donkey, trenches, drains blocked or connected to a recovery system). Rainwater is drained regularly or the storage area is protected to avoid the accumulation of rainwater.

.5 Containers for flammable and combustible liquids must be stored in an upright position.

.6 Containers in poor condition, should be immediately disposed outside the Parks Canada territory, in accordance with the most stringent environmental standards. Containers should be identified according to WHMIS.

.7 The dangerous materials temporary storage must indicate risks with the TDG (transport of dangerous goods) placard-boards.

1.15 NON-COMPLIANCE NOTICE

.1 A non-compliance notice will be issued in writing to the Contractor by the Ministerial Representative whenever Contractor doesn't comply with a law, a regulation or a provincial or municipal permit, or any other item of the Environmental Plan protection implemented by the Contractor.

.2 Upon receipt of a notice of non-compliance, the Contractor shall propose corrective measures to the Ministerial Representative, who approves or not the Contractor proposal.

.3 The Contractor shall obtain the written approval of the Ministerial Representative prior to the implementation of the proposed measures.

.4 The Ministerial Representative will order cessation of work until satisfactory corrective action.

.5 No extra time and no adjustment will be accorded to the work stoppage.

Part 2 Products

2.1 NOT USED

.1 Not Used.

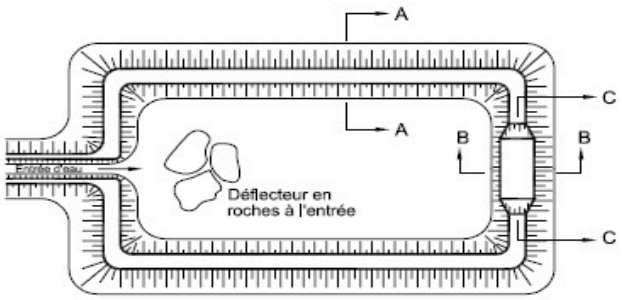
Part 3 Execution

3.1 NOT USED

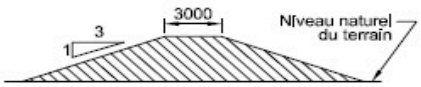
.1 Not Used.

Appendix 1

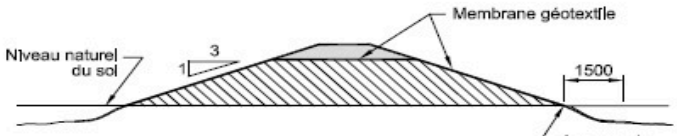
Sedimentation Bassin



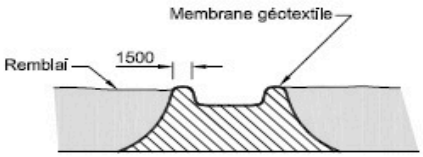
Bassin de sédimentation



COUPE A-A



COUPE B-B



COUPE C-C

Déversoir sortie d'eau en pierre

Notes :

- cet ouvrage doit être planifié et prévu dans les plans et devis;
- l'emprise nécessaire à son installation doit être prévue et acquise à cette fin, le cas échéant.

Figure 9.4–4
Bassin de sédimentation

Appendix 2

Filter straw bale

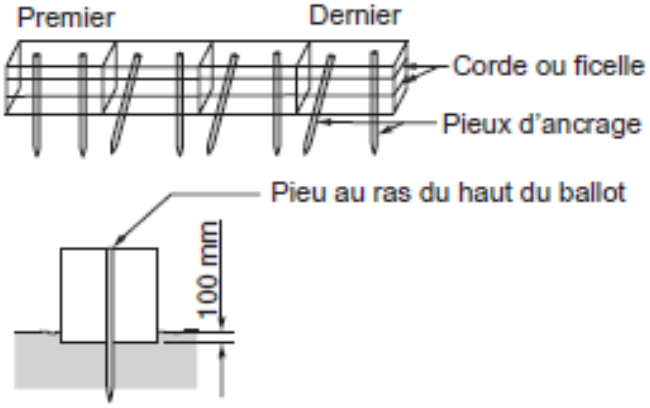
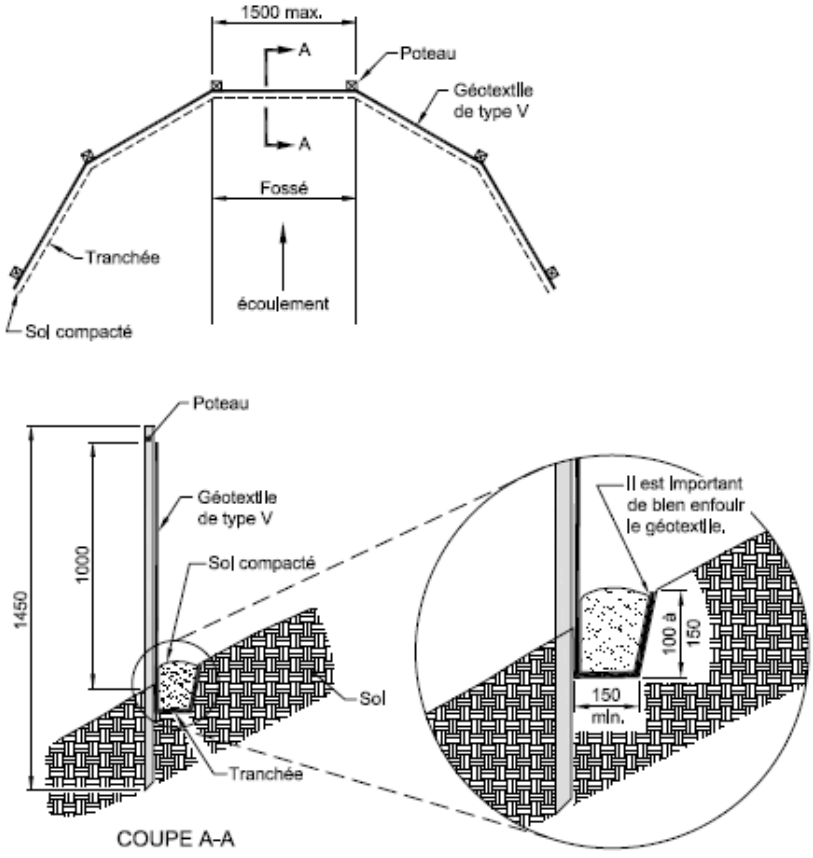


Figure 9.4–1
Exemple d'ancrage de ballots de paille pour disposition en série

Appendix 3

Barrier with geotextile



Note :

– les cotes sont en millimètres.

Figure 9.4–2
Installation d'une barrière munie d'un géotextile

Appendix 4

Sediments trap et filter berm

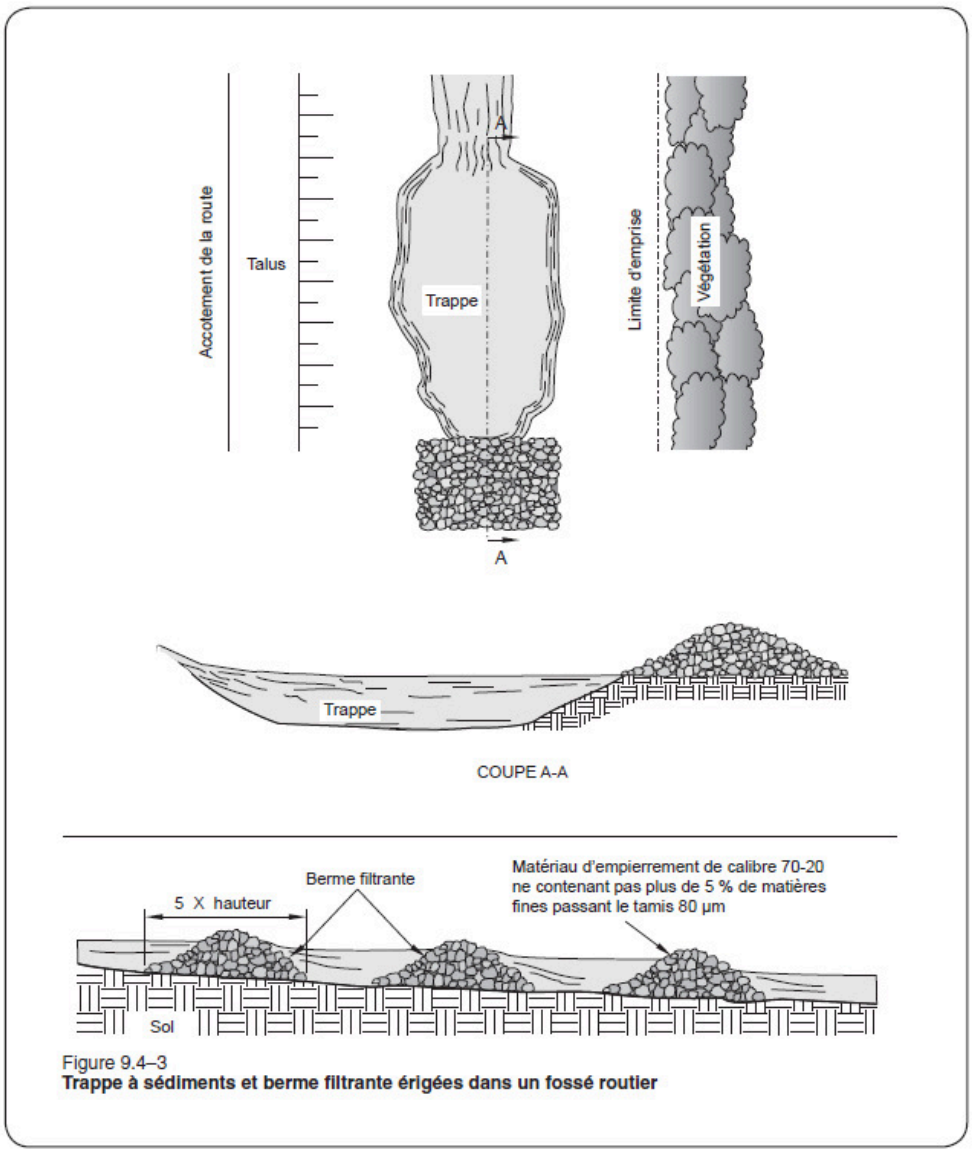


Figure 9.4–3
Trappe à sédiments et berme filtrante érigées dans un fossé routier

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 00 – Concrete forming and accessories

.2 Section 03 20 00 – Concrete reinforcing

.3 Section 03 30 00 – Cast-in-place concrete

.4 Section 03 30 03 – Concrete repair

.5 Section 31 23 11 – Excavation and backfilling

.6 Section 32 11 00 – Roadwork

.7 Section 33 31 00 – Culverts

1.2 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

1.3 INSPECTION

.1 Allow Work Supervisor accessing to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

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

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

.4 Work Supervisor will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Work Supervisor shall pay cost of examination and replacement.

1.4 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Parks Canada Agency (PCA) for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by PCA.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.

.4 If defects are identified during testing and/or inspections, the designated agency will require further inspection and/or additional testing to define the precise nature and extent

of these defects. The Contractor shall correct the defects as directed by the Work Supervisor, at no additional cost to the Work Supervisor, and pay the cost of retesting after the corrections are made.

1.5 ACCESS TO WORK

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

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

1.6 PROCEDURES

.1 Notify appropriate agency and Work Supervisor in advance of requirement for tests, in order that attendance arrangements can be made.

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

.3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.7 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Work Supervisor as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

.3 If in opinion of the Work Supervisor it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Owner will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by the Work Supervisor.

1.8 REPORTS

.1 Submit four (4) copies of inspection and test reports to the Work Supervisor.

.2 Provide copies to subcontractor of work being inspected or tested.

1.9 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

.2 Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Ministerial Representative and may be authorized as recoverable.

1.10 MILL TESTS

.1 Submit mill test certificates as required of specification sections.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Construction assistance.

.2 Trailer offices and locker.

1.2 INSTALLATION AND REMOVAL OF MATERIALS

.1 Provide, set up or arrange the building site installations necessary for completion of work as soon as possible.

.2 Dismount the material and dispose of it off site when no more needed.

1.3 ON SITE STORAGE/ELIGIBLE LOADS

.1 Make sure that work is carried out within the limits indicated in the contractual documents. Do not glut the site with materials in an unreasonable way.

.2 Do not to overload nor allow overloading any part of work in order to not compromise its integrity.

1.4 ON SITE PARKING

.1 It will be allowed to park on the building site in the condition not to block carrying out of the work.

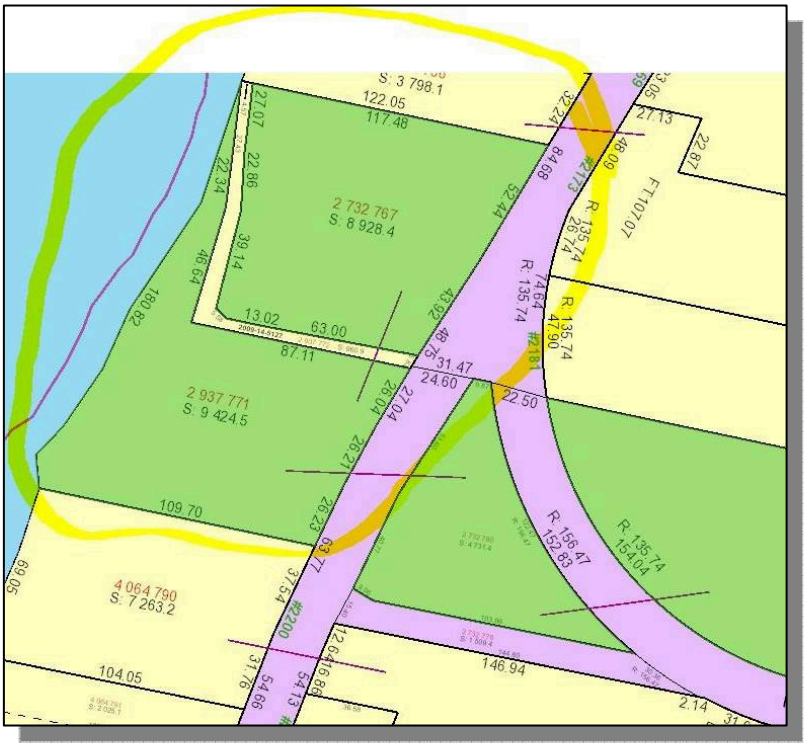
.2 Arrange suitable roads to access to the building site and ensure its maintenance.

.3 Arrange temporary access roads on places indicated or specified by the Ministerial Representative and ensure its maintenance.

.4 If it is allowed to use the existing roads to reach the building site, ensure their maintenance for all duration of the work and, if necessary, repair any damage.

1.5 TRAILER OFFICES

.1 The Contractor may use lot 2 937 771 for the installation of his trailer offices (see image below). This lot, located on Grande-Grave Boulevard, belongs to Parks Canada Agency (PCA). Since this lot is located at the entrance of the south area, no storage of equipment or materials will be allowed in this field.



.2 Prepare a ventilated office, heated at a temperature of 22 ºC, equipped with lighting ensuring a level of illumination of 750 lux and big enough to allow meetings, and prepare a table for the drawings. Also, the trailer must be supplied with electricity 115/230 volts.

.3 Provide clearly identify a complete first aid kit, and place it at an easy to reach place.

.4 If needed, the subcontractors must arrange their own office. Indicate them where they can install themselves.

.5 Trailer Office of the Ministerial Representative.

.1 Arrange a temporary office for the Ministerial Representative.

.2 The office must measure, interior wise, at least 5,0 m length X 3,0 m width X 2,4 m height with an adjacent office of at least 3,6 m length equally wide and the same height and with a floor located at 0,3 m above the ground, with also like 4 windows opening 50 % and a lockable door and provide electricity 115/230 volts.

.3 The office must be well insulated and be equipped with a heating system and air-conditioning ensuring a room temperature of 22 ºC when the outside temperature is -20 ºC.

.4 The walls and the ceiling must be covered with plywood panels, hard fiberboards or plasterboards, and then painted according to the selected colors. The floor must be covered with plywood panels of 19 mm thickness.

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.5 The office must be equipped with an electric lighting system ensuring a level of illumination of 750 lux; the apparatuses used must be of commercial type, with direct lighting with (10 % of the light upward directed), wall-mounted luminaries, provided with reflectors.

.6 Furnish the office with a table of 1 m X 2 m, a table of 1,2 m X 2,4 m, 12 chairs, an office chair with casters, of a dustbin, a cool water distributor, shelves of 300 mm width, adding up to 6 m length, a sorter with three drawers, a drawings support and a clothing support with shelf.

.7 Keep the places clean.

1.6 STORAGE OF THE MATRIEALS AND TOOLS

.1 Provide weatherproof lockers intended for materials and tools storage, and keep the lockers clean and in order.

.2 Leave on site materials which do not have to be kept with the shelter, but make sure they don't obstruct any work.

1.7 SANITARY FACILITIES

.1 Budget sanitary facilities for the workmen in accordance with the ordinances and relevant regulations.

.2 Post necessary advices and take all local health authorities required precautions. Keep the places and the sector clean.

1.8 TRAILER OFFICES ELECTRICITY

.1 The Contractor will be able to connect and disconnected, at his own expenses, the two trailer offices on the existing electricity network if applicable and will have to defray the costs of energy consumption.

.2 The Contractor must provide and install all required material for the connection.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 00 – Concrete forming and accessories

.2 Section 03 20 00 – Concrete reinforcing

.3 Section 03 30 00 – Cast-in-place concrete

.4 Section 03 30 03 – Concrete repair

1.2 REFERENCES

.1 If there is question as to whether products or systems are in conformance with applicable standards, the Work Supervisor reserves right to have such products or systems tested to prove or disprove conformance.

.2 Cost for such testing will be borne by the Work Supervisor in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.3 QUALITY

.1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise, utilizing recycled and recovered materials in execution of work.

.3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.

.4 Should disputes arise as to quality or fitness of products, decision rests strictly with the Work Supervisor based upon requirements of Contract Documents.

.5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.4 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify

the Work Supervisor of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.2 In event of failure to notify the Work Supervisor at commencement of Work and should it subsequently appear that Work may be delayed for such reason, the Work Supervisor reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.5 STORAGE, HANDLING AND PROTECTION

.1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.

.2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.

.3 Store products subject to damage from weather in weatherproof enclosures.

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

.5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.

.6 Store sheet materials, lumber on flat, solid supports and keep clear of ground. Slope to shed moisture.

.7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.

.8 Remove and replace damaged products at own expense and to satisfaction of the Work Representative.

.9 Touch-up damaged factory finished surfaces to Work Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates. It is prohibited to apply a finishing or a touch-up product on the nameplates.

1.6 TRANSPORTATION

.1 Pay costs of transportation of products required in performance of Work.

1.7 MANUFACTURER'S INSTRUCTIONS

.1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.

.2 Notify the Work Supervisor in writing, of conflicts between specifications and manufacturer's instructions, so that he will establish course of action.

.3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes the Work Supervisor to require removal and re-installation at no increase in Contract Price or Contract Time.

1.8 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify the Work Supervisor if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Work Supervisor reserves right to require dismissal from site, workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Work Supervisor, whose decision is final.

1.9 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.10 CONCEALMENT

.1 Before installation inform Work Supervisor if there is interference. Install as directed by the Work Supervisor.

1.11 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.12 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Bolts may not project more than one diameter beyond nuts.

.3 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of parts of building. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of the Work Supervisor.

1.15 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities of the respective companies, with minimum of disturbance to Work, and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority of the respective companies having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

.1 Submit to the Manager of Parks Canada Agency (PCA) copies of the following documents, including updates issued:

- .1 Health and Safety Program as indicated in paragraph 1.9, prior to commencement of work on the work site.
- .2 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
- .3 Accident or Incident Reports, within 24 hrs of occurrence.

.2 Submit other data, information and documentation upon request by the Manager of Parks Canada Agency (PCA) as stipulated elsewhere in this section.

1.2 COMPLIANCE REQUIREMENTS

.1 Comply with the latest edition of the Quebec Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

.2 Observe and enforce construction safety measures required by:

- .1 Ministère des Transports - Quebec Safety Code – Volume V – Traffic Control Devices
- .2 Highway Safety Code.
- .3 Provincial Worker's Compensation Board.
- .4 Municipal statutes and ordinances.

.3 In event of conflict between any provisions of above authorities the most stringent provision shall apply.

.4 Provide and maintain Worker's Compensation Board coverage for all employees for the duration of the contract. Prior to commencement of the work, at the time of Interim Completion and prior to final payment, provide to the Manager of Parks Canada Agency (PCA) a letter (certificate) of Clearance from the Workers' Compensation Board (or equivalent organism) indicating that the Contractor's account is in good standing.

- .1 Should the Contractor be a sole proprietor, provide documented proof in a form acceptable to the Manager of Parks Canada Agency (PCA), of an alternative means of personal coverage that meets or exceeds the requirements set out above for Worker's Compensation Board coverage.

1.3 RESPONSIBILITY

.1 The Contractor is responsible for safety of persons and property on the work site and for protection of federal employees and the general public circulating adjacent to work site operations to extent that they may be affected by conduct of work.

.2 The Contractor is to enforce compliance by workers and other persons granted access to work site with safety requirements of Contract Documents, applicable federal, provincial, and local statues, regulations, and ordinances, and with the Contractor's Health and Safety Program.

.3 Should an unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise the Manager of Parks Canada Agency (PCA) verbally and in writing of the hazard or condition.

1.4 SITE CONTROL AND ACCESS

.1 Control all work site access points and work site activities. Delineate and isolate the work site from adjacent and surrounding areas by use of appropriate means to maintain control of all work site access points.

.2 Make provisions for granting permission to access onto work site to all persons who require access. Procedures for granting permission to access are to be in accordance with the Quebec Occupational Health and Safety Act, and the Regulations made pursuant to the Act and the Contractor's Health and Safety Program.

.3 Ensure persons granted access to the work site are in possession of and wear the minimum personal protective equipment (PPE) designated by the Contractor's Health and Safety Program. Ensure persons granted access to the work site are provided with, trained in the use of, and wear, appropriate PPE that are required above and beyond the designated minimums previously noted and as specifically related to the work site activity that they are involved in. Be responsible for the efficacy of the PPE that is provided above and beyond the designated minimums.

.4 Erect signage at access points and at other strategic locations around the work site clearly identifying the work site area(s) as being "off-limits" to non-authorized persons. Signage must be professionally made with well understood graphic symbols and is not to be used as advertising but for the specific use as related to site safety and key contact information.

.1 Information to be provided on the signage is as follows:

.1 Project Name/Description:

.2 Contractor Company Name:

.3 Project Superintendent's Name/Phone No.:

.5 Secure the work site at all times to protect against un-authorized access.

1.5 FILING OF NOTICE

.1 File Notice of Project and any other required Notices with the Provincial Authorities prior to commencement of the work. Provide the Manager of Parks Canada Agency (PCA) with a copy of the filed Notice(s) prior to commencement of the work.

1.6 PERMITS

.1 Obtain permits, licenses and compliance certificates at appropriate times and frequencies as required by the authorities having jurisdiction.

.2 Post all permits, licenses and compliance certificates on work site and provide copies to the Manager of Parks Canada Agency (PCA).

1.7 PROJECT/SITE CONDITIONS

.1 The following are the known hazardous substances and/or hazardous conditions at the work site which shall be considered as health or environmental hazards and shall be properly managed should they be encountered as part of the work:

.1 Contractors are required to be aware of the known hazardous substances and/or hazardous conditions and are to include in their tender price all work associated in working with, in and around the hazards.

.2 The above lists shall not be construed as being complete and inclusive of all safety and health hazards encountered as a result of Contractor's operations during the course of work. Include above items into the hazard assessment program specified herein.

1.8 MEETINGS

.1 Prior to commencement of work attend a pre-commencement meeting conducted by the Manager of Parks Canada Agency (PCA). Ensure minimum attendance by contractor's site superintendent. The Manager of Parks Canada Agency (PCA) will advise of time, date and location of the meeting and will be responsible for recording and distributing the minutes.

.2 Conduct site specific occupational health and safety meetings as required by the Québec Occupational Health and Safety Act, and the Regulations made pursuant to the Act.

.3 Record and post minutes of all meetings in plain view on the work site. Make copies available to the Manager of Parks Canada Agency (PCA) upon request.

1.9 HEALTH AND SAFETY PROGRAM

.1 Contractors are required under Québec Occupational Health and Safety Act, and the Regulations made pursuant to the Act to have in place a Health and Safety Program. Compliance requirements for the content, detail and implementation of the program resides with the provincial/territorial authority. For the purpose of this contract the Health and Safety Program shall include a site-specific Health and Safety Plan that acknowledges, assesses and

addresses the hazardous substances and/or hazardous conditions known and identified in paragraph 1.7 above, and on-going hazard assessments performed during the progress of work identifying and documenting new or potential health risks and safety hazards not previously known and identified.

.2 Provide one copy of the Health and Safety Program to the Representative of Parks Canada Agency (PCA) prior to commencement of work on the work site. The copy provided to the Manager of Parks Canada Agency (PCA) is for the purpose of review against the contract requirements related to the known hazardous substances and/or hazardous conditions. The review is not to be construed to imply approval by the Manager of Parks Canada Agency (PCA) that the program is complete, accurate and legislatively compliant with the Québec Occupational Health and Safety Act, and the Regulations made pursuant to the Act, and shall not relieve the Contractor of their legal obligations under such legislation.

1.10 ACCIDENT REPORTING

.1 Investigate and report incidents and accidents as required by Quebec Occupational Safety and Health Act, and the Regulations made pursuant to the Act.

.2 For the purpose of this contract immediately investigate and provide a report to the Manager of Parks Canada Agency (PCA) on incidents and accidents that involve:

.1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s),

.2 Exposure to toxic chemicals or substances,

.3 Property damage,

.4 Interruption to adjacent and/or integral infrastructure operations with potential loss implications.

.3 In the investigation and reporting of incidents and accidents, the Contractor is required to respond in a timely fashion to correct the action that was deemed to have caused the incident and/or accident and to advise in writing on the action taken to prevent a re-occurrence of the incident and/or accident.

1.11 RECORDS ON SITE

.1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.

.2 Upon request, make copies available to the Manager of Parks Canada Agency (PCA).

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 23 11 – Excavation and backfilling

.2 Section 32 11 00 – Roadwork

1.2 QUALIFICATIONS OF SURVEYOR

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

1.3 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Work Supervisor.

.4 Report to Work Supervisor when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.4 SURVEY REQUIREMENTS

.1 Establish one (1) permanent bench mark on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for grading, fill and topsoil placement and landscaping features.

.4 Stake slopes.

1.5 EXISTING SERVICES

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

.2 Remove abandoned service lines within two (2) m of structures. Cap or otherwise seal lines at cut-off points as directed by the Work Supervisor.

1.6 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

.3 Record locations of maintained, re-routed and abandoned service lines.

1.7 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work.

1.8 SUBSURFACE CONDITIONS

.1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by the Ministerial Representative. Do not burn waste materials on site, unless approved by the Ministerial Representative.

.3 Contractor shall submit to the Departmental Representative proofs (bills, notes or any other evidence acceptable to the Departmental Representative) on the disposal of the different kinds of waste.

.4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

.5 Provide on-site containers for collection of waste materials and debris.

.6 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris off site.

.8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.

1.2 FINAL CLEANING

.1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.

.2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.

.3 Prior to final review remove surplus products, tools, construction machinery and equipment.

.4 Remove waste products and debris [other than] [including] that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by the Ministerial Representative. Do not burn waste materials on site, unless approved by the Ministerial Representative.

.6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.

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 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with the Ministerial Representative and Work Supervisor to review and discuss PCA's waste management goal.

.2 PCA's waste management goal is to divert 75 percent of total Project Waste from landfill sites.

.3 Provide Work Supervisor documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.4 Accomplish maximum control of solid construction waste.

.5 Preserve environment and prevent pollution and environment damage.

1.2 RELATED REQUIREMENTS

.1 Section 01 35 43 – Environmental procedures

.2 Section 01 74 11 – Cleaning

.3 Section 31 23 11 – Excavation and backfilling

.4 Section 32 11 00 – Roadwork

1.3 DEFINITIONS

.1 Class III: non-hazardous waste - construction renovation and demolition waste.

.2 Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices.

.3 Demolition Waste Audit (DWA): relates to actual waste generated from project.

.4 Inert Fill: inert waste - exclusively asphalt and concrete.

.5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.

.6 Recyclable: ability of product or material to be recovered at end of its life cycle and re manufactured into new product for reuse.

.7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

.8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

.9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:

.1 Salvaging reusable materials from re modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.

.2 Returning reusable items including pallets or unused products to vendors.

.10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.

.11 Separate condition: refers to waste sorted into individual types.

.12 Source separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

.13 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.

.14 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.

.15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.

1.4 DOCUMENTS

.1 Post and maintain in visible and accessible area at job site, one copy of following documents:

.1 Waste Audit,

.2 Waste Reduction Workplan,

.3 Waste Source Separation Program.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare and submit following prior to project start-up:

.1 Two (2) copies of completed Waste Audit (WA): Schedule A.

.2 Two (2) copies of completed Waste Reduction Workplan (WRW): Schedule B.

.3 Two (2) copies of Demolition Waste Audit (DWA): Schedule C.

.4 Two (2) copies of Cost/Revenue Analysis Workplan (CRAW): Schedule D.

.5 Two (2) copies of Waste Source Separation Program (WSSP).

.3 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.

.1 Failure to submit could result in hold back of final payment.

.2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off site or disposed of.

.3 For each material reused, sold or recycled from the project, include the quantity in kilograms identifying type and the destination.

.4 For each material landfilled from the project, include the quantity in kilograms and identify name and address of transfer station.

1.6 WASTE AUDIT (WA)

.1 Do the WA prior to project start-up.

.2 Prepare WA (see Schedule A).

.3 WA provides detailed inventory, estimated quantities and types of waste materials that will be generated as well as their potential to be reused and/or recycled.

1.7 WASTE REDUCTION WORKPLAN (WRW)

.1 Prepare WRW prior to project start-up.

.2 WRW should include but not limited to:

.1 Destination of materials listed.

.2 Deconstruction/disassembly techniques and sequencing.

.3 Schedule for deconstruction/disassembly.

.4 Location.

.5 Security.

.6 Protection.

.7 Clear labelling of storage areas.

.8 Details on materials handling and removal procedures.

.9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.

.3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.

.4 Describe management of waste.

.5 Starting from WA, identify opportunities to reduce, reuse/recycling of re-use of waste materials.

.6 Post WRW or summary where workers at site are able to review content.

.7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.

.8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.8 DEMOLITION WASTE AUDIT (DWA)

.1 Prepare DWA prior to project start-up.

.2 Fill out DWA (Schedule C).

.3 Provide an inventory of the quantities of waste materials to be recovered for re-use, recycling or disposal.

1.9 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Prepare CRAW (Schedule D).

1.10 MATERIAL SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP prior to project start up.

.2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Work Supervisor.

.3 Provide on site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide containers to deposit reusable and recyclable materials.

.5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.

.6 Locate separated materials in areas which minimize material damage.

.7 Collect, handle, store on site, and transport off site, salvaged materials in separate condition.

.1 Transport to approved and authorized recycling facility to users of material for recycling.

.8 Collect, handle, store on site, and transport off site, salvaged materials in combined condition.

.1 Ship materials to a site operating under Certificate of Approval.

.2 Materials must be immediately separated into required categories for reuse or recycling.

1.11 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by Work Supervisor.

.2 Unless specified otherwise, materials for removal become Contractor's property.

.3 Protect, stockpile, store and catalogue salvaged items.

.4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.

.5 Protect structural components not removed and salvaged materials from movement or damage.

.6 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.

.1 On-site source separation is recommended.

.2 Remove co-mingled materials to off site processing facility for separation.

.3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.

1.12 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste or volatile materials into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:

.1 Number and size of bins.

.2 Waste type of each bin.

.3 Total tonnage generated.

.4 Tonnage reused or recycled.

.5 Reused or recycled waste destination.

.4 Remove materials on-site as Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

1.13 SCHEDULING

.1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 APPLICATION

.1 Do Work in compliance with WRW.

.2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

.1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.

.2 Clean up work area as work progresses.

.3 Source separate materials to be reused/recycled into specified sort areas.

3.3 DIVERSION OF MATERIALS

.1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Work Supervisor, and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instruction on disposal practices.

.2 On-site sale of waste material is not permitted.

.3 Demolition waste:

Waste material	Recommended valorization (%)	Reel valorization (%)
Mecanical materials	100	
Metals	100	
Rubble	100	
Wood (uncontamined)	100	

.4 Construction waste:

Waste material	Recommended valorization (%)	Reel valorization (%)
Cardboard	100	
Plastic packaging	100	
Rubble	100	
Steel	100	
Wood (uncontamined)	100	
Others	100	

3.4 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA)

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Wood						
Metal						
Other						

3.5 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B

(1) Material Category	(2) Person(s) Respon-sible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	(5) Actual	(6) Recycled Amount (unit) Projected	(7) Actual	(8) Material(s) Destina-tion
Wood and Plastics Material Description							
Off-cuts							
Warped Pallet Forms							
Plastic Packaging							
Card- board Packaging							
Other							
Wood							
Metal							
Concrete							

3.6 DEMOLITION WASTE AUDIT (DWA)

.1 Schedule C – Demolition Waste Audit (DWA)

(1) Material Description	(2) Quantity	(3) Unit	(4) Total	(5) Volume (accum.)	(6) Observations and hypothesis
Wood					
Concrete					
Steel					
Other					

3.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Schedule D - Cost/Revenue Analysis Workplan (CRAW)

(1) Material Description	(2) Total Quantity (unit)	(3) Volume (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit (+/-) $	(6) Category Sub-Total (+/-) $	(7) Cost (-) Revenue (+) $
Wood						
Concrete						

3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

.1 Schedule E - Government Chief Responsibility for the Environment:

Province	Address	General Inquires	Fax
Canada (Quebec)	Ministère de l'Environnement et de la Faune, Siège social 150, boul. René-Lévesque Est, Québec QC G1R 4Y1	418 643-3127 1 800 561-1616	418 646-5974
	Conseil de la conservation et de l'environnement 800, place d'Youville, 19e étage Québec QC G1R 3P4	418 643-3818	
Montreal	Division du contrôle des rejets industriels, Direction de l'Environnement Service des infrastructures, transport et environnement 827, boul. Crémazie Est, bureau 202 Montréal (Québec) H2M 2T8		
Quebec (Montreal)	5199, rue Sherbrooke Est Bureau 3860 Montréal(Québec) H1T 3X9 Courriel : montreal@mddefp.gouv.qc.ca	514 873-3636	514 873-5662

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal procedures

1.2 SECTION CONTENTS

.1 Project file, samples and specifications;

.2 Shop drawings;

.3 Annotated plans, consistent with execution;

.4 Technical sheets, materials, equipment and finishing products, and related information;

.5 Materials/equipment replacement, special tools and spare parts;

.6 Guarantees and suretyships of site Parks Canada Agency (PCA).

1.3 SUBMITTALS

.1 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.2 Copy will be returned after final inspection, with Ministerial Representative comments.

.3 Revise content of documents as required prior to final submittal.

.4 Two weeks prior to Substantial Performance of the Work, submit to Manager of Parks Canada two final copies of requested documents in French.

.5 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.

.6 Furnish evidence, if requested, for type, source and quality of products provided.

.7 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.8 Pay costs of transportation.

.9 The Contractor supplies all documents to be submitted at the end of works in PDF file format.

1.4 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by systems, under Section numbers and sequence of Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

.9 Provide CAD files on scale 1:1 on dwg format on CD.

1.5 CONTENTS – EACH VOLUME

.1 Table of Contents: provide title of project;

.1 Date of submission; names. addresses, and telephone numbers of the Ministerial Representative and Contractor with name of responsible parties.

.2 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.5 Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.

1.6 AS -BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for the Ministerial Representative one record copy of:

.1 Contract Drawings,

.2 Specifications,

.3 Addenda,

.4 Change Orders and other modifications to Contract

.5 Reviewed shop drawings, product data, and samples,

.6 Field test records,

.7 Inspection certificates and Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes. Keep record documents and samples available for inspection by the Ministerial Representative.

1.7 RECORDING SITE CONDITIONS

.1 Record information on two (2) sets of black line opaque drawings, and one (1) in copy of Project Manual.

.2 Provide felt tip marking pens, maintaining separate colors for each major system, for recording information. Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.3 Contract Drawings and shop drawings: mark each item to record actual construction, including:

.1 Field changes of dimension and detail,

.2 Changes made by change orders,

.3 Details not on original Contract Drawings,

.4 References to related shop drawings and modifications.

1.8 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Remove damaged or destroyed products and replace them at no additional cost to the satisfaction of the Ministerial Representative.

1.9 WARRANTIES

.1 The warranty shall be worded as follows: Parks Canada Agency.

.2 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing. All warranties should be found in the operation and maintenance manual. List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.3 Except for items put into use with the Ministerial Representative permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.4 Make sure that the documents are in good and due form, they contain all the necessary information.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 35 29 – Health and Safety Requirements

.2 Section 01 35 43 – Environmental Procedures

.3 Section 01 74 11 – Cleaning

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

.5 Section 31 23 11 – Excavation and backfilling

.6 Section 32 11 00 – Roadworks

.7 Section 33 31 00 – Culverts

.8 Section 32 91 21 – Topsoil and finish earthwork

1.2 REFERENCES

.1 CSA International

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

.2 U.S. Environmental Protection Agency (EPA)/Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

.3 Canadian Environmental Council of Ministers.

.1 PN1327, Code of Practice for the protection of the environment on systems aboveground and underground storage of petroleum products and related product.

.4 Canadian Justice Ministry.

.1 Canadian Environmental Assessment Act (LCEE), 1997, ch. 37.

.2 Canadian Environmental Protection Act (LCPE), 1999, ch. 33.

.5 Canada Health – Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheet (MSDS).

.6 Canada Transportation(CT).

.1 Act 1992 on transport of dangerous goods (LTMD), ch. 34.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Technical notes: Submit MSDS required to the Workplace Hazardous Materials Information System (WHMIS), which must conform to this system.

.3 Shop Drawings

.1 The drawings must have the seal and signature of a recognized or authorized engineer who can legally work in the province of Quebec.

.4 Submit demolition drawings:

.1 Submit for review and approval by the Ministerial Representative shoring and underpinning drawings stamped and signed by professional engineer registered or licensed in the Province Territory of Québec, Canada, showing proposed method.

.5 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan Waste Reduction Workplan highlighting recycling and salvage requirements.

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50 % of construction wastes were recycled or salvaged.

.6 Provide weekly weighing slips issued by certified landfills and recycling centers for all materials removed from the site.

.1 Obtain written permission from the Ministerial Representative before transporting materials elsewhere to waste management centers that are not listed on the waste reduction plan.

1.4 QUALITY ASSURANCE

.1 Requirements of regulatory agencies: make sure that all works are performed in accordance with CEPA, CEAA, the TDG Act and any provincial / territorial regulations.

1.5 SITE CONDITIONS

.1 Protection de l'environnement

.1 Perform works in accordance with section 01 35 43 – Environmental Procedures.

Part 2 Products

2.1 MATERIALS

.1 Leave machinery and equipment on only when those are in use, except in extreme temperatures, where it is not recommended to stop the engines.

Part 3 Execution

3.1 EXAMINATION

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

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

.3 Disconnect, cap, plug or divert, as required, existing public utilities within the property where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore up and maintain pipes and conduits encountered.

.1 Immediately notify Ministerial Representative and utility company concerned in case of damage to any utility or service, designated to remain in place.

.2 Immediately notify Ministerial Representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

3.2 HAZARDOUS WASTE REMOVAL

.1 Remove all hazardous or contaminated materials by the appropriate authorities. Take all necessary measures to minimize dangers during their removal and disposal out of the site work.

3.3 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to: requirements of authorities having jurisdiction, sediment and erosion control drawings, sediment and erosion control plan specific to site, requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during demolition.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal after completion of demolition work.

.2 Protection of In-Place Conditions:

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features and parts of building to remain in place. Provide bracing and shoring required.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Provide temporary dust screens, covers, railings, supports and other protection as required.

.4 Do Work in accordance with Section 01 35 29 - Health and Safety Requirements.

.3 Demolition/Removal:

.1 Remove items as indicated.

.2 Removal of Pavements, Curbs and Gutters:

.1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by the Ministerial Representative.

.2 Protect adjacent joints and load transfer devices.

.3 Protect underlying and adjacent granular materials.

.3 Paving removal

.1 Cutting at right angle all paving surfaces which must remain in place; use a saw or other means approved by the Ministerial Representative.

.2 Making a second cut at right angle to surfaces that stay in place to ensure the quality of the joint.

.4 Foundation and Sub foundation removal

.1 Excavation materials from existing foundation may be recovered as fill material for the reconstruction of embankments (if necessary) if they meet the requirements of the drawings and specifications. The method recommended by the contractor shall be submitted to the Ministerial Representative for approval.

.2 Surplus materials meeting the requirements of backfill and approved by the Ministerial Representative, which will not be used in the project will be set aside for their reuse later. This surplus must be the first materials to be disposed in the National Forillon Park Section 2 project, as shown in the sketch annexed to the specifications. The Contractor shall carry and lay these materials at its own expense in accordance with the location and the levels provided by the Ministerial Representative.

.3 Blocks of rock found in excavated areas must be removed and disposed in authorized areas upon the Ministerial Representative instructions. Excavations shall be backfilled with granular materials, MG-20 type, to the satisfaction of the Ministerial Representative.

.4 During the excavation works, the Contractor shall protect at all-time public utilities which are under the shoulders as shown on the drawings and Section 31 23 11 - Civil / excavation and backfilling.

.5 When removing existing pavement for which it will be incorporated at a later stage in the proposed pavement materials, prevent mixing with granular materials from the base layer.

.6 Fence removal

.1 Remove and dispose all fences in a site approved by the Ministerial Representative.

.7 Concrete wall removal

.1 Break down concrete wall, steel and existing foundation

.2 Dispose all materials in a site approved by the Ministerial Representative

.3 Backfill excavations

.8 Dig at least 300mm below the invert of a pipe when pipes, located under existing or proposed paving surfaces, must be removed.

.9 Remove designated trees during construction

.1 A written confirmation from the Ministerial Representative is necessary before removing an undesignated tree.

.10 Remove designated trees upon ecological method

.1 Grind, chip or shred other vegetation to make mulch, compost or fuel.

.11 Depose topsoil for final grading and landscaping

.1 If this topsoil is not used immediately, provide anti erosion measures and seeding work.

.12 Recuperation

.1 Set aside, if necessary, the recovered materials.

.13 Elimination

.1 Clear out not designated materials to be recovered, recycled or reused on approved sites.

.14 Backfilling

.1 Realize backfilling works upon section 31 23 11 – Excavation and Backfilling.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Make sure surfaces and structures located outside the demolition zones are deliver as they were before works.

.3 Use solutions and cleaning methods that are not harmful to health or vegetation, and do not endanger wildlife, watercourses and groundwater.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Refer to demolition drawings and specifications for items to be salvaged for reuse.

.4 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 PROTECTION

.1 Repair all damages done to materials, equipment or adjacent property by selective works.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 70 12 – Safety Requirements

.2 Section 01 33 00 – Submittal Procedures

1.2 REFERENCES

.1 Canadian Environmental Protection Act, 1999 (CEPA 1999)

.1 Export and Import of Hazardous Waste Regulations (SOR/2002-300)

.2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS)

.3 National Fire Code of Canada 2005

.4 Transportation of Dangerous Goods Act (TDG Act) 1999, (c. 34)

.5 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2003-400)

1.3 DEFINITIONS

.1 Dangerous Goods: product, substance, or organism that is specifically listed or meets hazard criteria established in Transportation of Dangerous Goods Regulations.

.2 Hazardous Material: product, substance, or organism that is used for its original purpose; and that is either dangerous goods or a material that may cause adverse impact to environment or adversely affect health of persons, animals, or plant life when released into the environment.

.3 Hazardous Waste: any hazardous material that is no longer used for its original purpose and that is intended for recycling, treatment or disposal.

.4 Workplace Hazardous Materials Information System (WHMIS): Canada-wide system designed to give employers and workers information about hazardous materials used in workplace. Under WHMIS, information on hazardous materials is provided on container labels, material safety data sheets (MSDS), and worker education programs. WHMIS is put into effect by combination of federal and provincial laws.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.1 Submit to Ministerial Representative current Material Safety Data Sheet (MSDS) for each hazardous material required prior to bringing hazardous material on site.

.2 Submit hazardous materials management plan to Ministerial Representative that identifies hazardous materials, their use, their location, personal protective equipment requirements, and disposal arrangements.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Co-ordinate storage of hazardous materials with Ministerial Representative and comply with internal requirements for labelling and storage of materials and wastes.

.2 Store and handle hazardous materials and wastes in accordance with applicable federal and provincial laws, regulations, codes, and guidelines.

.3 Store and handle flammable and combustible materials in accordance with current National Fire Code of Canada requirements.

.4 Keep no more than 45 L of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

.1 Store flammable and combustible liquids in approved safety cans bearing the Underwriters' Laboratory of Canada or Factory Mutual seal of approval.

.2 Storage of quantities of flammable and combustible liquids exceeding 45 L for work purposes requires the approval of the Ministerial Representative.

.5 It is forbidden to transfer of flammable and combustible liquids in vicinity of open flames or heat-producing devices.

.6 Do not use flammable liquids having flash point below 38 ºC, such as naphtha or gasoline as solvents or cleaning agents.

.7 Store flammable and combustible waste liquids for disposal in approved containers located in safe, ventilated area. Keep quantities to minimum.

.8 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

.9 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for solids, and 5 L for liquids:

.1 Store hazardous materials and wastes in closed and sealed containers,

.2 Label containers of hazardous materials and wastes in accordance with WHMIS,

.3 Store hazardous materials and wastes in containers compatible with that material or waste,

.4 Segregate incompatible materials and wastes,

.5 Ensure that different hazardous materials or hazardous wastes are not mixed,

.6 Store hazardous materials and wastes in secure storage area with controlled access,

.7 Maintain clear egress from storage area,

.8 Store hazardous materials and wastes in location that will prevent them from spilling into environment,

.9 Have appropriate emergency spill response equipment available near storage area, including personal protective equipment.

.10 Maintain inventory of hazardous materials and wastes, including product name, quantity, and date when storage began.

.10 Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.11 Report spills or accidents immediately to Ministerial Representative. Submit a written spill report to Ministerial Representative within 24 hours of incident.

1.6 TRANSPORTATION

.1 Transport hazardous materials and wastes in accordance with federal Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.2 If exporting hazardous waste to another country, ensure compliance with federal Export and Import of Hazardous Waste Regulations.

.3 If hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Ministerial Representative.

.2 Ensure compliance with applicable federal, provincial and municipal laws and regulations for generators of hazardous waste.

.3 Use licensed carrier authorized by provincial authorities to accept subject material.

.4 Prior to shipping material obtain written notice from intended hazardous waste treatment or disposal facility that it will accept material and that it is licensed to accept this material.

.5 Label containers with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Ensure that trained personnel handle, offer for transport, or transport dangerous goods.

.7 Provide photocopy of shipping documents and waste manifests to Ministerial Representative.

.8 Track receipt of completed manifest from consignee after shipping dangerous goods. Provide a photocopy of completed manifest to Ministerial Representative.

.9 Report discharge, emission, or escape of hazardous materials immediately to Ministerial Representative and appropriate provincial authority. Take reasonable measures to control release.

Part 2 Products

2.1 MATERIALS

.1 Only bring on site quantity of hazardous materials required to perform work.

.2 Maintain MSDS in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

Part 3 Execution

3.1 DISPOSAL

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 20 00 – Concrete reinforcing

.2 Section 03 30 00 – Cast-in-place concrete

.3 Section 03 30 03 – Concrete rehabilitation

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA-O86S1-05, Supplement No. 1 to CAN/CSA-O86-01, Engineering Design in Wood.

.3 CSA O121-M1978(R2003), Douglas Fir Plywood.

.4 CSA O151-04, Canadian Softwood Plywood.

.5 CSA O153-M1980(R2003), Poplar Plywood.

.6 CAN/CSA-O325.0-92(R2003), Construction Sheathing.

.7 CSA O437 Series-93(R2006), Standards for OSB and Waferboard.

.8 CSA S269.1-1975(R2003), Falsework for Construction Purposes.

.9 CAN/CSA-S269.3-M92(R2003), Concrete Formwork, National Standard of Canada

.2 Underwriters' Laboratories of Canada (ULC)

.1 CAN/ULC-S701-05, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.3 Ministère des Transports du Québec (MTQ)

.1 *Cahier des charges et devis généraux – Infrastructures routières – Construction et réparation* (CCDG)

.2 Ouvrages routiers, Normes, Tome VII – Matériaux, norme 3101, *Béton de masses volumiques normales*.

.3 Ouvrages routiers, Normes, Tome VII – Matériaux, norme 3501, *Matériaux de cure*.

.4 Ouvrages routiers, Normes, Tome VII – Matériaux, norme 3801, *Mortiers cimentaires en sac*.

.5 Ouvrages routiers, Normes, Tome VII – Matériaux, norme 3901, *Coulis cimentaires*.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit shop drawings for formwork and falsework.

.1 Submit drawings stamped and signed by professional engineer member of the *Ordre des ingénieurs du Québec*.

.3 Submit required Material Safety Data Sheets (MSDS), in accordance with the Workplace Hazardous Materials Information System (WHMIS) and according to Section 01 35 29 – Health and Safety Requirements and Section 01 35 43 – Environmental Procedures.

.4 Shop drawings must indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CSA S269.1, for falsework drawings Comply with CAN/CSA-S269.3 for formwork drawings.

.5 Provide shop drawings including formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.6 Provide sequence of erection and removal of formwork/falsework as directed by the Ministerial Representative.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

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

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Divert wood materials from landfill to a recycling reuse composting facility as approved by the Ministerial Representative.

.4 Divert plastic materials from landfill to a recycling reuse composting facility as approved by the Ministerial Representative.

.5 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Ministerial Representative.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121.

.2 For concrete with special architectural features, use formwork materials to CSA-A23.1/A23.2.

.2 Form ties:

.1 For concrete not designated 'Architectural', use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.

.2 For Architectural concrete, use snap ties complete with plastic cones and light grey concrete plugs.

.3 Form release agent: non-toxic, biodegradable, low VOC.

.4 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm^2/s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.

.5 Falsework materials: to CSA-S269.1.

Part 3 Execution

3.1 FABRICATION AND ERECTION

.1 Verify lines, levels and centres before proceeding with formwork/falsework and ensure dimensions agree with drawings.

.2 Obtain Ministerial Representative's approval for use of earth forms framing openings not indicated on drawings.

.3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.

.4 Fabricate and erect falsework in accordance with CSA S269.1.

.5 Do not place shores and mud sills on frozen ground.

.6 Provide site drainage to prevent washout of soil supporting mud sills and shores.

.7 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.

.8 Align form joints and make watertight.

.1 Keep form joints to minimum.

.9 Unless otherwise specified, use 15 mm chamfer strips for sharp edges and/or rods of 15 mm for the re-entrant corners of formwork joints.

.10 Grooves, slots, openings, drip edges, re-entrants, and expansion and contraction joints must comply with specifications.

.11 Embed anchors, sleeves, and other embedded items required for the works specified in other sections.

.1 Ensure that anchors and embeds do not protrude from surfaces to be coated with a finishing product, a coat of paint for example.

.12 Coat the inside of the formwork with a commercially available form removal agent designed to prevent the adhesion of concrete.

.13 Brush forms before their installation according to the application rate specified in the data sheet of the product to be used. The form removal agent should not come in contact with the reinforcement.

.14 Determine the elevation of the concrete pour by the top of formwork or by molding.

.15 Before pouring the concrete, clean formwork in accordance with CSA standard A23.1/A23.2, latest edition.

.1 For cleaning formwork, use a compressed air jet, a jet of pressurized water, or a vacuum to remove any ice, snow, debris, or other foreign matter.

.2 The air jet must be equipped with a filter that removes oil. Demonstrate the effectiveness of the filter before use.

.3 Use mixing water for concrete in accordance with CSA standard A23.1/A23.2, latest edition, for cleaning formwork.

3.2 REMOVAL AND RESHORING

.1 After pouring the concrete, leave the formwork in place for at least the minimum period as indicated by the CCDG, article15.4.3.1.6.

.2 Remove formwork when concrete has reached 70 % of its design strength or minimum period noted above, whichever comes later, and replace immediately with adequate reshoring.

.3 The formwork shall be considered removed once it has been loosened and a part of it is no longer in contact with the concrete.

.4 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 00 – Concrete forming and accessories

.2 Section 03 30 00 – Cast-in-place concrete

.3 Section 03 30 03 – Concrete Rehabilitation

1.2 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Measure reinforcing steel in kilograms of steel incorporated into Work, computed from theoretical unit mass specified in CSA-G30.18 for lengths and sizes of bars as indicated or authorized in writing by the Ministerial Representative.

1.3 REFERENCES

.1 American Concrete Institute (ACI)

.1 SP-66, ACI Detailing Manual 2004.

.2 ASTM International

.1 ASTM A82/A82M, last edition, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A143/A143M, last edition, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.3 ASTM A185/A185M, last, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.

.4 ASTM A775/A775M, last edition, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.3 CSA International

.1 CSA-A23.1-04/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-A23.3, Design of Concrete Structures, latest edition.

.3 CSA-G30.18, Carbon Steel Bars for Concrete Reinforcement, latest edition.

.4 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel, latest edition.

.5 CAN/CSA-G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles Metals and Metal Products, latest edition.

.6 CSA W186-M1990, Welding of Reinforcing Bars in Reinforced Concrete Construction, latest edition.

.4 Reinforcing Steel Institute of Canada (RSIC)

.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

.5 Ministère des Transports du Québec (MTQ)

.1 *Cahier des charges et devis généraux – Infrastructures routières – Construction et réparation* (CCDG), latest edition.

.2 Ouvrages routiers, Normes, Tome VII – Matériaux, norme 5101, *Armatures pour les ouvrages de béton*, latest edition.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Prepare reinforcement drawings in accordance with RSIC Manual of Standard Practice SP-66.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer, member in good standing with the *Ordre des ingénieurs du Québec* (OIQ).

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by the Ministerial Representative, with identifying code marks to permit correct placement without reference to structural drawings.

.5 Indicate sizes, spacings and locations of chairs, spacers and hangers.

.2 Detail lap lengths and bar development lengths to CAN/CSA-A23.3, unless otherwise indicated.

.4 When Chromate solution is used as replacement for galvanizing non-prestressed reinforcement, provide product description for review by the Work Supervisor prior to its use.

1.5 QUALITY ASSURANCE

.1 Quality assurance:

.1 Mill Test Report: upon request, provide Ministerial Representative with certified copy of mill test report of reinforcing steel, a minimum of four (4) weeks prior to beginning reinforcing work.

.2 Upon request submit in writing to Ministerial Representative proposed source of reinforcement material to be supplied.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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, indoors, in a dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

.4 Develop Construction Waste Management Plan Waste Reduction Work Plan related to Work of this Section.

Part 2 Products

2.1 MATERIALS

.1 Ensure the reinforcing steel is free of dirt, earth, rust, oil, and hardened concrete spatter from a previous concrete pour.

.2 Ensure that the reinforcing steel bars to be used are not bent or twisted.

.3 Any replacement of reinforcing steel by different sized bars must be authorized in writing by the Ministerial Representative.

.4 Reinforcing steel: billet steel, grade 400W, deformed bars to CSA-G30.18, unless otherwise indicated.

.5 Reinforcing steel: weldable low alloy steel deformed bars to CSA-G30.18.

.6 Cold-drawn annealed steel wire ties: to ASTM standard A82/A82M.

.7 Deformed steel wire for concrete reinforcement: to ASTM A82/A82M.

.8 Welded steel wire fabric: to ASTM A185/A185M.

.1 Provide in flat sheets only.

.9 Welded deformed steel wire fabric: to ASTM A82/A82M.

.1 Provide in flat sheets only.

.10 Galvanizing of non-prestressed reinforcement: minimum galvanization of 87 µm according to CAN/CSA-G164, latest edition, *Hot Dip Galvanizing of Irregularly Shaped Articles*.

.11 Mechanical splices: subject to approval of the Ministerial Representative.

.12 Plain round bars: to CSA-G40.20/G40.21.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and with the *Reinforcing Steel Manual of Standard Practice* by the Reinforcing Steel Institute of Canada (RSIC).

.2 Obtain Ministerial Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of Ministerial Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

.5 Apply tolerances for length and bending of reinforcing steel as specified in Figure 6.1 of the RSIC *Reinforcing Steel Manual of Standard Practice*.

.6 Unless otherwise indicated on the drawings and specifications, apply a minimum length of 600 mm overlap between interconnecting bars following work carried out in several distinct phases.

2.3 SOURCE QUALITY CONTROL

.1 Upon request, provide Ministerial Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, minimum two (2) weeks prior to beginning reinforcing work.

.2 Upon request, inform Ministerial Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 PREPARATION

.1 Galvanizing to include chromate treatment.

.1 Duration of treatment to be 1 hour per 25 mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by the Ministerial Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.1 Bending: cold bending by machine.

.3 Replace bars, which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Ministerial Representative's approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

.4 Secure reinforcing steel using steel wire ties to prevent movement during the pouring of concrete:

- .1 Attach firmly the reinforcing steel at intersections if these intersections are 300 mm or more away or at every two (2) intersections if distance is lesser.
- .2 In the case of repair works, the reinforcing steel bars are fixed to the formwork ties.
- .3 To link the reinforcing steel, use annealed steel wire with a diameter of at least 1.6 mm (16 gauge).
- .4 For galvanized steel reinforcement, use galvanized steel wire.
- .5 Fold wires to obtain the same cover as required for reinforcement.

.5 Replace existing reinforcing steel whose ties have been altered during the demolition works in their original position.

- .1 Attach the reinforcement to each formwork tie in order to meet the required concrete cover and a minimum distance of 25 mm between the reinforcing steel and the concrete to be conserved.

.6 Use plastic spacers spaced at a maximum distance of 1,200 mm from center to center, to maintain the reinforcing steel at the required distance from the forms, the ground, or the existing concrete:

- .1 Use circular plastic spacers whose center is fixed to the reinforcing steel for holding in position the reinforcing steel grids comprising 15 M and 20 M bars.
- .2 Use plastic spacers to maintain upright the reinforcing steel grids comprising bars sized 25 M or larger.
- .3 Use continuous wedges with plastic coated wire and coated plastic tabs to keep horizontal the reinforcing steel grid which is closest to the formwork, the ground, or the existing concrete.
- .4 Unless otherwise indicated in the drawings and specifications, use individual plastic spacers for the horizontal reinforcing steel.

.7 During repair works, at the request of the Ministerial Representative, add reinforcement if the existing reinforcing steel bars have been thinned by corrosion enough to reduce the structural capacity of the structure.

- .1 Install this additional reinforcement to obtain a minimum overlap of 600 mm.
- .2 If required, demolish concrete to respect this requirement.
- .3 Prior to placing concrete, obtain Ministerial Representative's approval of reinforcing material and placement.

.4 Ensure that the integrity of the reinforcement coating is preserved during concrete pouring.

.5 During transport and handling, cover the galvanized bars to protect them adequately.

3.4 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of epoxy coated or galvanized reinforcing steel with compatible finish to provide continuous coating.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section01 74 11 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 00 – Concrete forming and accessories

.2 Section 03 20 00 – Concrete reinforcing

.3 Section 03 30 03 – Concrete rehabilitation

1.2 REFERENCES

.1 Abbreviations and Acronyms:

.1 Portland Cement: hydraulic cement, blended hydraulic cement (b suffix - b denotes blended) and Portland-limestone cement.

.1 Type GU, GUb and GUL - General use cement.

.2 Type MS and MSb - Moderate sulphate-resistant cement.

.3 Type MH, MHb and MHL - Moderate heat of hydration cement.

.4 Type HE, HEb and HEL - High early-strength cement.

.5 Type LH, LHb and LHL - Low heat of hydration cement.

.6 Type HS and HSb - High sulphate-resistant cement.

.2 Fly ash:

.1 Type F - with CaO content less than 15 %.

.2 Type CI - with CaO content ranging from 15 to 20 %.

.3 Type CH - with CaO greater than 20 %.

.3 GGBFS - Ground, granulated blast-furnace slag.

.2 Reference Standards:

.1 ASTM International

.1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-11, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-13, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.5 ASTM D412-06a (2013), Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

.6 ASTM D624-00 (2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.

.7 ASTM D1751-04 (2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.8 ASTM D1752-04a (2008), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 CSA International

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06 (R2011), Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation Meetings: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart, convene pre-installation meeting one week prior to beginning concrete works.

.1 The Ministerial Representative and a representative of the testing laboratory must be present.

.2 Verify project requirements.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide testing inspection results reports for review by the Ministerial Representative and do not proceed without written approval when deviations from mix design or parameters are found.

.3 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.

.4 Concrete hauling time: provide for review by Departmental Representative DCC Representative Ministerial Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.5 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Provide the Ministerial Representative, minimum 2 weeks prior to starting concrete work, with valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Minimum 2 weeks prior to starting concrete work, provide proposed quality control procedures for review by Ministerial Representative on following items:

.1 Falsework erection.

.2 Hot weather concrete.

.3 Cold weather concrete.

.4 Curing.

.5 Finishes.

.6 Formwork removal.

.7 Joints.

.4 Quality Control Plan: provide written report to the Ministerial Representative verifying compliance that concrete in place meets performance requirements of concrete as established in PART 2 - PRODUCTS.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.1 Do not modify maximum time limit without receipt of prior written agreement from the Ministerial Representative and concrete producer as described in CSA A23.1/A23.2.

.2 Deviations to be submitted for review by the Ministerial Representative.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

.2 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.7 SITE CONDITIONS

.1 Place concrete while complying with the temperature limits in CAN/CSA-A23.l/A23.2.

.2 Do not place concrete:

.1 When the air temperature is above 22 °C.

.2 In the presence of rain or excessive wind or dust.

.3 If the conditions, in the opinion of the Ministerial Representative, seem harmful to concrete.

.3 Comply with cold weather requirements when the air temperature drops below 5 °C.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Alternative 1 - Performance : to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 PERFORMANCE CRITERIA

.1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by the Ministerial Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

2.3 MATERIALS

.1 Portland Cement: to CSA A3001, Type GU.

.2 Blended hydraulic cement: Type GUb to CSA A3001.

.3 Portland-limestone cement: Type GUL to CSA A23.1.

.4 Supplementary cementing materials: selon la norme CAN/CSA A3001 et selon les exigences suivantes :

- .1 Remplacement minimal de 15 % de cendres volantes selon la masse des matériaux cimentaires au total.
- .2 Minimum de 5 % de fumées de silice.
- .3 Remplacement maximal de 30 % selon la masse des matériaux cimentaires au total.

.5 Water: to CSA A23.1.

.6 Aggregates: to CSA A23.1/A23.2.

.7 Admixtures:

- .1 Air entraining admixture: to ASTM C260.
- .2 Chemical admixture: to ASTM C494. Ministerial Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.8 Shrinkage compensating grout: premixed compound consisting of metallic non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.

- .1 Compressive strength: 35 MPa at 28 days.
- .2 Net shrinkage at 28 days: maximum 0.08 %.

.9 Non premixed dry pack grout: composition of non metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 35 MPa at 28 days.

.10 Post-Tensioning Ducts: to CSA A23.1/A23.2.

.11 Premoulded joint fillers:

- .1 Bituminous impregnated fiber board: to ASTM D1751.

.12 Weep hole tubes: galvanized steel plastic.

.13 Polyethylene film: 0.15 mm thickness to CAN/CGSB-51.34.

2.4 MIXES

.1 Alternative 1 - Performance Method for specifying concrete performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

.2 Provide concrete mix to meet following plastic state requirements:

.1 Workability: free of surface blemishes loss of mortar colour variations segregation.

.3 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Compressive strength at 28 age: 35 MPa minimum.

.3 Intended application: repair work and barriers.

.4 Aggregate size: 22 mm maximum.

.5 Pre-Qualification: air-entraining agent, slump, and temperature results based on the previous use of the proposed mixture.

.4 Provide quality management plan to ensure verification of concrete quality to specified performance.

.5 Certification du fournisseur de béton : la centrale de malaxage et les matériaux doivent satisfaire aux exigences de la norme CAN/CSA A23.1.

Part 3 Execution

3.1 PREPARATION

.1 Obtain Ministerial Representative's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete will not be permitted is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain Ministerial Representative approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.10 In locations where new concrete is dowelled to existing work, drill holes in existing concrete.

.1 Place steel dowels of deformed steel reinforcing bars and pack solidly with shrinkage compensating grout epoxy grout to anchor and hold dowels in positions as indicated.

.11 Do not place load upon new concrete until authorized by Ministerial Representative.

.12 Immediately before placing concrete, properly water the substrate with clean water.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through joists, beams, column capitals or columns, except where indicated or approved by the Ministerial Representative.

.2 Where approved by the Ministerial Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Sleeves and openings greater than 100 x 100 mm not indicated must be reviewed by the Ministerial Representative.

.4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from the Ministerial Representative before placing of concrete.

.5 Confirm locations and sizes of sleeves and openings shown on drawings.

.6 Set special inserts for strength testing as indicated and as required by non-destructive method of testing concrete.

.3 Anchor bolts:

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from the Ministerial Representative.

.1 Formed holes: 100 mm minimum diameter.

.2 The diameter of the drilled holes after the concrete has set must comply with the manufacturer's recommendations.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with shrinkage compensating grout epoxy grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.4 Drainage holes and weep holes:

.1 Form weep holes and drainage holes in accordance with Section 03 10 00 - Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.5 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.2 Use procedures as reviewed by the Ministerial Representative to remove excess bleed water. Ensure surface is not damaged.

.3 Finishing:

.1 Sidewalks: broom finish.

.2 Repairs to soffits, abutments, and retaining walls: rough finish.

.3 Approach slabs: rough finish.

.4 Elsewhere: smooth finish.

.6 Joint fillers:

.1 Furnish filler for each joint in single piece for depth and width required for joint, unless otherwise authorized by the Ministerial Representative.

.2 When more than one piece is required for joint, fasten abutting ends and hold securely to shape by stapling or other positive fastening.

.3 Locate and form isolation construction expansion joints as indicated.

.4 Install joint filler.

3.3 SURFACE TOLERANCE

.1 S'assurer que les surfaces soient lisses, continues et uniformes.

3.4 PROTECTION

.1 Protection and curing of placed concrete must be done in accordance with the following requirements in addition to the requirements of the cold weather CAN/CSA-A23.1/A23.2 standard.

.1 Protect the concrete with a windproof shelter such as a tarpaulin or other material to allow free circulation of air around the inside of freshly poured concrete.

.2 Do not allow contact between the shelters and the walls of the formwork.

.3 Provide sufficient space for removal of formwork for finishing.

.4 Use heating equipment approved by the Ministerial Representative.

.5 Ventilation products of the protective shelters: The equipment must be able to keep the inside air warm enough to main the following concrete cure temperatures constant:

.1 For the first three days: minimum temperature of 15 °C, maximum of 27 °C on concrete surfaces.

.2 For concrete abutments, solid piers, and bases: curing at 10 °C for an additional four (4) days.

.3 For superstructures: maintain concrete at a minimum of 10 °C for an additional fourteen (14) days.

.6 Keep concrete surfaces continuously wet and protected.

.7 Provide misting equipment to allow curing with spray mist before the start of the bridge deck installation.

.2 Surfaces without formwork: curing with burlap and water.

.1 Place two layers of wet burlap on the concrete surface.

.2 Overlap each strip a minimum of 75 mm and secure against movement by the wind.

.3 Keep burlap in place and keep moist for seven (7) days after placement.

.3 Surfaces with formwork:

.1 No additional curing is required if the formwork is left in place for seven (7) days or more.

.2 If the formwork is removed within seven (7) days, cure concrete as indicated for surfaces without formwork for the rest of the seven-day period.

.4 During the curing period, only uncover those areas necessary for the finishing treatment. Cover and continue to cure.

3.5 FIELD QUALITY CONTROL

.1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength at 7 and 28 days.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by the Ministerial Representative for review to CSA A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Ensure test results are distributed for discussion at pre-pouring concrete meeting between testing laboratory and the Ministerial Representative.

.4 The testing laboratory will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.5 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

3.6 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Prepare a Waste Reduction Workplan (WRW) according to Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.2 Divert unused concrete materials from landfill to local quarry facility after receipt of written approval from the Ministerial Representative.

.3 Provide appropriate area on job site where concrete trucks and be safely washed.

.4 Divert unused admixtures and additive materials (pigments, fibres) from landfill to official hazardous material collections site as approved by the Ministerial Representative.

.5 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.

.6 Prevent admixtures and additive materials from entering drinking water supplies or streams.

.7 Using appropriate safety precautions, collect liquid or solidify liquid with inert, noncombustible material and remove for disposal.

.8 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 03 10 00 – Concrete forming and accessories

.2 Section 03 20 00 – Concrete reinforcing

.3 Section 03 30 00 – Cast-in-place concrete

1.2 REFERENCES

.1 Unless otherwise indicated, execute all concrete rehabilitation works in accordance with the requirements of the following standards:

.1 CSA International:

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CAN/CSA-269.1-1975 (R1998), Falsework for Construction Purposes.

.3 CAN/CSA-S269.3-M92 (R2013), Concrete Formwork.

.4 CAN/CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.

.5 CAN/CSA G30.3-M1983 (R1998), Cold-Drawn Steel Wire for Concrete Reinforcement.

.6 CAN/CSA-G30.5-M1983 (R1998), Welded Steel Wire Fabric for Concrete Reinforcement.

.7 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.2 American Concrete Institute:

.1 ACI 304.2R-96, Placing Concrete by Pumping Methods.

.2 ACI 546.1.R-80, Guide to Repair of Concrete Bridge Superstructures.

.3 ASTM International

.1 ASTM E488/E488M-10, Standard Test Methods for Strength of Anchors in Concrete Elements.

.4 Ministère des Transports du Québec :

.1 Liste des matériaux relatifs au béton éprouvés par le laboratoire des chaussées, 2012.

.2 Cahier des charges et devis généraux, Infrastructures routières, Construction et réparation, Édition 2013, Gouvernement du Québec.

.3 Normes Ouvrages routiers, Tome VII, Matériaux, Gouvernement du Québec.

1.3 UNIT PRICES

.1 The rehabilitation will be paid based on actual quantities measured on site and unit prices indicated in the Tender Form and acceptance:

.1 Concrete rehabilitation will be paid per square meter. The unit price includes demolition and surface preparation, adding reinforcement, when required, the supply and placing of concrete, formwork, curing, sandblasting, and correction of faulty repairs.

.2 Crack injection will be paid per linear meter or square meter of the surface area of cracks to be injected as specified in the Tender Form, measured from the first injection port to the last injection port. The unit price includes the provision of a work plan for the injection of the cracks, products and equipment, cleaning and preparation of the surfaces, the installation and removal of the sealing products, and testing.

1.4 DOCUMENTS/SAMPLES REQUIRED

.1 Submit the documents and samples required under section 01 33 00, *Documents and Samples*, to the ministerial representative no later than ten (10) days prior to the commencement of work.

.2 Provide a work plan for the injection of the cracks, including a detailed description of the products and the proposed injection method. Include technical data sheets of the products and materials, the make and model number of the pressure gauge, including a certificate of calibration dated no more than 12 months prior to the date of the rehabilitation works.

1.5 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with section 01 45 00 – Quality Control.

.2 Chemical Anchors:

.1 Before beginning the installation of chemical anchoring, install three (3) dowels for chemical anchors in areas designated by the ministerial representative.

.2 Perform pull tests on the dowels in accordance with ASTM E488 in the presence of the ministerial representative.

.3 If the pullout capacity of the dowels is less than the elastic limit shown on the plans, modify the anchoring method and redo the dowel pull tests on new dowels.

.4 Repair all concrete surfaces damaged during the pull tests.

1.6 SITE CONDITIONS

.1 The site in the working area will not be dry. Ensure suitable dryness for the demolition works, for the placement of rehabilitation materials, for hardening, and for crack injection by means such as cofferdams, sandbags, and pumps. Keep the equipment ready in case the weather might cause a rapid increase in water infiltration.

.2 Crack injection should not be performed when the concrete temperature is lower than 15 °C or above 30 °C.

Part 2 Products

2.1 MATERIALS AND EQUIPMENT

.1 Portland cement: to CAN/CSA-A3000 standard, GU type.

.2 Water: to CSA-A23.1.

.3 Aggregates: to CSA-A23.1/A23.2.

.4 Dry Unmixed Grout: product containing Portland cement with nonmetallic aggregate and sufficient water to be able to hold its shape when made into a ball with one's hands, and able to reach a compressive strength of 35 MPa in 28 days.

.5 Binding Agent (adhesive):

.1 Binding agent (adhesive) on the surface of existing concrete before pouring: slurry composed of latex, cement, and water mixed in the following proportions:

.1 3 kg of cement, GU type

.2 7.5 liters of latex

.3 About 2.5 liters of water to obtain a creamy consistency.

.6 Crack Injection Product:

.1 Cracks in soffits: epoxy.

.2 Cracks elsewhere: polyurethane.

.3 Included in the list of patching materials meeting the "A Laboratory Evaluation of Concrete Patching Materials" standard.

.4 The injection product must be less than 12 months old.

.5 Deliver injection products in the original packaging with the date of manufacture.

.7 Chemical Anchors:

.1 Use a two component injectable adhesive for installation of all reinforcing dowels in the existing concrete.

.2 Minimum compressive strength: 50 MPa.

.3 Included in the "Dowel Adhesives" list of the "Designated Sources for Materials" document published by the Ministry of Transportation of Ontario and available on "The Road Authority" website.

Part 3 Execution

3.1 GENERALITIES

.1 Before commencing work, the ministerial representative will determine and delineate, in the presence of the Contractor, the concrete to be demolished.

.2 Provide the ministerial representative with all necessary safety equipment to allow him/her to identify the areas to be demolished and to inspect the affected surfaces.

3.2 CONCRETE DEMOLITION

.1 Take all necessary precautions not to damage the parts of the concrete to be preserved during the demolition works. To this end, use pneumatic demolition hammers permitted by article 2.2.1.

.2 Before beginning work, provide the ministerial representative with the technical data sheet of the proposed equipment and of the proposed safeguards.

.3 Before starting the demolition, execute a saw cut of approximately 20 mm in depth to delimit the work zone for any category of demolition. Take all necessary precautions to ensure that the saw used to make the cut demarcating the demolition area does not touch the reinforcing steel.

.4 If due to carelessness, the reinforcement to be preserved is damaged and cannot be reused, the Contractor must replace the reinforcement at his expense.

.5 Clean demolished surfaces with a pressurized water jet. This cleaning must remove the small pieces of concrete that are not fully adhered to the surface and provide a rough surface for better adhesion to new concrete.

.6 After the final cleaning of the pressure washed surfaces, the ministerial representative must examine the state of the remaining concrete to ensure that there are no loose particles.

3.3 SURFACE PREPARATION

.1 The exposed surfaces shall be clean and free from loose and friable particles.

.2 The ministerial representative shall approve the exposed surfaces before the beginning of the pouring of concrete.

.3 Keep the surfaces wet for a period of at least 8 hours before the pouring of the concrete and remove all accumulations of water. Surfaces must be superficially dry before the pour.

3.4 BONDING AGENT APPLICATION

.1 On the areas demanded by the ministerial representative, the bond between the old and the new concrete must be improved by the application of the described bonding agent. If the bonding agent is dry at the moment of the pour, the surface must be cleaned again with a water jet and a new coat of bonding agent must be applied.

3.5 CONCRETE FABRICATION

.1 Supply this ready mixed concrete, plant fabricated, delivered, and discharged on site as required by section 18 of the CSA A23.1.

.2 For each load of concrete, the concrete supplier must provide the ministerial representative with a copy of the delivery slip. The following information will appear on the slip:

.1 Company name and address of the supplier

.2 Truck number

.3 Name of the Contractor
.4 Name and location of project
.5 Concrete class
.6 Cumulative quantity
.7 Unloading start time
.8 Unloading end time
.9 Maximum size of aggregate
.10 Required air content
.11 Types of additives used
.12 Amount and type of cement
.13 Amount of water.

.3 Comply with indications of section 20 of CSA-A23.1-M90 standard regarding construction joints. Execute shear keys on the entire length of any construction joint. Those keys shall have a width equal to one-third of the section thickness and a depth equal to one-sixth of that thickness, to a maximum of 100 mm. Slightly bevel sides of shear keys.

3.6 FINISHING OF FORMED SURFACES

.1 Protect and cure concrete in accordance with Article 21 of the CAN/CSA A23.1. In cold weather, protect concrete. The use of the curing products is prohibited.

.2 Concrete surfaces without formwork:

.1 Unless otherwise noted, finish unformed concrete surfaces in accordance with Article 22 of the CAN / CSA A23.1.

.3 Finishing of surfaces with formwork:

.1 Finish surfaces with formwork in accordance with Section 24 of the CAN/CSA-A23.1.

.2 Fill holes left by formwork ties with a non-shrink grout. Only fill the hole without staining the surrounding surface.

3.7 NEW CONCRETE REHABILITATION

.1 All damaged or defective concrete shall be removed and replaced by concrete that complies with prescriptions of the plans and specifications and according to the ministerial representative's instructions.

.2 After the removal of forms, the ministerial representative will examine air pockets, honey combs, and other defects. The Contractor shall submit for the ministerial representative's approval the rehabilitation methods for air pockets, honey combs, and other defects, if any. The Contractor shall not proceed with any surface correction before the ministerial representative's approval.

3.8 CRACK INJECTION

.1 Patch cracks in the concrete by pressurized injection.

.2 Inject the entire length of cracks having opening greater than or equal to 0.8 mm or as indicated by the ministerial representative.

.3 Perform injection of cracks in accordance with the crack injection work plan.

.4 Provide written notice to the ministerial representative:

.1 At least 24 hours prior to the injection of cracks.

.2 At least 24 hours before the resumption of crack injection if the injection was suspended for at least 24 hours.

.5 Clean surfaces adjacent to cracks with a wire brush to free them of dirt, oil, efflorescence, and other foreign matter.

.6 Patch cracks by injecting the product into the injection ports.

.7 Injection Ports:

.1 Set perpendicular to the face of concrete, without drilling into concrete.

.2 Separate injection ports by a distance which is not greater than the thickness of the element, and where the crack is clean and widest.

.3 Spacing of the first and last injection ports should be half of the regular spacing.

.4 Use at least two injection ports per crack.

.5 Cover cracks between the injection port with the sealant with a width of at least 50 mm.

.6 Test sealing of the injection ports and cracks by injection of compressed air at 500 kPa. If the air pressure falls within one minute after the injection, replace the defective piece and repeat the test until the pressure is maintained. Use an air injection equipment with a filter to trap the oil.

.8 The engineer responsible for the preparation of the crack injection work plan must be present for the injection of the first crack to ensure that work is progressing according to the crack injection work plan.

.9 Inject the remaining cracks only when it is demonstrated to the satisfaction of the ministerial representative that the first crack is properly injected.

.10 Inject vertical or inclined cracks starting from the lowest injection port. Inject horizontal cracks from one end.

.11 Ensure that the injection nozzle pressure is less than 345 kPa.

.12 Injection process:

.1 Inject the crack continuously.

.2 Inject the first injection port until the injection product no longer flows and the maximum pressure is maintained for at least ten minutes.

.3 Close injection ports when the injection product begins to leak.

.4 After at least ten minutes at constant pressure and zero flow to the first injection port, proceed to the injection port furthest from where the injection product has leaked.

.5 Repeat the process until the injection product has filled all injection ports.

.13 Stop injection and clean all equipment and accessories if the injection ceases for more than 75% of the duration of its usage.

.14 If microcracks appear near a crack during injection, immediately stop the injection.

.15 Stop injection and correct sealing of the cracks immediately if the product begins to leak from the crack at any place other than an injection port.

.16 Once the injection product has sufficiently hardened, remove sealant injection ports and any leakage or splashing of the injection product from the surface of the existing concrete, but not less than 24 hours after the end of the injection.

3.9 CHEMCIAL ANCHORS

.1 Drill holes to depths required by the manufacturer of the chemical anchoring adhesive for the elastic limit set out plans for a concrete of 31 MPa.

.2 Minimum depth of holes: 200 mm.

.3 Drill holes on vertical surfaces inclined at 15 ° to the horizontal, below the orifice.

.4 Brush holes to a clean state and blow using a compressed air jet just before the injection of the chemical anchoring adhesive. Insert the air jet hose into the hole.

.5 Inject the chemical anchoring adhesive in the hole. Inject an amount sufficient to completely fill the space between the dowel and the hole over the entire length of the hole.

.6 Insert a clean dowel free of any grease into the bottom of the hole.

.7 Prevent disturbance of the dowel during the curing period.

3.10 WINTER CONDITIONS

.1 Some concrete works in Appendix 1 (Volume VII, Chapter 3), can be executed in cold weather and may require heating, hoarding, or insulation.

.2 The temperature of the plastic concrete at the time of concrete pouring must comply with the requirements of standard 3101 of the Ministry of Transport of Quebec, presented in Appendix 1, *Bétons de masse volumique normale*.

.3 The heating of the shelter must meet the guidelines in this section and the requirements of CSA A23.1/A23.2, *Concrete materials and methods of concrete construction/Test methods and standard practices for concrete*, with respect to the temperatures of materials adjacent to repairs during concreting, the concrete components, and the temperature during the curing of concrete.

.4 Maintain a minimum temperature of 10 °C for a minimum period of seven (7) consecutive days after pouring.

.1 Extend the period of concrete protection as long as the concrete has not reached 70% of the compressive strength required at twenty-eight (28) days.

.5 After the period of protection, gradually lower the temperature of the concrete during the first twenty-four (24) hours.

.1 The rate of temperature decrease should not exceed 10 °C/hour.

.2 Do not put the concrete in contact with the outside air if the temperature difference of the concrete and the outside air is greater than 20 °C.

.6 The requirements for concrete curing apply regardless of the type of protection in place.

.7 All concrete that freezes is not paid and is refused. The part of the structure built with this concrete is considered defective and must be rebuilt according to the plans and specifications at the Contractor's expense.

.8 Existing concrete, reinforcement, and formwork:

.1 The use of sodium chloride or calcium chloride as a de-icing agent is prohibited.

.2 In the case of concrete pouring in the open, all surfaces (existing concrete, reinforcements, formwork, etc.) with which the plastic concrete comes into contact must be heated to a minimum temperature of 0 °C beforehand.

.9 In the case of pouring concrete under a hoarding or shelter, heat to maintain a temperature between 0 and 20 °C on the contact surfaces for a period of at least 24 hours prior to pouring.

.10 Keep formwork in place for the duration of the protection period and the surfaces with formwork at a temperature between 0 and 20 °C throughout the duration of the protection.

.11 Types of protection

.1 Insulation

.1 Use insulating material to cover the surface of the plastic concrete.

.1 Each layer of insulating material shall be of waterproof cover type, made from closed-cell foamed pads and have a thermal resistance RSI of 0.40.

.2 The day before pouring, the ministerial representative must approve the number of layers of insulating material to install.

.1 Based on the changing temperature of the concrete during the protection, the ministerial representative may require the Contractor to reduce or increase the number of layers; the removal or the addition of a layer must be made within three (3) hours following the request of the ministerial representative.

.3 Ensure that the insulation is installed in such a way that it prevents exposure of the concrete surfaces to the outside air for the duration of protection.

.4 The joints of the insulation blankets must have an overlap of at least 75 mm.

.5 The insulation is paid in the Tender Form at the item corresponding to the insulation (RSI 0.40 per layer).

.12 Temporary Shelter / Hoarding

.1 Construct protective shelters that surround structures.

.2 At least two (2) weeks before the start of concreting under protective shelters, prepare and submit an implementation plan for these shelters.

.3 Install the shelter so as to cover the surfaces of the structure to be concreted with canvas and tarpaulins.

.1 These covers must be watertight, durable, and securely fastened so as not to move for the duration of the protection.

.4 Ensure that the shelter has a height and a sufficient size to allow the pouring, curing, and finishing of the concrete within the shelter.

.5 The shelter is paid in the Tender Form at the item corresponding to the temporary shelter.

END OF SECTION

Part 1 Generalities

1.1 GENERAL CONDITIONS

.1 The Contractor shall comply with all the specifications in this section in addition to those contained in any other document of the tender.

1.2 REFERENCES

.1 Bureau de normalisation du Québec (B.N.Q.) (latest edition) :

.1 BNQ 1809-300/2004 (R 2007) : Construction work – General Technical Specifications – Drinking Water and Sewer Lines.

.2 Ministère des Transports du Québec (MTQ)

.1 CCDG 2014, Cahier des charges et devis généraux.

.2 Collection *Normes - Ouvrages Routiers* du MTQ

1.3 PAYMENT

.1 All work payment methods are described in section 01 29 00 - Payments.

1.4 PAVEMENT PRICE

.1 The specifications concerning pavement price adjustment from CCDG (latest edition), will apply. The reference price for the calculation of the nominal price of pavement (excluding transportation) shall be:

PG 64-34: 887.00 $/ton of pavement

1.5 DEFINITIONS

.1 Wherever the following words and terms are indicated, they are expected to have the following meanings, unless the context indicates something different:

.1 Ministerial representative: legal person who, for his technical ability, is mandated by the Owner to monitor works, control quantities and quality, look after materials reception and settlements;

.2 Laboratory: physical or legal person who, for his technical ability, is mandated by the Owner to perform qualitative tests on materials and to look after their implementation;

.3 Contractor: legal person whose tender is accepted by the Owner (or assigns as a contracting party with the owner) and who is responsible for the execution of the entire work;

.4 Owner: City or Corporation who requesting bids and giving contract for the concerned works. In this contract the owner is Parks Canada Agency;

.5 Director: person responsible for the contract and directly involved in the contract decisions. He represents the owner in the contract, when required, or, in the absence of the director;

.6 Supervisor or Engineer: natural person who, by his technical ability, is the site Engineer who look after the work and control the quantities and work quality;

.7 Subgrade limit: natural ground or fill level who must be shaped to receive granular materials;

.8 Sewer: sanitary sewer systems, storm sewers and combined sewer;

.9 Aqueduct: Network of pipes and accessories for transporting drinking water from one place to another;

.10 AWWA : American Water Works Association;

.11 ASTM : American Society for Testing and Materials;

.12 CSA : Association Canadienne de Normalisation;

.13 ASA : American Standards Association;

.14 BNQ : Bureau de Normalisation du Québec;

.15 ULC : Under-Writers' Laboratories of Canada;

.16 FM : Factory Mutual;

.17 PM: Modified Proctor density test according to CAN / BNQ 2501-255 "Soils - Determination of relative water content - Density - Modified Proctor Test" standard;

.18 AASTHO : American Association of State Highway and Transportation Officials;

.19 CGSB : Canadian Government Specification Board;

.20 ACLE : Association Canadienne des Laboratoires d'essai;

.21 ONGC : Office des Normes du Gouvernement Canadien;

.22 Aggregates: a mixture of natural and / or manufactured elements from various nature and dimension;

.23 Asphalt: asphalt binder used in hot asphalt preparation;

.24 Slope x : y (horizontal : vertical);

.25 MTQ XXXX : standards number XXXX from Ministère des Transports du Québec, including latest revisions from general specifications;

.26 LC XX - XXX : standards number- XXX from Laboratoire des chaussées du Ministère des Transports du Québec (latest edition);

.27 CCDG : Quebec Ministry of transportation general standards and specifications (latest edition), including latest addendum;

.28 CSA A23.1 : standard CSA A23.1-94 « Concrete – Components and work execution »;

.29 CSA A23.2 : standard CSA A23.2-94 « Concrete tests »;

.30 ACNOR : Canadian Standard Association.

.31 NQ : standards from Bureau de normalisation du Québec (BNQ).

.2 Whenever a term is used in this section to refer to a standard, it should be understood that reference is made to the most recent revision of this standard.

1.6 WARRANTY PERIOD

.1 For the entire works, the warranty period is twelve (12) months after the issue of the substantial completion certificate (works provisional acceptance).

1.7 SITE AND EMPLOYEES ACCESS

.1 The Contractor shall provide in its tender the costs associated with the construction and maintenance of temporary access roads required to perform its work in accordance with the access to the site conditions.

.2 The Contractor shall provide at all times a suitable and safe access, to the satisfaction of the ministerial Representative, for employees and emergency services (fire, police, ambulance, etc.).

.3 The Contractor shall provide at all times a free lane for road users during construction. The Contractor shall provide in its tender the costs associated with maintenance, signalization and support of this work throughout the construction period.

1.8 SITE OBSERVATION

.1 No surveillance will be provided by the Owner on site. The Contractor shall provide by himself the safety of his materials and equipment during the construction period and until their provisional acceptance.

.2 No claim for damages will be accepted by the Owner.

1.9 MAINTENANCE, CIRCULATION AND ROAD SIGNS

.1 The Contractor shall install two (2) special road signs where the two (2) site entrances are, approved by the ministerial Representative. Those road signs must indicate the period of work in the two (2) official languages:

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.2 When a traffic lane must be closed or a traffic diversion must be scheduled, the Contractor shall make a written request accompanied by a drawing showing the site location and the proposed diversion. This request is necessary to obtain permission from all departments, owner and / or municipal and provincial authorities involved in this work, within 48 hours.

.3 The Contractor shall provide adequate road signs using barricades, flashing, warning, etc... During work, and twenty-four (24) hours per day, to the satisfaction of the ministerial Representative and upon signaling standards of short-term work of the Ministry of Transport.

.4 The Contractor shall proceed with the repair of the site he had or he shall use, damage, break, disturb, move around or for the execution of the work at his own expense.

.5 If the Contractor does not install appropriate signs, as required by documents described above, the Owner may send at any time and without notice a team to install the required

road sign on site until the Contractor has properly do his works. The costs incurred will be deducted from the Contractor's count.

.6 All these works will be completed to the satisfaction of the ministerial Representative and the cost of all this work will be the Contractor's expenses.

.7 The Contractor shall maintain the site free of dust and proceed as needed or requested by the ministerial Representative, the application of water. The Contractor shall also ensure the cleanliness of roads traveled by trucks. It shall at all times keep in operation a tanker for watering.

.8 If the Contractor fails to comply with this clause, the ministerial Representative may, after giving 24 hours' notice, execute the cleaning and / or water application by another contractor. All costs will be incurred to the main Contractor.

.9 Costs for spraying water and street cleaning with a mechanical broom should be included within the bid. No special compensation will be granted for these activities.

.10 At any time, the Contractor shall comply with the municipal laws and the regulations concerning the safety of road signs on the edge of highways.

.11 The Contractor shall submit, for approval, at least ten (10) working days before the beginning of construction works, a plan for traffic management to the ministerial Representative. All drawing signs, detour and lane closure shall comply with the standards of road works (Volume V, Volume 1, Road Sign MTQ). Before every change to the traffic management signalization, the Contractor shall submit for approval a revised plan for traffic management to the ministerial Representative. The documents required include:

- .1 Works description;
- .2 Location drawing;
- .3 Works schedule;
- .4 Temporary circulation drawing (detour, deviation…) including appropriate scale and date;
- .5 Signalization and temporary marking drawings.

1.10 WORK DONE BY OTHER

.1 The Contractor must know Hydro-Quebec's works. Hydro-Quebec will realise the construction of an overhead power line. The location of these works is approximately ch: 0 +400 to ch: 2+110. Hydro-Quebec's preliminary schedule (to be confirmed) works is:

Tree clearing: April 28th to May 15th 2014

Poles and anchors: September 8th to October 10th 2014

Line works: October 13th to December 19th 2014

.2 The Contractor is responsible to make contact with Hydro-Quebec and to coordinate all their work with his. The Contractor must allow enough construction area to Hydro-Quebec for them to perform their works. Costs to comply with these constraints must be included in the submission.

1.11 WORK SURVEILLANCE

.1 All work performed by the Contractor shall be performed under the supervision of the ministerial Representative.

.2 The Contractor must notify the ministerial Representative at least twenty-four (24) hours before the start or the reprise of the works.

.3 If the Contractor fails to notify the ministerial Representative, the Contractor shall demonstrate, to its expenses and to the ministerial Representative's satisfaction, all work done in the absence of an inspector is realized upon plans and standards.

.4 The Owner has the right to require from the Contractor to restart, at his expenses, all works that it has been done without the supervision of an inspector of the ministerial Representative.

.5 After a second inspection of the same work judged deficient by the Engineer, the Contractor shall pay for all the expenses of coordination, monitoring and inspection.

.6 The Contractor shall provide to the civil supervisor a trailer, a cell phone and water.

.7 However, for the work done in the footprints of the two (2) public utility companies (Hydro-Quebec and Telus), monitoring works are carried out jointly by the ministerial Representative and the agencies representatives, at the expense of the owner, unless otherwise specified.

1.12 MATERIALS

.1 The Contractor is responsible for the preservation of all materials during transport, handling and storage and shall at all times take the necessary precautions to minimize energy consumption.

.2 The Owner refuses all damaged materials that are not compliant with standards and the Contractor must carry out, at its own expenses, those materials off the site limits.

.3 However, if the Contractor believes it can, by appropriate operations, make acceptable those defective materials, the ministerial Representative may authorize the attempt, but if it fails, the Contractor shall be responsible for any loss.

.4 Different material sources and quality should be stored separately so full and fast inspection can be done at all time.

.5 No materials to be stored or no Contractor's equipment shall be placed where they could cause danger to the circulation.

.6 The Contractor must obtain and develop, at its expense, all the land necessary for the safe storage of materials and equipment.

1.13 PROPOSED ELEVATIONS

.1 The ministerial Representative has the right to change the elevation attached to this document. Indeed, the Contractor may not submit any claim for elevation changes of 150 mm or less. The Contractor has been notified 48 hours for all changes.

1.14 AVAILABILITY OF WORK LOCATION

.1 Except work limits, section 2 limits, some parking lot limits and diurnal area limit (outside the high season and if authorized by the ministerial Representative), the Contractor may not built storage area within the limits of Forillon National Park.

.2 The Contractor shall take the necessary measures during construction to ensure that its equipment, materials and labor remain inside the Owner's property.

1.15 VIDEO RECORDING

.1 Before starting work, the Contractor shall give to a specialist the need to make a quality video recording of the site work and natural ground around.

.2 The record must include a view and a description of all trees, structures, fences, existing elements and anything that could become subject to claims for damages.

.3 No excavation work is allowed before the delivery of two (2) DVD video recording copies to the ministerial Representative. The Contractor shall keep the original recording for his personal use. These costs should be included into submission.

1.16 EXCAVATION

.1 The Contractor shall reuse excavated material first, accepted by the ministerial Representative, as backfill.

.2 Loading, transportation and disposal of non-reusable backfill excavation surplus shall be at the Contractor's expense and shall comply with directives of the MDDEFP (Ministry of Sustainable Development, Environment, Wildlife and Parks).

1.17 LOCATION OF EXISTING SERVICES

.1 Position of utilities shown on the drawings has been established as a result of a compilation of all available data relating thereto. Before undertaking excavation, the Contractor shall call the existing utility services to obtain the most recent plans "as built". The Contractor shall obtain a written confirmation of the services' location and send a copy to the ministerial Representative.

.2 The Contractor shall respect the companies' standards and special conditions to work near their infrastructures. Costs to comply with these conditions, as well as to obtain permits, if required, must be included in the submission.

.3 The Contractor shall be responsible to take all measures to locate and identify these services and all damage to public utilities.

1.18 INFO-EXCAVATION

.1 Before any work excavation, the Contractor has the responsibility and obligation to contact Info-Excavation (1 800 663-9228) in order to locate the companies concerned, underground services on the site of the work.

.2 Repair broken items indicated on the drawings shall be paid by the Contractor.

1.19 ENVIRONNEMENTAL PROTECTION

.1 The Contractor shall not exceed the limits of work. He must also pay special attention to protect trees and shrubs near the working area.

.2 Trees, bushes or shrubs damaged during work should be repaired at the expense of the Contractor and accepted by the Ministerial Representative.

.3 If the damage is too great, damaged trees, shrubs or bushes must be replaced at no extra cost, by accepted units from the Ministerial Representative.

1.20 EXISTING ROAD SIGNS

.1 The Contractor shall remove and replace, if needed, the road signs shown or not on the drawings, but identifiable at the site visit.

.2 The Contractor shall remove the supports of existing road signs and dispose them in a site approved by the Ministerial Representative.

.3 All costs associated with this work shall be included in the submission.

1.21 PROTECTION OF EXISTING STRUCTURES

.1 The Contractor must not trespass, move along, leave materials or execute work on existing structures without the authorization of the Ministerial Representative. He must also pay special attention to protect structures located near work.

.2 Any existing damaged structures during work must be repaired by the Contractor, at its own expense and within a period of 24 hours. Otherwise the Ministerial Representative has the right to contact another Contractor to perform the repairs and he can subtract to the progressive count the sums involved.

1.22 NATURAL GROUND DISRUPTION REDUCTION

.1 These following measures will be used on site:

.1 The soil located outside the work zone will be compacted to a minimum.

.2 The disruption of unbuilt areas of the site will be minimized. Existing slopes and levels will be retained upon the Ministerial Representative instructions and wherever possible.

1.23 WORK AND EASEMENT ACCESS

.1 Before work, the Contractor must obtain all temporary land access, passage or construction easement. He must also ensure that all the work is located within the boundaries shown on drawings and / or specified in the contracts easements.

.2 The Contractor remains responsible for damage to private property, whether or not he signed arrangement with the owners concerned.

1.24 SUB-CONTRACTING

.1 The Contractor is responsible for coordination with subcontractors and between subcontractors. No direct correspondence will be done between the ministerial

Representative and subcontractors of the Contractor. No claim on the Coordination between the Contractor and its subcontractors shall be permitted.

.2 It is the responsibility of the Contractor to ensure that all items requested on drawings and specifications are included in the subcontractor's submission (via BSDQ). If items are missing in the bids of subcontractors, the Contractor shall include those items in the bid submitted to the Owner.

1.25 WORK LINE

.1 The Contractor is the only responsible for realizing the project, taking all measures and making full coordination.

.2 The consequences of incorrect work lines are the responsibilities of the Contractor. The Contractor shall prepare point list before excavation. The natural ground profile can be changed on the site to improve drainage. Coordination must be completed during all work long with all stakeholders.

.3 If required, the point list must to be provided to the Ministerial Representative before the work begins. All the elements to implement must be provided.

.4 The Contractor must realize a full survey for the proposed construction elements.

.5 The Contractor must realize a survey with required lines and levels for any elements to build with length over 15 m.

.6 The Contractor must execute the grading and provide technical information to the Ministerial Representative relative to picket on standard lists including chaining, existing pavement elevation, pole head elevation, proposed paving and sidewalks elevation, the difference between the existing and the proposed paving, as well as the slope between the two.

.1 Perform chaining offset along the projected elements.

.2 Identified with benchmarks every 10 m, the beginnings and ends of curves, high points and low points, etc.

.3 Include costs of these survey works in its bid.

.7 The Contractor shall provide after culverts work and before paving work, the survey of culverts to the Ministerial Representative for validation. Once the Ministerial Representative has validated all the works, the Contractor will be authorized to proceed with backfilling and paving works.

.8 Once all the works is done, the Contractor must realize the survey of all constructed items and provide, 1 month after the end of works, a point list file (x, y, z) of all elements built in AutoCAD ("dwg" format).

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 31 00 00 – Generalities (civil)

.2 Section 31 23 11 – Excavation and backfilling

1.2 SCOPE OF WORK

.1 Provide supervision of the works, all manpower, equipment, tools, materials , transportation and other services necessary to conduct and complete all work specified in this section and in the contract documents, including, but not limited to: clearing, grubbing , grubbing trees of all sizes, from all strains only located in the work area to be previously approved by the Ministerial Representative of all shrubs and bushes , branches, etc., excavation, stripping and storage canopy for later reuse, backfilling with compliant granular material and compaction of specified surfaces for the preparation of various works of this contract and the implementation of protective coatings stone .

.2 The Contractor shall thoroughly clean the work area of all materials coming out from deforestation, grubbing and underbrush clearing he performed or resulting from work previously done. Deforestation includes the total removal of any tree, stump, etc. However, the Contractor shall strictly limit deforestation to areas affected by the work that must first be approved by the Ministerial Representative. The Ministerial Representative must approve areas affected by deforestation before the Contractor begins deforestation. Everything must be loaded, transported and disposed to a site in accordance with the Soil Protection and Contaminated Sites Rehabilitation Policy of Minister of Sustainable Development, Environment, Wildlife and Parks (MDDEFP). Unless otherwise instructed, the topsoil is primarily collected and put in a pile for later use in revegetation of some areas.

.3 The coarse removal is to cut the trees and brush to a height above the ground not exceeding the prescribed height, and remove the giblets, windthrow, stumps and debris littering the ground.

.4 Close cut clearing means to cut, flush or near the existing ground level, standing trees, brush, shrubs, roots, stumps and logs partially buried, and removing the giblets and debris littering the ground.

.5 Underbrush clearing involves removing brush, dead wood and trees with a trunk diameter less than 50 mm, and removing the giblets and debris.

.6 Grubbing is grabbing stumps and roots to a depth below the existing level but now lower than the prescribed one and removing these materials. The grubbing shall be realized inside the work limits and inside the limits of section 2, as approved by the ministerial Representative.

1.3 STORAGE AND PROTECTION

.1 Prevent damage to trees, landscaping, natural features, bench marks, water courses, root systems of trees which are to remain.

.1 Repair damaged items to approval of Ministerial Representative.

.2 Replace trees designated to remain, if damaged, as directed by Ministerial Representative.

1.4 DEFORESTATION

.1 Clearing activities include, but are not limited to, providing equipment and manpower needed to achieve, according to good practice, the site clearing according to specifications on plans including:

.1 Logging strictly in the area of work approved by the Ministerial Representative.

.2 Loading, transport and disposal of debris to a site in accordance with the MDDEFP Soil Protection and Contaminated Sites Rehabilitation Policy.

1.5 CLEARING AND GRUBBING

.1 Clearing and grubbing include, but not limited to, material and manpower needed to achieve, according to good practice, clearing and grubbing, for woodlands, wetlands or other, according to specifications on plans including:

.1 Coarse removal, ground clearing, grubbing;

.2 Storage of topsoil and humus for later reuse;

.3 Excavation drainage and dewatering, in accordance with section 32 23 11 - Excavation and backfilling.

.4 Loading, transport and disposal of debris and excess debris to a site complies with the MDDEFP Soil Protection and Contaminated Sites Rehabilitation Policy.

.5 Cleaning wood chips from grubbing works.

Part 2 Products

2.1 WASTE MANAGEMENT AND DISPOSAL

.1 The Contractor must supply the address where clearing and grubbing material will be piled. The site will comply with the MDDEFP Soil Protection and Contaminated Sites Rehabilitation Policy.

Part 3 Execution

3.1 PREPARATION

.1 Inspect site and verify with Ministerial Representative, items designated to remain. Notify utility authorities before starting clearing grubbing.

.2 Identify and delineate areas for topsoil storage.

3.2 CLEARING

.1 Cut at height of not more than 300 mm above ground. In areas to be subsequently grubbed, height of stumps left from clearing operations to be not more than 500 mm above ground surface. Cut off branches and cut down trees overhanging area cleared.

3.3 CLOSE CUT CLEARING

.1 Close cut clearing to ground level to within 100 mm of ground surface.

.2 Perform close cut clearing by hand so that existing muskeg is not damaged.

3.4 UNDERBRUSH CLEARING

.1 Clear underbrush from areas as indicated at ground level.

3.5 GRUBBING

.1 Grub out stumps and roots to not less than 200 mm below ground surface.

.2 Grub out visible rock fragments and boulders, greater than 300 mm in greatest dimension, but less than 0.25 m^3.

3.6 REMOVAL AND DISPOSAL

.1 Remove cleared, grubbed materials off site to disposal area in accordance with MDDEFP Soil Protection and Contaminated Sites Rehabilitation Policy.

3.7 FINISHED SURFACE

.1 Leave ground surface in condition suitable for immediate grading operations stripping of topsoil to approval of Ministerial Representative.

3.8 TOPSOIL REMOVAL

.1 Begin topsoil and humus removal in working areas after clearing, underbrush clearing and grubbing. Unless otherwise indicated, remove the entire thickness of topsoil and humus within the construction area.

.2 Topsoil or any other plant debris must be removed as directed by the Ministerial Representative.

.3 This clearing is part of 2nd class cuttings, even if the work requires it to be done separately or by material sorting.

.4 Place topsoil and humus, reusable in the project in pile where indicated and protect in order to prevent contamination. The height of the pile shall not exceed 2 m.

.5 Dispose topsoil overs that cannot be reused in the project in a site in accordance with MDDEFP Soil Protection and Contaminated Sites Rehabilitation Policy.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 00 00 – Civil Generalities

.2 Section 31 11 00 – Clearing and Grubbing

.3 Section 32 11 00 – Roadworks

.4 Section 33 31 00 – Culverts

.5 Section 32 91 21 – Civil Topsoil and Earthwork

1.2 SCOPE OF WORK

.1 Ensure the supervision of work and supply all manpower, equipment, tools, materials, transportation and other services needed to carry out and complete all work described and specified in this section and contract documents including, but not limited to: excavation, stabilization, backfilling using approved granular materials and the compaction of excavations as indicated on plans and specifications.

.2 The excavation and backfilling work described in this section refers to the excavation and backfilling of the trench for underground utilities as well as for large-scale excavation and backfilling work.

.3 Excavations and backfilling include all necessary work to bring the infrastructure to the longitudinal and transverse profiles indicated on drawings or required by the Ministerial Representative.

.4 According to the nature of removed materials, the excavation is of 1st or 2nd class.

1.3 REFERENCES

.1 Bureau de normalisation du Québec (BNQ) (latest edition):

.1 NQ 2501-255 : Soil - Determining the moisture-unit weight ratio - Test with modified compaction energy (2 700 kN.m/m^3).

.2 Ministère des Transports du Québec:

.1 Cahier des charges et devis généraux du Québec - Infrastructures routières, Construction et réparation (latest edition) (Statement of Work and General Specifications – Road infrastructures, Construction and Repairs).

.2 Cahiers des Normes, Ouvrages routiers, Tome VII "Matériaux" (Standards, Roadwork, Vol. VII "Materials", latest edition.

.1 2101 Standard - Aggregates

.2 2102 Standard - Granular materials for the base, sub-base, paved surface and shoulder.

.3 2103 Standard - Granular materials for the cushion, surround, anti-contamination layer and filter layer.

.3 Cahier des Normes Tome III « Ouvrages d'art » (Standards Roadwork, Volume III, latest edition)

1.4 DEFINITIONS

.1 Additional excavation: any excavation work requested in writing by the Ministerial Representative in addition to that called for in the specifications.

.2 Backfill materials: material placed over the surround or protective layer up to the level of the infrastructure, the definitive ground level or the natural soil.

.3 Backfilling: operation, which consists in filling the trench and/or excavation using bedding, surround, fill material or borrow material.

.4 Bedding material: bed for the pipe's installation.

.5 Surround: material between the top of the bed and the underside of the fill or borrow material.

.6 Off-site borrow material: material from a source outside the worksite, which is required to fill excavations, build embankments, or other work when the excavated material is not reusable according to geotechnical specifications or are in short supply.

.7 Reusable excavation material: material identified by the Ministerial Representative and according to the geotechnical advises as suitable for specific fill applications. This material can be obtained from any excavation on the worksite.

.8 Classes of excavated material: two classes of excavated material are recognized, i.e., rock excavation (1st class excavation) and common excavation (2nd class excavation).

.9 1st class excavation: refer to article « 1st class excavation » of the section « Execution ».

.10 2nd class excavation: excavation of material of whatever nature other than that covered by the definition of excavation 1st class, including dense till, compact clay, frozen materials and partly cemented materials, which can be ripped and excavated using heavy equipment. Stripping, trench cleaning and reshaping are considered to be 2nd class excavation.

.11 Stripping: removal of organic material initially covering the ground, including land clearing materials.

.12 Topsoil: any material likely to favor the growth of vegetation and capable of being used as complementary soil for landscaping or seeding. Furthermore, if it is present on the site, this material must be excavated where specified on the work site. Finally, this material is unsuitable for use as fill.

.13 Digging of trenches: 1st or 2nd class excavation required for the construction of a trench for laying pipes and their accessories.

.14 Unshrinkable fill: controlled density mix consisting of cement and aggregates.

.15 Waste material: excavation materials unsuitable for reuse (trees, shrubs, bushes, branches, brush, stumps, dead wood and other vegetation waste and materials containing demolition debris) or surplus materials, which cannot be reused.

1.5 ELEMENTS TO BE SUBMITTED

.1 The Contractor shall refer to Section 01 33 00 - Submittal Procedures and Documents.

.2 Prior to the start of excavation work, the Contractor shall submit to the Ministerial Representative, for verification and approval details of dewatering and heave protection methods as required before undertaking the work.

.3 Before starting work, the Contractor shall perform a complete topographic survey of the roadway, shoulders, surrounding land to replace the culvert, etc. and that on the whole work area.

.4 Any non-compliant material shall be replaced by materials approved by the Ministerial Representative and the work shall be redone at the Contractor's expense.

.5 Provide the Ministerial Representative with a laboratory analysis confirming that the aggregates to be used as fill do not contain pyrite.

1.6 PROTECTION OF EXISTING UTILITIES

.1 Existing utilities and structures.

.1 Before undertaking any excavation work, the Contractor has both the responsibility and the obligation to contact Info-Excavation (1 800 663-9228) in order for the companies concerned to identify the location of underground utilities and services present on the worksite.

.2 Information relating to public utilities is based on available documents. It is provided to the Contractor for guidance purposes only and should not be considered to be complete or accurate.

.3 Should private or public structures or utilities be found, whether or not they appear on the plans or are indicated on the contract property, crossing or close to projected excavation work, above or below ground, it is the

Contractor's responsibility to obtain from the owners of these services and/or public utility organizations and companies all required information on the existence, nature, location, size, depth, etc. of these utilities or services.

.4 The Contractor must, himself, and at his expense, conclude agreements with the companies concerned with regards to the procedure and program of the work to be carried out. He must transmit this program to the Ministerial Representative at least forty-eight (48) hours before work is to start near the structures that must be protected.

.5 The Contractor must take all measures required to protect these structures against breakage and frost and/or provide the support needed to prevent collapse throughout the execution of the work which, even once it has been completed, must in no way affect the stability, quality and safety of existing structures. The Contractor alone is responsible for any and all damages incurred as a result of his work. All work to protect and support existing utilities or structures, including digging, is at the Contractor's expense.

.6 Digging must be carried out to determine the exact location, depth, and dimensions of the underground services encountered, whether or not they appear on the plans. Excavation in the ground, whether frozen or not, is done by hand on each side of the existing underground services, over a distance of 1,5 m (5.0 ft.) and below, to the underside of the services involved. No additional remuneration will be granted for this work. The use of explosives is prohibited in this instance.

.7 Obtain appropriate directives from the Ministerial Representative before moving or removing the utilities or structures identified in the excavation zone.

.8 Note the location of the underground utilities retained, moved or abandoned.

.9 In addition, the Contractor shall provide back into its original state, the land on which he performed the work, and on the total width of the right of way or easement owned by the company concerned.

1.7 CONDITION OF THE WORKSITE

.1 Take into account the location and special conditions of worksite.

.2 Take into account the level of the groundwater table and its impact on excavation conditions.

.3 In the event that contaminated materials are detected during construction, these excavated materials must be managed in compliance with prevailing environmental and municipal regulations. Moreover, excavated materials containing demolition debris must be managed as "dry materials".

.4 The Contractor must coordinate his work with that of all other contractors, companies or public utility firms carrying out work of any nature whatsoever during the time when work covered by this contract is in progress.

1.8 SHORING AND BRACING OF EXCAVATIONS AND STRUCTURES

.1 Shore and brace excavations to avoid slides, in compliance with construction safety codes, local regulations as well as the recommendations of the geotechnical advise.

.2 During excavation work, the Contractor must build the embankment(s) required and/or supply and install all steel sheeting, temporary support walls, cofferdams, bracing or other support required to successfully carrying out excavation work. The Contractor is fully responsible for the above-mentioned items.

.3 All excavations in the vicinity of existing structures must be limited, and adequate shoring and bracing of existing excavations and exposed structures must be provided.

.4 The Contractor is solely responsible for the choice of excavation methods used.

.5 The Contractor is fully responsible for any damage to existing installations and services or any bodily injury resulting from the absence or precariousness of the temporary structures and/or improper leveling of the embankment.

.6 The Contractor must provide a plan of these structures signed and sealed by an engineer who is a member of the Ordre des ingénieurs du Québec (OIQ - Quebec Order of Engineers).

1.9 PROTECTIVE MEASURES

.1 Protect the bottom of excavations against any softening and should this occur, remove the softened soil and replace it with compacted MG-20b type granular materials.

.2 Protect the bottom of excavations against frost.

.3 Excavation and backfilling work must be carried out in compliance with the construction safety code and recommendations of the geotechnical advice.

.4 Ensure the protection of vertical benchmarks, layout benchmarks, survey markers and geodesic monuments.

.5 Never stockpile excavated material where it could interfere with the work, drainage or the stability of excavation slopes.

.6 The Contractor is, at all times, responsible for protecting stockpiled materials, which he will store on the site or other location reserved for this purpose, In the case of debris and excavation surplus, he must determine their granulometric qualities and other physical characteristics, to determine whether they can be reused as priority fill materials. In the event of inadequate protection, the loading, transportation and disposal of this material at a site complying with the directives of the MDDEFP's Soil

Protection and Contaminated Sites Rehabilitation Policy will be at the Contractor's expense.

.7 At all times, the Contractor is required to take the necessary measures to keep dust generated by his work to a minimum.

.8 At the end of each work day, all excavations must be secured to the satisfaction of the Ministerial Representative.

1.10 INSPECTION AND TESTS

.1 The analysis and testing of materials and compaction are carried out by a specialized testing laboratory designated by the Parks Canada.

.2 Parks Canada assumes the cost of the inspection and laboratory analyses. If, because of non-compliance, these tests must be repeated, costs shall then be assumed by the Contractor.

.3 Granulometric analysis: fill materials are analyzed to determine their suitability for the projected use and their compliance with specifications.

.4 Density analysis: tests are conducted on compacted materials in compliance with the NQ 2501-255 standard : Soil - Determining the moisture-unit weight ratio - Test with modified compaction energy.

.5 Compaction tests:

.1 The Owner reserves the right to have compaction tests carried out to determine if the required compactness has been achieved. The Contractor must collaborate on the execution of these tests and can base no claim on work stoppage or other loss of time resulting from the execution of these tests.

.6 Testing frequency is defined by the Ministerial Representative.

.7 This same laboratory must provide the Ministerial Representative with progressive reports confirming that the required tests have been conducted as required by the plans and specifications. Moreover, the laboratory must provide the Ministerial Representative with a final report confirming that all fill complies with the plans and specifications, and no concrete or pavement can be placed until this report has been provided.

.8 Should the Contractor use a fill material other than the one sampled, all fill materials will have to be removed and replaced at his expense.

1.11 DENSITY OF COMPACTED MATERIAL

.1 When compacted, fill material must have moisture content as close to the optimum determined by the laboratory using the maximum dry density test in keeping with the NQ 2501-255 standard. Sprinkle water on overly dry soil, taking care to avoid saturation.

.2 The density of the compacted material is expressed as a percentage of the Modified Proctor maximum dry density.

1.12 GROUNDWATER TABLE

.1 Limit the depth of the excavation to avoid problems relating to the stability of the bottom.

.2 The Contractor is entirely responsible for the excavation measures required and adequate pumping to reduce the level of the groundwater table where required, as well as the control of the groundwater table while work is in progress, and all other additional work required by conditions encountered along the way.

.3 All costs related to measures covered by the previous article must be included in the bid and no request for additional funds or schedule delay will be considered, should the Contractor have failed to take these into account.

1.13 HIDEN ELEMENTS

.1 The Contractor covenants that it will hide any work such as pipes or otherwise, without first obtaining permission to backfill the Ministerial Representative.

1.14 1ST CLASS EXCAVATION BY DYNAMITING

.1 Excavation of first class blasting can only be achieved if the Contractor obtains written authorization from Parks Canada.

.2 Work concerning 1st class excavation by dynamiting consists in, but not limited to, supplying the materials and manpower required to carry out 1st class excavation by dynamiting work in keeping with good engineering practices, including:

.1 Drilling,
.2 Supply and installation of dynamite,
.3 Dynamiting of block of a dimension superior to 0.8 m^3,
.4 The loading, transportation and disposal of excavation surplus at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy,
.5 The location of public utility or service,
.6 The protection of existing structure,
.7 The dewatering of excavations,

.8 The compaction of fill, the shaping and compacting of the infrastructure.

1.15 1ST CLASS EXCAVATION BY MECHANICAL COMMUNITION

.1 Work concerning 1st class excavation by mechanical communition consists in, but not limited to, supplying the materials and manpower required to carry out 1st class excavation by mechanical communition work in keeping with good engineering practices, including:

.1 The necessary machinery and manpower to break the rock mechanically using equipment of the type "Tramac" or "ripper",

.2 The loading, transportation and disposal of excavation surplus at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy,

.3 The location of public utility or service,

.4 The protection of existing structures,

.5 The dewatering of excavations,

.6 The compaction of fill, the shaping and compacting of the infrastructure.

1.16 2ND CLASS EXCAVATION

.1 Work involving 2nd class excavation consists in, but is not limited to: supplying the materials and manpower required to carry out 2nd class excavation work in keeping with good engineering practices, including:

.1 The loading, transportation and disposal of excavation surplus at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy,

.2 The location of any other public utility or service,

.3 The protection of existing structures,

.4 The dewatering of excavations,

.5 The compaction of fill, the shaping and compacting of the infrastructure.

1.17 BORROW MATERIALS

.1 Work relating to borrow materials consists in, but is not limited to supplying the materials and manpower required to carry out the supply and application of borrow materials, according to good engineering practices, including:

.1 The dewatering of excavations,

.2 The supply, placement and compaction of borrow materials,

.3 The shaping and compacting of the infrastructure.

1.18 CLASS A GRANULAR MATERIALS

.1 Work relating to Class A granular materials consists in, but is not limited to supplying the materials and manpower required to carry out the supply and application of Class A granular materials, according to good engineering practices, including:

.1 The dewatering of excavations,

.2 The supply, placement and compaction of Class A granular materials replacing excavated materials.

1.19 LOCATION OF EXISTING SERVICES

.1 Work relating to the location of existing services consists in, but is not limited to, supplying the materials and manpower required to locate existing services, according to good engineering practices, including:

.1 The dewatering of excavations,

.2 The supply, placement and compaction of Class A granular materials replacing excavated materials,

.3 The loading, transportation and disposal of excavation surplus at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy,

.4 The compaction of fill, the shaping and compacting of the infrastructure,

.5 The protection and repair of public utilities and services.

1.20 EXCAVATION SURPLUS

.1 If the Contractor remove an excavation volume greater then the one determine by the theoretical section, no additional remuneration is allowed.

1.21 ROCK MEASURING

.1 The rock is paid according to volume in place before dynamiting or mechanical fragmentation. The level of the rock in place before dynamiting or mechanical fragmentation is established on site by the Ministerial Representative in the presence of the Contractor. The Contractor must warn the Parks Canada Representative each time he meets rock or another material payable with the item "dynamiting of 1st class material". If the Contractor neglects informing the Ministerial Representative, the Contractor cannot claim any reclamation for dynamiting 1st class material excavated without the Ministerial Representative or its representative on worksite

Part 2 Products

2.1 RECYCLED MATERIALS

.1 The recycled materials must meet the standard « Granulats - Matériaux recyclés fabriqués à partir de résidus de béton, d'enrobés bitumineux et de briques - Classification et caractéristiques » NQ 2560-600. The information concerning the

use of recycled materials is given in different appendices of this standard according to classification and characteristics of these materials.

.2 The use of recycled materials may be used only with the approval of the Ministerial Representative is governed by all the other technical requirements appearing within the present estimate as for compactness, thickness of layers, etc.

2.2 GRANULAR MATERIALS

.1 As granular materials, use only natural non-plastic soil such as sand or graded crushed stone as stipulated in the specifications. These materials must comply with the Quebec Department of Transport's 2101 and 2102 standards relating to the granulometry and physical and mechanical properties of the aggregates. Materials must first be approved by the laboratory and the Ministerial Representative.

.2 The diameter of the crushed stone must not exceed one third of the thickness of the base layer or larger than 112 mm.

.3 The granular materials must satisfy the requirements of standard MTQ 2102:

.4 Class MG-112 granular materials or sand can also be used as excavation fill and backfill.

.5 The grading envelopes of granular materials must meet the requirements of the following "Grading Envelope of Granular Materials" table while the physical and mechanical properties of the granular materials must meet the requirements of the following "Physical Properties of Aggregates for the Roadway Infrastructure and Base Course" table:

.6 Conformity: All granular materials not respecting the requirements enumerated previously are refused and must be replaced by materials in conformity with the following requirements.

Grading Envelope of Granular Materials

Granular materials	Sieve (mm)									Sieve (µm)			
	112	80	56	31,5	20	14	10	5	1,25	630	315	160	80
	(% passing)												
MG-20	-	-	-	100	90-100	68-93	-	35-60	19-38	-	9-17	-	2-7
MG-20b	-	-	-	100	90-100	68-93	-	35-60	19-38	-	9-17	-	5-11
MG-56	-	100	82-100	55-85	-	-	-	25-50	11-30	-	4-18	-	2-7
MG-112	100	-	-	-	-	-	-	12-100	-	-	-	-	0-10
MG-112 modified	100	-	-	-	-	-	-	20-75	-	-	-	-	0-10
Installation bed	-	-	-	-	-	-	100	95-100	50-85	25-60	10-30	-	0-10
Stabilized sand	-	-	-	-	-	-	100	95-100	50-90	25-65	10-35	4-25	-

** To be respected before and after compaction.*

Physical Properties of Aggregates for the Infrastructure and Base Course

Designations	Physical properties					
	Organic Matter max. (%)	Micro-Deval (MD) (%)	Fragmentation min.	Los Angeles (LA) (%)	MAX. (%)	Blue Value
	Standards					
	LC 31-228	NQ 2560-070	LC 21-100	BNQ 2560-400	MD + LA	BNQ 2560-255
MG-20	0,8	35	50	50	80	0,20
MG-20b	0,8	35	50	50	85	0,20
MG-56	0,8	35	50	50	80	0,20
MG-112	0,8	40	-	50	85	0,20

2.3 BACKFILL MATERIALS

.1 Backfill materials must be approved by the Ministerial Representative prior to their use. They are from site or borrow excavations (Class B) for use beneath the roadway infrastructure line.

.2 All compactable materials and comply with the 1101 standard MTQ can be used if they meet the requirements of Article 11.6.1 of the CCDG MTQ except organic soils, contaminated soil and frozen soil. Soil components must be mineral in nature. The use of these materials depends on their condition, the height of the embankments to be built and weather conditions. If required by the plans and specifications, the condition of the materials must be improved using an appropriate treatment. A reference board or particle size analysis should be performed on the excavated materials stack, and, as mentioned in the geotechnical advice.

.3 Materials must be free of foreign bodies such as brick fragments, roots, trees, lawn, ash, fly ash, frozen soil, contaminated soil, snow, ice, etc.

2.4 "CLASS A" GRANULAR MATERIALS

.1 "Class A" granular materials are natural non-plastic soil such as sand, gravel or stone. The diameter of the stones must not exceed one third of the thickness of the fill layers or 112 mm at their largest.

.2 These materials are frost-proof and can be used for sub-bases, submerged backfill, and the backfilling of excavations.

.3 "Class A" granular materials must have the following granulometry as well as meet the following physical and mechanical requirements:

Grading Envelope of "Class A" Granular Materials

Granular materials	Sieve (mm)									Sieve(µm)			
	112	80	56	31,5	20	14	10	5	1,25	630	315	160	80
	(% passant)												
Gravel and sand (MG-112)	100	-	-	-	-	-	-	12	-	-	-	-	0-10
Stone dust, manufactured sand	-	-	-	-	-	-	100	75-100	-	-	-	4-25	0-10

.4 The Ministerial Representative can accept a percentage of 0-15 passing through a sieve with openings of 80 µm if the material is located beneath the frost line, a depth of 1.8 m.

Physical Properties of Aggregates for "Class A" Granular Materials

Physical Property						
Organic matter max. (%)	Micro-Deval (MD) (%)	MgSO4 Durability (%)	Fragmentation min	Los Angeles (LA) (%)	MAX. (%)	Blue Value
Standards						
LC 31-228	NQ 2560-070	BNQ 2560-450	LC 21-100	BNQ 2560-400	MD + LA	BNQ 2560-255
0,8	40	35	-	50	85	≤0.2

Part 3 Execution

3.1 SITE PREPARATION

.1 Within set limits and approved by the Ministerial Representative, cut trees, grub and strip site, remove obstacles, ice and snow from the surface of the excavation zone. Reserve canopy and provide transportation to site and removal.

.2 Materials removed must be disposed of off-site, in keeping with the article "Disposal of waste materials" in this section.

.3 Roads and access ramps must be built on the worksite, as needed, and maintained by the Contractor throughout the duration of excavation work.

3.2 EXCAVATION EQUIPMENT

.1 Excavation equipment must be suited to the projected work and sized to carry it out effectively.

3.3 THEORETICAL EXCAVATION AND FILL LINES

.1 A theoretical typical section of a trench excavation shall comply with both BNQ and CSST standards.

.2 It is understood that the Contractor shall, at all times, comply with the "Code de sécurité pour les travaux de construction" (Safety Code for Construction Work) in effect in the province of Québec.

3.4 1ST CLASS EXCAVATION

.1 Generalities

.1 The 1st class excavation includes the removal of the rock and the concrete works or strongly cemented masonry, as well as stones of a dimension equal or higher than 0,8 m³. The 1st class excavation also includes the removal of massive or schistous rock formations, whose extraction can be adequately made only after being beforehand broken using a ripper.

.2 The stone beds in clay, the disaggregated schist, the resistant ground "hard pan" and the cold ground do not constitute 1st class excavation, even if their extraction cannot be done adequately using a general purpose excavator.

.3 Rock cutting must be confined within the theoretical limits indicated by the Ministerial Representative. The slope inclinations must be of 5 V : 2 H (5,0 m vertically over 2,0 m horizontally). Any rock point salient on the cut walls must be striked off and the rock fragments, broken or cracked, must be removed.

.4 At the bottom of the cut of rock, any point salient of more than 80 mm above the required level must be striked off. Depressions under the infrastructure line must be filled by MG-20b stone or MG-112 up to the required level. This backfilling must be made at the expenses of the Contractor.

.5 The measuring of 1st class excavation is carried out by the Ministerial Representative in the presence of the Contractor's representative. The Contractor must warn the Ministerial Representative each time he meets rock or another 1st class excavation material. If the Contractor neglects informing the Ministerial Representative, the Contractor cannot claim any reclamation for 1st class material excavated without the Ministerial Representative.

.6 The Contractor cannot claim any compensation for the composition, the hardness or the type of rock formation encountered; making its extraction more expensive than envisaged.

.2 Disposal of 1st class excavated material

.1 The Contractor must dispose 1st class excavated materials in conformity with the requirements of article "Excavation surplus disposal".

.3 1st class dynamited material

.1 The 1st class dynamited material is applicable to volumes of solid rock and the strongly cemented works out of concrete or masonry requiring the use of explosives, just as with the volume of stones of a dimension equal or higher than 0,8 m³. The 1st class dynamited material is also applicable to the volume of massive or schistous rock formations whose extraction can be adequately made only after being beforehand broken, by the use of explosives. The rock must be dynamited fine enough fine to be able to be re-used for backfilling.

3.5 2ND CLASS EXCAVATION

.1 2nd class excavation includes all excavations, which are described as 1st class excavation in the preceding article. Excavation materials coming from trench cleaning and reshaping are part of 2nd class excavation quantities.

.2 Notify the Ministerial Representative at least one week prior to the start of excavation work and, in his presence, note the land's natural profile where required.

.3 Dig trenches along the theoretical lines, cross-sections, layouts, levels and dimensions indicated.

.4 Completely excavate all topsoil and organic material. This material may not be used as fill, but must be piled and reused for revegetation in some areas. Debris from building materials such as bricks, concrete, wood, old paving, sidewalks, curbs, or roundhead central mall, riprap, walls, stone fences etc.., may be encountered during excavation. The materials must be managed as "dry materials". Refer to the section "Layout scrap materials" in this section.

.5 The bottom of the excavations must be level, consist of dry, undisturbed soil, and free or organic or loose matter. Reworked soil must be removed by hand.

.6 Fill unneeded excavations at no additional cost, as follows: The excavation shall be filled using excavation materials deemed to be reusable, free of stones measuring more than 150 mm (6 in.) in diameter, frozen material or organic matter. Voids will be filled using a finer material. The Contractor shall compact materials to 90 % of the Modified Proctor in successive layers with a maximum thickness of 200 mm (8 in.), until the level required to restore and/or shape the infrastructure of existing or projected elements. If excavation surplus is deemed to be non-reusable, the Contractor shall use borrow materials approved by the Ministerial Representative. Compacted fill shall be installed along the entire width of the excavation.

.7 Once the excavations have been completed, ask the Ministerial Representative to inspect their depth and dimensions. No filling can be carried out without the authorization of the Ministerial Representative.

.8 Any excavation shall be backfilled every shift to allow vehicular traffic.

.9 In order to minimize impact vehicular traffic on granular surface, the Contractor will do the asphalt layer base each 1000 m of realised excavation.

.10 Tag excavated sections having a level difference less than 50 mm will be tagged with TRV-7, on asphalt surface not excavated.

.11 Take all precautions needed to prevent damage to existing services.

.12 If excavation and backfilling work is to be carried out in winter, the bottom of excavations must be protected against frost.

3.6 DEWATERING OF EXCAVATIONS

.1 The Contractor must plan for all pumping work required keeping excavations dry. A pumping system must be installed when required and its capacity must be sufficient to drain surface water or water from infiltrations or leaks from the sewer pipes, water mains or other artificial elements. Precautions must be taken when the soil is silty or sandy, to avoid taking in fine particles. If need be, the Contractor must dig channels away from the foundations to carry water towards the manholes or ditches, so as to properly drain the soil prior to backfilling. To this end, the Contractor must refer to the geotechnical study.

.2 Submit, to the Ministerial Representative, for verification, details of dewatering and heave protection methods, such as the installation of dikes, well points and sheet-pile cut-offs.

.3 Before the start of pumping work, the Contractor must confirm the condition and capacity of ditches and storm or combined sewers into which the water is pumped. He is responsible for flooding and all property damage caused by the pumping of this water. The clean-up of accumulations of soil or other debris resulting from the pumping into existing pipes shall be at the Contractor's expense.

.4 Install and operate the dewatering system so as to avoid lowering the level of the groundwater table outside the excavation to a point that could damage or threaten adjacent structures.

.5 The Contractor shall, at his expense, put up, install and operate all equipment needed to keep excavations dry during construction.

.6 In the event of an emergency (including breakdowns) an adequate pumping system in good working order must be available at all times. Moreover, workers capable of operating this system must also be available at all times.

.7 If there is a risk of soil liquefaction or heaving, avoid excavating beneath the groundwater table. To avoid pipeline upheaval or excavation bottom heave, lower the level of the groundwater table or use other appropriate means.

.8 Protect open-cut excavations against flooding and other damages, which could result from runoff.

.9 All surface or groundwater, whether they are from natural sources, precipitation, melting snow, ice, infiltration, leaks or outflow from sewer pipes or other artificial element, must be drained, at the Contractor's expense. The Contractor is entirely responsible for water control, which must comply with prevailing municipal and provincial environmental regulations.

3.7 UNSTABLE SUB-BASE

.1 Every time materials constituting the floor of an excavation, which has been brought to the level indicated on the drawings or the Ministerial Representative, are found to be too soft or, for whatever other reason, inadequate for supporting a pipe or other element to be built, the Contractor must excavate to a greater depth and build a special base, as required by the Ministerial Representative.

.2 If the Ministerial Representative considers that the condition of the soil, which is soft or unsuitable for whatever reason, is due to unavoidable conditions, special base work can then be carried out by the Contractor, as instructed by the Ministerial Representative.

.3 In the event that the Ministerial Representative considers that the condition of materials, which are soft or unsuitable for whatever reason, results from the Contractor's failure to adequately protect, handle and drain the worksite, or other negligence on the part of the Contractor, the latter shall, at his expense, excavate to the additional depth required of him, and fill the excavation in a satisfactory manner to the required level, even if unshrinkable fill or crushed stone is to be used, or if on the orders of the Ministerial Representative, other means are to be used to properly support the structure.

3.8 MAINTENANCE OF THE FILL SURFACE

.1 The Contractor is required to keep the fill surface of trenches in good condition until the work has been accepted. Moreover, he is responsible, at all times, for accidents and damage caused to individuals, public or private property as well as vehicles. He is required to correct any sagging that might develop in the pavement and carry out all other work needed for the structure to be put into service or which might be required by the Ministerial Representative.

.2 In an emergency, or if the Contractor has failed to carry out repairs deemed necessary and requested via a 48 hour written notice from the Ministerial Representative, the latter can have said work carried out by a third party, at the Contractor's expense.

3.9 LEVELS AND ALIGNMENTS

.1 The Contractor must use a laser in every pipe and ensure the ventilation required to counter radius bend.

.2 The Contractor shall coordinate his work to allow the Ministerial Representative to carry out his verifications.

3.10 COMPACTION

.1 Generalities

.1 The compaction of materials seeks to increase their load-bearing capacity and prevent future settlement. Compacting operations shall be carried out at an ambient temperature above 0 °C in the case of cohesive soil, and it must be above - 6 °C in the case of granular soil, with the latter compacted before materials have reached a temperature below 0 °C.

.2 If the required compaction density is not achieved, the Contractor shall remove the excavation fill and restart compaction work using heavier equipment or increasing the number of passes. Repeat until the required compaction density has been reached.

.2 Compaction equipment

.1 Compaction equipment must make it possible to achieve the stipulated material densities. Replace or reinforce equipment if such is not the case.

.2 All types of standard compaction equipment, in good working order, can be used to densify various soils as stipulated. It may be necessary to add mechanical rammers, scarifiers, harrows, rotary mixers, sprinklers, etc. depending on the work to be carried out.

.3 The Contractor must provide the Ministerial Representative with the characteristics of the compaction equipment he plans to use.

.4 However, the Ministerial Representative reserves the right to refuse any compaction equipment that is inadequate or unsuited to local conditions, the nature of the soil and materials used.

.3 Compaction control

.1 Compaction control is ensured by the laboratory retained by the Owner. The Contractor must notify the Ministerial Representative twenty-four (24) hours in advance to have the required tests carried out.

.4 Compaction levels

.1 This article deals with the level of compaction required for the natural soil and embankments. Embankments must be erected in successive layers, compacted separately and evenly.

.1 Compaction of the natural soil:

.1 The bottom cut and natural soil stripped of topsoil must be densified to a depth of 150 mm, to 90 % of Modified Proctor maximum dry density. If the bottom cut or the natural soil coincides with the infrastructure line, the first 150 mm beneath the infrastructure line must be densified to 95 % of Modified Proctor.

.2 Compaction of soil fills:

.1 Fill materials are densified to 90 % of Modified Proctor maximum dry density, except for the last 150 mm beneath the infrastructure line, which are densified to 95 % of Modified Proctor.

.3 Compaction of stone fills:

.1 Each layer beneath the infrastructure line must be compacted using four passes of a crawler tractor weighing a minimum of 30 tons. Over the top 300 mm layer, two additional passes using a vibratory roller with a minimum static weight of 5 tons and a centrifugal force of more than 10 tons are required. In the case of friable or foliated rock, each layer must be compacted in keeping with the compaction requirement of the last 300 mm layer.

.2 The fill must have a minimum density of 90 % of Modified Proctor maximum dry density, except for the last 150 mm below the infrastructure line, which shall be densified to 95 %.

.5 Optimal water content

.1 Add or dewater as needed to maintain the materials' required water content and thus achieve the stipulated compaction.

.2 The Contractor must strive to obtain, on the worksite, a water content allowing him to achieve the required density.

.3 The Contractor shall supply the equipment needed to accelerate the drying of overly moist soil or moisten overly dry soil.

.4 If the soil is too moist to allow even compaction to the required density, the Ministerial Representative may require that the soil be mixed with dry soil or dried by aeration or scarification.

.5 If, on the other hand, the water content is inadequate, the Ministerial Representative can require watering to obtain a suitable content. The equipment required for this work is a 4 500 litre mobile tank fitted with a pressure or gravity release mechanism. The operator must be able to adjust the water distribution rate to ensure even distribution throughout the layer to be densified prior to compacting. If the surface is smooth, the Contractor shall use a scarifier or harrow to favor water penetration.

.6 Density loss and reworking of the soil

.1 In the event that, before the end of the contract, the natural soil or a layer of materials already compacted according to specifications, should lose density

due to the movement of equipment, poor weather, freeze-thaw cycle or any other reason, the Contractor shall be required to re-compact the soil to the required density, at his expense.

.7 New targeted density

.1 When the compaction level does not meet criteria for acceptance and the Ministerial Representative is certain that this is not due to inappropriate operations by the Contractor or to his equipment, the Contractor can request that a new targeted density be established based on field tests:

.1 Establish a single field test on a uniform layer covering a surface area established on the worksite by the Ministerial Representative. The water content of materials tested must be close to the optimal water content (as measured using the NQ 2501-255 test method).

.2 Following the placement of the materials, run the compaction equipment over the full test surface six times. Determine densities and water content at three randomly selected sites. Calculate the dry density of each of the sites and use the average as the initial density value.

.3 Run the compaction equipment over the entire field test area two more times. Determine the densities and water content at three other randomly selected sites. Calculate a new average dry density.

.4 If the new average dry density does not exceed the initial value by more than 1 %, the compaction field test shall then considered to be satisfactory and complete. If the new average dry density exceeds the initial value by more than 1 %, additional runs of compaction equipment over the field test area will be conducted, in keeping with the above-mentioned procedure, until acceptance criteria have been met.

.5 Once compaction field tests have been completed, determine the densities and water contents at seven other randomly selected sites, then calculate the dry density at each of these sites. Calculate the average field test density based on the average of these seven values and the three final values determined by the field tests.

.6 The average dry density of the field tests becomes the new targeted density.

.7 The targeted density established based on field tests should be representative of the remainder of the layer, provided that the source and type of materials as well as the compaction equipment remain the same.

3.11 DISPOSAL OF WASTE MATERIALS

.1 Generalities

.1 The Contractor shall load, transport and dispose of all waste material outside limits of Forillon National Park, at the location, which he shall select and

which is suited to the disposal of said waste, in compliance with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.2 Loading, transportation and disposal of waste are at the Contractor's expense.

.2 Dry materials

.1 All materials from 2nd class excavation such as crushed or shredded residue, which are non-fermentable and contain no hazardous waste such as scrap wood, rubble, waste plaster, and concrete, masonry and paving refuse, shall be transported and disposed of at a dry materials dump authorized by Quebec's Environment Minister. The Contractor must provide the Ministerial Representative with proof that the selected dumpsite meets the requirements of this article as well as receipts issued by the dumpsite upon reception of the material. The cost of sorting, handling and disposing of these materials shall be assume/ by the Contractor.

.2 Materials from the deforestation and clearing of the zone affected by the work (such as trees, shrubs, bushes, branches, brush, stumps, dead wood, and other vegetation waste and materials containing demolition debris) or from the demolition of existing pavement, curbs, and sidewalks or existing underground installations, shall be disposed of at a site authorized for dry materials. The cost of sorting, handling and disposing of these materials shall be assumed by the Contractor.

.3 Unusable materials

.1 All materials from 2nd class excavation and deemed unusable by the Ministerial Representative, such as putrid matter, topsoil, loam, etc., shall be transported to a suitable location chosen by the Contractor and approved by the Ministerial Representative. Rotting materials from debris will also be loaded into closed truck boxes. The cost of sorting, handling and disposing of these materials shall be assumed by the Contractor.

.2 If deemed necessary by the Ministerial Representative, the Contractor shall, for filling trenches, replace unusable materials with acceptable materials.

3.12 DISPOSAL OF EXCAVATION SURPLUS

.1 Unused excavation surplus materials for section 1 contract, satisfying the requirements of backfill and approved by the Ministerial Representative, shall be piled in priority within the new limit section 2, as shown in the sketch in appendix of the specifications.

.2 At first, the excavation surplus must be laid on the entire area indicated on section 2 with a thickness of 900mm and a width of 20m. Then, the Contractor must wait two (2) weeks before performing a 300mm second layer thickness of excavated material to allow properly consolidation soil. Finally, if excavated material must still be set aside, the Contractor shall dispose 300mm thickness layer and wait one (1) week between each additional layer. The Contractor must perform the implementation in

order to have a 3% crossfall and slopes respecting the 1V: 2.5H. The Contractor shall carry and extend surplus at its own expense in accordance with the location and the levels provided by the Ministerial Representative.

.3 The Contractor must implement elements to measure soil consolidation of section 2 as specified in the geotechnical report of this section. The Contractor shall install the various measurement tools as shown below, and as required by the ministerial Representative. The Contractor shall install:

.1 Compaction plates including piezometers: Installation every 100 meters, 5 meters offset the center line.

.2 Layer indicator: Installation every 20 meters, 6 meters offset the center line.

.3 Lateral moving indicator: Installation every 100 meters, 6 meters offset the center line.

.4

.4 Excavation surplus refused by the Ministerial Representative for the project's backfilling purposes can be disposed of at a site selected by the Contractor outside the limits of Forillon National Park, with the applicable local authorities. Once disposal has been completed, the materials must be leveled to the satisfaction of the owner(s) of the land. The Contractor must obtain a letter of authorization from each of the owners of the land covered by these provisions. A copy of this agreement and a Gaspé Town's authorization must be provided to the Ministerial Representative before material is transported.

.5 All work covered by the preceding provisions shall be carried out in compliance with the directives and/or regulations of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy, which, in the event of contradiction, take priority over the preceding requirements.

.6 All expenses related to any use whatsoever of the above-mentioned disposal and/or landfill site, including the obtaining of any permit and/or authorization, as well as the loading, transportation and disposal, shall be at the Contractor's expense.

.7 All sites for the storage (excavation surplus excluding any refuse) considered within the framework of this contract must first be approved by the Ministerial Representative no later than the first worksite meeting. None of these materials can be disposed of until this approval has been obtained.

.8 Part of the debris is used by the Contractor to carry out work covered by this contract. If excavation surplus is required by the Owner, the Contractor shall transport and spread this surplus material at his expenses, at designated locations within an overland radius of 8.0 km, as established by the Owner.

.9 All excavation surplus and 1st and 2nd class debris not required by the Owner become the property of the Contractor.

.10 The Contractor shall ensure that these materials are not disposed of in a flood zone and, prior to the start of the work, shall provide the Owner with a permit.

.11 The Contractor is solely responsible for consequences resulting from the filling of one or more properties and possible claims or lawsuits from the property owners concerned, with regards to the levelling, the quality of debris materials, damages to trees, terraces, etc. The disposal of excavation surplus must not impede the natural drainage of the site.

3.13 ACCESS ROADS

.1 Put in and maintain suitable roads providing access to the worksite.

.2 The Contractor shall restore land used as an access road to its original condition.

3.14 RESTORATION WORK

.1 Once work on the project has been completed, remove surplus materials and debris, trim slopes and correct defects identified by the Ministerial Representative.

.2 Clean and restore areas damaged by the work, as directed by the Ministerial Representative.

.3 Unless otherwise indicated, the ratio of embankment slopes will not be less than 1 V : 1.5 H.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 31 00 00 – Generalities (Civil)

.2 Section 31 23 11 – Excavation and Backfilling

1.2 SCOPE OF WORK

.1 The work shall include, but not be limited to, supplying the materials and manpower required for the execution, according to good engineering practices, of the environmental management and disposal of excavation surplus, in compliance with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy and prevailing municipal by-laws. Also included:

- .1 Lifting of samples by a recognized environmental firm,
- .2 Chemical analysis of these samples by a laboratory accredited by the MDDEFP,
- .3 The borehole rate is 1/625 m^2,
- .4 The sample rate is 1 per horizon encountered in the boreholes,
- .5 Parameters to be analyzed will be: PAH, PH C10-C50, metals (13 elements),
- .6 The excavation, loading, transportation and disposal of excavation surplus to a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy,
- .7 The manual segregation and temporary storage of waste contained in excavated materials,
- .8 If required, the installation of temporary piles, including the polythene fabrics of 6 mils covering the piles,
- .9 The disposal of excavated contaminated soil on authorized sites or their transportation for reuse as directed by the Ministerial Representative,
- .10 Supply of the weighing of each enumerated range and the weighing machine calibration certificate,
- .11 The surveying of work zones, excavation boundaries and bottoms, and restored zones,
- .12 Cleaning of each truck's box,
- .13 Providing the permits and documents attesting the site's compliance to MDDEFP,
- .14 All other work required for the complete production of these structures.

Part 2 Products

2.1 MANAGEMENT OF CONTAMINATED SOIL

.1 The environmental management of excavation surplus includes the lifting of soil samples by a recognized environmental firm and the chemical analysis of these samples by a laboratory accredited by the MDDEFP.

.2 Parcels of land to be decontaminated and estimated volumes of the different materials to be excavated were established during the environmental site assessment and are presented in the report on the geotechnical study carried which is attached to the contact documents.

.3 The Contractor shall lift one sample per 625 m^2. He must lift and analyze one sample per horizon encountered in the borehole[s). The location of the boreholes shall be determined by the Ministerial Representative on the work site.

.4 For each sample, the Contractor shall have an analysis conducted for the following parameters:

- .1 Petroleum hydrocarbons (C10-C50),
- .2 Polycyclic aromatic hydrocarbons (PAH),
- .3 Metals (13 elements).

.5 Results obtained shall be compared with the generic contamination criteria of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.6 Excavation materials below criteria A and excavation materials within the A-B range can be reused as excavation fill, providing they comply with the previously listed criteria.

.7 Excavation materials within the A-B that could not be re-used as backfilling materials in this project must be disposed of at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.8 Excavation materials within the B-C range must be disposed of at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.9 Excavation materials above the criteria C must be disposed of at a site complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.10 The Contactor shall carry out sampling and analyses at least one week prior to any excavation work, since no excavation work can be authorized until results have been transmitted to the Ministerial Representative.

Part 3 Execution

3.1 DISPOSAL OF CONTAMINATED EXCAVATION MATERIALS

.1 The Contractor must refer to la section 31 23 11 - Civil - Excavation and Backfilling.

3.2 ABBREVIATIONS AND DEFINITIONS

.1 Generalities

.1 Should contaminated materials be detected during construction, these excavated materials shall be managed and disposed of in compliance with prevailing environmental and municipal regulations.

.2 Abbreviations and definitions

.1 Waste: Refers to any material to be excavated by the Contractor, which corresponds to definitions contained in the Regulation respecting solid waste or the Regulation respecting hazardous materials, administered by Quebec's MDDEFP (Ministry of Sustainable Development, Environment, Fauna and Parks).

.2 Soil to be excavated: Refers to any soil that must be excavated by the Contractor at locations and depths determined by the Owner.

.3 A-B Soil: Refers to soil whose contamination concentrations fall within the A-B range as defined by the generic criteria of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.4 B-C Soil: Refers to soil whose contamination concentrations fall within the B-C range as defined by the generic criteria of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.5 >C and < Soil : Refer to soil whose contamination concentrations exceed generic C criteria as defined by the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy and falls below the standards of the Regulation respecting the burial of contaminated soils.

.6 Soil whose chemical and geotechnical characteristics are acceptable: Refers to soil from restoration work, which has been temporarily stored on the site itself or on an outside site, whose components are mineral in nature and whose contamination concentrations do not exceed permissible levels shown in the Table for the Management of Contaminated Excavated Soils included in the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy, in compliance with this section's "Backfilling Materials" article.

3.3 TEMPORARY STORAGE

.1 It is important to note that the work site shall be used for the temporary storage of piles of excavated soil. Debris must never be piled more than 1 meter in height, to ensure the establishment's visibility and security, except occasionally within a single work day.

3.4 LEGISLATION

.1 The Contractor must carry out all soil and groundwater restoration work in compliance with the following guides, guidelines, standards and regulations:

.1 MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

.2 MDDEFP's guides and guidelines.

3.5 EXCAVATION OF CONTAMINATED SOIL

.1 Should contaminated soil be encountered, the Contactor shall conduct excavation work in a methodical fashion, which provides the control required for environmental follow-up. He shall carry out selective excavations, as directed by the Ministerial Representative.

.2 The Contractor must consider that the Ministerial Representative must be present throughout the duration of excavation work and that the latter can, at any time, stop work in a sector to carry out observations, samplings and analyses. The Contractor shall provide all collaboration required for the smooth execution of the work, to ensure that all contaminated soil is removed and disposed of in an adequate manner. In this regard, it is possible for changes to occur and for the elevations of contaminated soil to be excavated be modified as excavation work progresses.

3.6 MANAGEMENT OF EXCAVATED MATERIALS

.1 When required, excavated soil shall be temporarily stored on polyethylene tarps. Soil shall also be covered with a polyethylene tarp. Tarps must be of "Extra Strong" calibre, 6 mils thick and well anchored.

.2 Debris must never be piled more than 1 m in height, to ensure the establishment's visibility and security, except occasionally within a single work day.

3.7 SAFETY

.1 The Contractor must, at his own expense, prevent excavations from collapsing. To this end, he must maintain stable slopes required for the proper execution of the work and the protection of workers on the jobsite.

.2 The Contractor shall take measures needed to ensure that the piles of materials as well as the work do not impeded traffic and transportation. He must use a work method that allows him to confine contaminated soil to specific areas, in order to limit the risk of contaminating clean zones.

3.8 DISPOSAL OR TREATMENT OF CONTAMINATED SOIL

.1 Contaminated soil, which cannot be reused as fill material on the site, shall be shipped for disposal or treatment to an authorized site. Weight tickets given to the driver by the treatment or disposal site shall be handed to the Ministerial Representative.

.2 Truck boxes shall be fitted with removable hoops and watertight tarps firmly secured to the walls.

END OF SECTION

PART 1 - GENERALITIES

1.1 RELATED SECTIONS

Section 31 00 00 – Generalities (Civil)

Section 31 23 11 – Excavation and Backfilling

Section 33 31 00 – Culverts

Section 32 91 21 – Topsoil and Finish Earthwork

1.2 EXTENT OF WORK

.1 Supervise work and provide all labour, equipment, tools, materials, transportation and other services required to execute and complete all work described and specified in the present section and in the contract documents, including but not limited to: providing, laying and compacting aggregates necessary for the construction of one or more aggregate base courses and the supply and laying of one or more layers of asphalt concrete mixed in a central plant and laid over an aggregate surface, in all cases in compliance with the lines, thicknesses, levels and profiles indicated on the contract drawings or as specified by the Ministerial Representative.

1.3 REFERENCES

.1 Bureau de normalisation du Québec (B.N.Q. – Quebec standards office).

.1 CAN/BNQ 2501-255/2013 : Sols - Détermination de la relation teneur en eau-masse volumique - Essai avec énergie de compactage modifiée (2700 kN.m/m^3). [Soils – Determination of wet density – test with modified compacting energy]

.2 Ministère des Transports du Québec (Quebec transportation department, hereafter MTQ)

.1 Cahier des charges et devis généraux du ministère des Transports du Québec, latest edition.

.1 Section 13 - Revêtement de chaussée en enrobé. (Pavement with asphalt mixes)

.2 Cahier des normes, Ouvrages routiers, vol. I "Conception routière", latest edition. (Road construction standards – design)

.3 Cahier des normes, Ouvrages routiers, vol. II "Construction routière", latest edition. (Road construction standards – construction]

.4 Cahiers des normes, Ouvrages routiers, Tome VII « Matériaux », latest edition.

.1 Standard 2101 - Granulats. (Aggregates)

.2 Standard 2102 - Matériaux granulaires pour fondation, sous-fondation, couche de roulement granulaire et accotement. (Aggregates for base course, subbase, aggregate surface course and shoulder)
.3 Standard 4101 - Bitumes. (Asphalts)
.4 Standard 4105 - Émulsions de bitume. (Bituminous emulsions)
.5 Standard 4201 - Enrobés à chaud formulés selon le principe de la méthode Marshall. (Hot mix asphalts mixed using Marshall method principles)
.6 Standard 10201 - Peinture à alkyde pour le marquage des routes. (Alkyd paint for road markings)
.7 Standard 13101 - Géotextiles. (Geotextiles)
.8 Standard 14601 - Microbilles de verre pour peinture servant au marquage des routes. (Glass micro-beads for road-marking paint)

.5 Cahiers des normes, Ouvrages routiers, Tome VIII « Dispositifs de retenue », latest edition.

1.4 WORK PERFORMED BY OTHER COMPANIES OR CONTRACTORS

.1 Where applicable, the Contractor must coordinate its work with that of any other Contractor, company or public utility that needs to perform work of any nature whatsoever, before or during the period of work covered by the present contract.

1.5 INSPECTION AND TESTING

.1 Analyses and tests of materials and compacting work are to be done by a testing Laboratory designated by the Owner.

.2 The Owner shall pay said Laboratory's inspection and testing fees. If any tests must be repeated due to the discovery of non-conformities, the tests must be repeated at the Contractor's expense.

.3 Granulometric analysis: fill materials are tested to determine if they are suitable for their intended use and compliant with specifications.

.4 Wet density analysis: tests are performed on the compacted material in accordance with standard CAN/BNQ 2501-255/2013 Sols - Détermination de la relation teneur en eau-masse volumique - Essai avec énergie de compactage modifiée (2700 kN.m/m^3). (Soils – Determination of wet density – test with modified compacting energy).

.5 Compaction tests

.1 The Owner reserves the right to have compaction tests performed in order to verify that specified compactness has been reached. The Contractor shall assist in the performance of such tests and may not claim compensation for work stoppages or other losses of time resulting from performance of such tests.

.6 The frequency of tests is defined by the Ministerial Representative.

.7 The same Laboratory shall provide the Ministerial Representative progressive reports confirming that it has performed all tests ordered and that the test results are consistent with the plans and specifications. In addition, the Laboratory must provide the Ministerial Representative with a final report confirming that all fill material is consistent with the plans and specifications and that no laying of concrete or pavement was authorized before delivery of the report.

.8 If the Contractor uses a fill material other than that sampled for testing, all fill material must be removed and replaced at the Contractor's expense.

1.6 LABORATORY

.1 At the Ministerial Representative request, a Laboratory will be present on-site to perform qualitative tests on materials and to monitor their placing.

.1 In situ density test and other qualitative tests

.1 In the case of in situ density tests and other qualitative tests performed to verify the compaction of the infrastructure or of aggregate fills, the cost of the first test performed for acceptance of a layer of material in a given zone shall be covered by the Owner.

.2 However, if the results of such tests show the work not to be compliant with the standards listed in the specification, the Contractor must complete the repairs or take other necessary actions. Further in situ density tests shall then be at the Contractor's expense.

1.7 DOCUMENTS TO BE SUBMITTED

.1 Asphalt must meet the specifications of MTQ standard 4101. Asphalt shall be sampled at the production facility before work commences.

.2 Submit test results and the certificate issued by the manufacturer attesting that the bituminous binder to be used meets the requirements of the present section.

.3 Submit to the Ministerial Representative for approval the proportioning formula for the asphalt concrete mix together with test results for the mix, at least two (2) weeks before the beginning of work.

1.8 DELIVERY TICKETS

.1 Each load delivered to the site shall be accompanied by a delivery ticket in duplicate. The Ministerial Representative's representative must sign one copy as a receipt for the Contractor and keep the other copy.

1.9 PAVED ROAD

.1 Work involving paved roads involves, without being limited to, providing the materials and labour required to complete, according to the good engineering pratice, the construction of a road, including:

.1 Saw cuts in the existing pavement to keep,

.2 Planning of existing pavement on the distance required for connecting the asphalt,

.3 Excavation of the existing materials to the subgrade line required,

.4 The loading, transportation and disposal of excavation waste in a site compliant with the stipulations of the Soil Protection and Rehabilitation of Contaminated Sites Policy (Quebec department of environment, sustainable development and parks, hereafter MDDEFP),

.5 Supply and placing of fill material approved by the Ministerial Representative,

.6 The reconstruction of the cross section of the road including the platform road shoulders, the extra width of the shoulder for the installation of retaining devices used, the slope, etc.,

.7 Supply and laying of subbase and base course as specified in the plans and specifications,

.8 Supply and laying of layers of asphalt coating, base and surface courses, as specified in the plans and specifications,

.9 Supply and application of the tack coat.

1.10 ROAD MARKINGS

.1 Road-marking work involves, without being limited to, providing the materials and labour required to complete, according with the good engineering practice, marking of the road as specified in the plans and specifications, including:

.1 Supply and application of paint and reflective glass micro beads in compliance with the marking plans, and all related work including cleaning of surfaces prior to marking, if necessary.

1.11 REMOVAL OF EXISTING GUARD RAILS

.1 The owner will retain 20 meters of semi-rigid guardrails (those whose condition is the best, including posts, hardware and two round ends) from the guardrails that will not be retained for the purposes of work). Work involving the removal of existing guardrails involves, without being limited to, providing the materials and labour required to complete, according with good engineering practice, the removal of existing guardrails, including:

.1 Excavation and site preparation and the loading, transportation and disposal of excavation waste and debris in a site compliant with the stipulations of the Soil protection and rehabilitation of contaminated sites policy (MDDEFP),

.2 The removal of existing guard rails in the work area, and taking the necessary precautions to avoid damaging the rails and transportation of the guard rails kept

by the owner to the backyard of the Operational Center, 1501, Forillon Blvd, Gaspé, G4X 6L1.

.3 Levelling of the ground and blending with adjacent surfaces,

.4 The protection of existing guard rails to maintain,

.5 Cleaning of the site and removal of unusable material.

1.12 INSTALLATION OF NEW GUARDRAILS

.1 Work for new guardrails involves to provide the materials and labour required to complete, according to good engineering practice, the construction of new guard rails, including:

.1 Excavation and site preparation, loading, transportation and disposal of excavation waste in a site compliant with the stipulations of the Soil protection and rehabilitation of contaminated sites policy (MDDEFP),

.2 Supply and installation of posts and flexible guardrails,

.3 Levelling of the ground and blending with adjacent surfaces,

.4 Cleaning of the site and removal of unusable material.

1.13 INSTALLATION OF A NEW SEMI-RIGID GUARD RAIL END DEVICE

.1 The work on new semi-rigid guard rail device involves, without being limited to, providing materials and labor required to complete, according to good engineering practice, the construction of new semi-rigid guard rail end devices, including:

.1 Excavation and site preparation, loading, transportation and disposal of excavation surplus in a site compliant with the stipulations of the Soil protection and rehabilitation of contaminated sites policy (MDDEFP),

.2 Supply and installation of poles and semi-rigid guard rail end device;

.3 Levelling the ground and blending with adjacent surfaces;

.4 Cleaning of the site and removal of unusable material.

1.14 INSTALLATION OF SMALL SIGNAGE POLES

.1 Installation of small signage poles involves, without being limited to, providing materials and labor required to complete the construction of this work, including:

.1 Excavation and site preparation, loading, transportation and disposal of excavation surplus in a site compliant with the stipulations of the Soil protection and rehabilitation of contaminated sites policy (MDDEFP),

.2 Supply, installation and stabilization of poles;

.3 Levelling the ground and blending with adjacent surfaces;

.4 Cleaning of the site and removal of unusable material.

1.15 INSTALLATION OF SMALL SIGNAGE PANELS

.1 Works for the installation of small signage panels include the supply of materials, labor and equipment necessary for the panel implementation, loading, transportation. It also includes all the necessary hardware at the panel implementation on poles, i.e. the Contractor is paid by unit installed and shall provide shop drawings for approval for each panel.

1.16 SHOULDERS AND OVERWIDTH SHOULDER

.1 Shoulder work involves, without being limited to, providing the materials and labour required to complete, according to good engineering practice, the construction of a shoulder, including:

.1 Excavations to the required level,

.2 The reconstruction of shoulder and extra width of the shoulder for the installation of retaining devices,

.3 The loading, transportation and disposal of excavation waster in a site compliant with the stipulations of the Soil protection and rehabilitation of contaminated sites policy (MDDEFP),

.4 Supply and placing of fill material approved by the Ministerial Representative,

.5 Supply and laying of aggregates for the shoulder, as detailed in the plans and specifications,

.6 Levelling the ground between the shoulder and the limit slope.

1.17 DITCHES

.1 Work on ditches, according to cleaning and reshaping, are measured per cubic meter in the 2nd Class Excavated Material item in the Bid form and includes:

.1 Excavation (1st and 2nd classes),

.2 Loading, transportation, disposal and levelling of excavated material,

.3 Shaping to match the typical cross-section,

.4 Connections to existing ditches,

.5 Stabilisation slopes, if specified on the plans,

.6 Restoring the site to good condition.

PART 2 - PRODUCTS

2.1 AGGREGATES FOR SUBBASE AND BASE COURSE

.1 Aggregates used for the subbase and base course must meet the requirements of MTQ standards 2101 and 2102 and those of section 31 23 11 - Civil - Excavation and backfilling.

2.2 ASPHALT MIXES – HOT PREPARATION AND LAYING

.1 Definitions

.1 Asphalt mixes: An asphalt mix prepared and laid hot is a combination of new aggregates and bitumen, mixed hot in a mixing plant and designed to be laid while hot.

.2 Internal quality control: Quality control done by the Contractor responsible for supplying asphalt mixes.

.3 External quality control: Quality control done by an organization independent of the Contractor and paid by the Owner.

.4 Internal control tracking: Tracking of the Contractor's internal control results by the external control process.

.5 Process audits: Within a specific project, documented audit of the asphalt mix production process and of the implementation of quality management activities described in the Contractor's quality manual and in the quality plan and the control and testing plan.

.6 ISO 9001:2008: Standard that defines minimum requirements for a quality system.

.7 Reclaimed asphalt pavement: Asphalt that has been reclaimed either by milling or by in situ pulverization.

.2 Reference standards

.1 Hot mix asphalts must be compliant with the requirements indicated in the plans and specifications and with applicable standards from the MTQ's standard for road construction and maintenance (vol. VII - Matériaux). The applicable edition is the most recent as of the signing of the contract documents. The standards are:

.1 Standard 2101: Granulats (Aggregates)
.2 Standard 4101: Bitume (Asphalts)
.3 Standard 4201: Enrobés à chaud formulés selon le principe de la méthode Marshall (Hot mix asphalts formulated using the Marshall method])
.4 Standard 4202: Enrobés à chaud formulés selon la méthode de formulation du Laboratoire de chaussées [Hot mix asphalts formulated using the Laboratoire des chaussées (Quebec pavement laboratory) method]

2.3 CONSTITUENTS OF ASPHALTS PREPARED AND LAID HOT

.1 Asphalt

.1 Specifications

.1 The required characteristics and evaluation criteria for asphalts are found in MTQ standard 4101.

.2 The performance class of asphalts is defined by the expression PG H L, i.e.:

.1 PG: Performance Grade;

.2 H: temperature (in °C) above which the asphalt is likely to experience irreversible deformations;

.3 L: temperature (in °C) below which the asphalt is likely to crack due to thermal contraction.

.3 The performance class to be used is indicated in the specification. Class PG 64-34 is used for pavement.

.2 Quality assurances

.1 All asphalt used for producing asphalt mixes must be produced by a Producer holding an ISO 9001:2008 compliant quality certification (Quality system - model for quality assurance in production, installation and servicing).

.2 For each delivery of asphalt, the asphalt-mix Producer must obtain a certification of compliance from the asphalt Producer containing the following information:

.1 General information:

.1 Identification of the Producer and place of production;

.2 Performance class of the asphalt;

.3 The lot number;

.4 Production date.

.2 Characterization tests:

.1 Date of asphalt characterization;

.2 All tests in table 4101-1 of standard 4101.

.3 Control tests:

.1 Date of test;

.2 DSR (AASHTO TP 5) tests on the source asphalt:

.1 The high characterization temperature (Te)

.3 BBR (AASHTO TP 1) tests on the source asphalt:

.1 Stiffness value - So;

.2 Slope – *m* value.

.4 Recommendations – service temperatures

.1 Minimum and maximum storage temperatures;

.2 Minimum and maximum mixing temperatures(1);

(1) A range of 14°C is allowed for mixing. The interval is determined by applying a tolerance of ± 7°C to the optimal mixing temperature corresponding to a viscosity of 0.17 Pa-s. This temperature is determined using the MTQ's LC 25-007 testing method. In the event that this calculation yields a maximum mixing temperature above 170°C, the maximum mixing temperature is set at 170°C and the minimum at 156°C.

.2 Aggregates

.1 Aggregates used for preparation of asphalt mixes must be compliant with the requirements of MTQ standard 2101.

.2 For asphalt mixes formulated according to the Marshall method, aggregates must additionally meet the requirements of MTQ standard 4201. However, the polishing-by-projection coefficient requirement (LC-21-102) does not apply.

.3 For asphalt mixes developed using the Laboratoire des chaussées method, aggregates must additionally meet the requirements of MTQ standard 4202.

.4 Intrinsic and manufacturing characteristics are indicated in the contract documents. If omitted from these documents, the following characteristics apply:

TABLE - AGGREGATES

TYPE OF PAVEMENT	AGGREGATE SIZE	INTRINSIC CHARACTERISTICS CATÉGORY	MANUFACTURING CHARACTERISTICS CATEGORY
Local traffic, no buses	Coarse	2	A
	Fine	2	
All others	Coarse	2	A
	Fine	1	100% fractured

.5 Unless otherwise specified in the contract documents, fine aggregates must consist of manufactured sand or a combination of natural and manufactured sand, and coarse aggregates must be crushed quarried rock.

.3 Hot mix asphalt

.1 Hot mix asphalts must be produced in compliance with MTQ standards 4201 and 4202. The asphalt mixes must be produced by a firm operating a mixing plant

registered by a registrar accredited by the Standards Council of Canada or a recognized certifying body attesting that the Producer has a quality system compliant with ISO 9001:2008 "Quality system - model for quality assurance in production, installation and servicing."

.2 Reclaimed asphalt concrete, coarse and fine aggregates containing scoria and/or blast furnace residues must not be used in any asphalt mix.

.4 Resistance to rutting

.1 Requirements for rutting resistance of asphalt mixes as presented in tables 4201-1 and 4202-1 of MTQ standards 4201 and 4202 apply when the asphalt used is performance grade PG 64-34.

.5 Presentation of formulas

.1 The theoretical formula for the hot mix asphalt must be signed and dated by the Producer's quality control manager and supplied at least one week before delivery of the hot mix asphalt. One theoretical formula per type of asphalt mix must be produced for each type of binder or each change in aggregate supply. The characteristics given in the formula must be representative of the hot mix asphalt to be placed and compliant with the requirements of the applicable standard, specifically MTQ 4201 for hot mix asphalts formulated using the Marshall method and MTQ 4202 for hot mix asphalts formulated using the MTQ Laboratoire des chaussées method. The percentage of air voids in the mix to be produced from a formula must be 3 to 5% for surface layer and 2 to 6% for base layer.

.2 Each year, when starting up production, the Producer must perform an in-process evaluation of the formula as presented. The evaluation of the asphalt mix formula is made from the results of tests done by the Producer on five samples drawn from a representative production run. Two reference samples must be taken at the time of in-process testing, and the Producer must advise the Ministerial Representative of the date and place of the sampling, to which he may send a representative. The list of tests required for evaluation of the formula is presented in Appendix 1.

.6 Compliances

.1 Main characteristics

.1 In addition to meeting the requirements of the present specification, a lot is considered compliant following external control testing if, for the main characteristics, the deviation between the average results obtained for samples taken from the lot and the formula is within acceptable deviations (Et) indicated in the following table:

TABLE – MAIN CHARACTERISTICS

ACCEPTABLE AND CRITICAL DEVIATIONS FROM THE FORMULA					
Main characteristic	E_t for N = 1	E_t for N = 2	E_t for N = 3	E_t for N = 4	E_t for N = 5
% passing through the 80 µm screen - All mixes	1.7	1.2	1.0	0.9	0.8
Granulometric total - EB-20, EB-14, ESG-14 - EB-10S, EB-10C, ESG-10, EG-10	 40 30	 30 22	 24 18	 21 16	 19 14
Bitumen content - All mixes	0.45	0.38	0.31	0.27	0.24
Compactness - EB-20 - EB-14, ESG-14, EB-10S, EB-10C, ESG-10, EG-10	 4.0 4.0	 1.6 1.6	 1.2 1.4	 1.1 1.3	 0.8 1.0

* N = Number of samples

Note 1 For compactness, acceptable and critical deviations are applied to the minimum requirement of 92%.

Note 2 Acceptable and critical deviations apply to the mean value for the lot as compared to the formula.

Note 3 The values of the deviations indicated are expressed as percentages.

.2 Percentage air void

.1 A lot will be considered compliant if the percentage of air voids as established by standard LC 26-320 deviates less than 1.5% from the final asphalt mix formula.

.3 Correction factor

.1 No correction factor will be applied. If a lot does not comply with previous table, it will be rejected. The Contractor shall at his own expense remove all wrapped up this lot if it is already set up and start paving again to respect the differences allowed.

.4 Other characteristics

.1 Hot mix asphalt formulated using the Marshall method

.1 For hot mix asphalt formulated using the Marshall method (MTQ standard 4201) to be compliant, it must also meet the following criteria:

.1 In results of analysis for the first screen, in which retained material is permitted, the percentage of material passing through the screen must not be under the minimum requirement indicated in table 4201-1 of MTQ standard 4201 by more than 3%, and the requirement of 100% of material passing through the next largest screen must be met as stipulated in the same table;

.2 The values of physical characteristics (% air voids, asphalt film and filled VMA) presented with the formula must be targeted or met;

.3 In the event that one of these criteria is not met, each sample that failed to meet one or more criteria is to be analyzed separately for compliance with the requirements of table 4201-1 of MTQ standard 4201 in order to identify the source of bias;

.4 All asphalt mixes that do not meet the requirements stated in the plans and specifications shall be deemed defective, and the Ministerial Representative reserves the right to reject the work and have it re-done by the Contractor.

.2 Hot mix asphalt formulated using the MTQ Laboratory method

.1 For hot mix asphalt formulated using the Laboratory method (MTQ standard 4202) to be compliant, it must also meet the following criteria:

.1 In results of analysis for the first screen, in which retained material is permitted, the percentage of material passing through the screen must not be under the minimum requirement indicated in table 4202-1 of MTQ standard 4202 by more than 3%, and the requirement of 100% of material passing through the next largest screen must be met as stipulated in the same table;

.2 The percentage of "Marshall" voids exceeding 1.0% or deviating more than 1.5% from the average % of "Marshall" voids obtained during the in-process analysis of the theoretical formulas and the establishment of final formulas must be targeted or met;

or

The percentage of voids indicated in table 4202-1 of MTQ standard 4202 for each number of gyrations in a gyratory shear

compactor is targeted or met.
In the event that one of these criteria is not met, each sample that failed to meet one or more criteria is to be analyzed separately for compliance with the requirements of table 4201-1 of MTQ standard 4201 in order to identify the source of bias, and the Ministerial Representative reserves the right to reject the work and have the work re-done by the Contractor.
All asphalt mixes that do not meet the requirements stated in the plans and specifications shall be deemed defective.

.7 Types of asphalt mixes

.1 All asphalt mixes must resist rutting. Rutting resistance tests must be performed in compliance with MTQ standard 4201, in particular table 4201-1.

.2 The Contractor must supply a data sheet showing that the asphalt mixes are resistant to rutting.

.8 Acceptance inspection of pavement compactness and thickness

.1 This section does not apply to asphalt mixes used for patching or for correction before laying of the surface course.

.1 Verification of compactness using radiation-type densimeter

.1 The Owner verifies the compactness of asphalt pavement using a radiation-type densimeter.

.2 Calibration of densimeter

.1 For each mixing plant, the densimeter to be used is calibrated using the procedure defined in standard ASTM D 2950, "Standard test method for density or bituminous concrete in place by nuclear methods" or by comparison of densimeter results and core sample densities, done at least once per year per type of asphalt mix using an average of at least six core samples in order to correct the density reading obtained with the device.

2.4 TACK COAT

.1 The tack coat is a fast-curing RS-1 type bituminous emulsion. The tack coat must meet the requirements of MTQ standard 4105. Supply of the tack coat must meet the requirements of the MTQ's general specifications (CCDG).

2.5 PROPORTIONING FORMULA

.1 The proportioning formula shall be supplied by the Contractor and approved by the Ministerial Representative.

.2 The proportioning formula must be developed by a testing Laboratory approved by the Ministerial Representative.

.3 The formula cannot be modified without the approval of the Ministerial Representative. If the source of material changes, a new proportioning formula must be approved by the Ministerial Representative.

2.6 LIQUID DUST-CONTROL AGENT

1. When vehicles must drive on an aggregate surface and weather conditions cause excessive dust to be raised, hindering traffic and harming the environment, the Ministerial Representative may request that the surface be treated with a liquid dust-control agent consisting of a calcium chloride ($CaCl_2$) solution.

.2 The agent is to be applied to a levelled, prepared surface.

.3 The calcium chloride solution, which must be 35% by weight, is applied under pressure in one or two applications at the rate of 1.0 L/m^2 unless otherwise indicated.

.4 The aqueous calcium chloride solution must meet the requirements of standard NQ 2410-001 "Solution aqueuse de sels inorganiques utilisée comme abat-poussière" (Aqueous solution of inorganic salts used as dust-control agents).

.5 The Contractor shall ensure that the specified application rate is respected. No application is to be made during rain or on an excessively damp surface.

.6 If necessary, the Ministerial Representative may verify the compliance of the product. Sampling of the material on site is done from the spreader tank according to standard ASTM-D260, and analysis of the aqueous solution is done using the Solvay 832-A method or by densimetry. The samples are used for determining the quality and concentration of $CaCl_2$ in the solution. Solutions must be applied using a spreader with spray bar fitted with accessories appropriate to the work such as a tachometer, pump, pressure gauge and spray bar with jets and sprinklers.

.7 Application of liquid calcium chloride includes purchase, transportation, application and all other incidental expenses. This item do not appear on the bill and it's price must be included in the article "Site Organization".

2.7 ROAD MARKINGS

.1 Quality of paint

.1 The paint used for painting markings must meet the requirements of MTQ standard 10201 "Peinture alkyde pour le marquage des routes" [Alkyd paint for road markings] from the general standards (CCGD), most recent edition. The only products that will be considered are those previously approved via the most recent MTQ central laboratory call for tenders.

.2 Data sheet

.1 At the first site meeting, the Contractor must provide the Ministerial Representative with the paint manufacturer's data sheets, certifying compliance of the product. The data sheet must include full identification of the product, including:

.1 Manufacturer's name and address;
.2 Name of the product;
.3 Product code;
.4 The reference to MTQ standard 10201;
.5 Manufacture date;
.6 The colour and its code;
.7 The product's physical and chemical characteristics;
.8 Storage conditions;
.9 Instructions for pavement preparation;
.10 Methods and conditions of application specified by the manufacturer.

.3 Paint manufacture date

.1 All paint used for road markings must be from a batch produced not more than three (3) months before the date of application.

.4 Safety sheet

.1 Barrels must be labelled in compliance with standards for the identification of hazardous materials.

.5 Materials

.1 The Contractor must have at its disposal the required and appropriate materials for painting each type of line. The Ministerial Representative reserves the right to verify equipment, tools, materials, or employees scheduled to do the work at any time before or after acceptance of the agreement and to reject any inadequate or non-compliant device and/or any vehicle in poor condition.

.2 Spray guns must have a minimum pressure of 550 kPa.

.6 Micro beads for painting

.1 Micro beads must meet the following standards: BNQ 3820-200 and BNQ 3702-600 "Microbilles de verre pour peinture servant au marquage des routes" and MTQ 14601, "Microbilles de verre pour peinture servant au marquage des routes" [Glass micro beads for road markings].

.2 Micro beads are to be used for centre lines, stop lines, crosswalks and arrows. The rate of application of glass beads shall be 0.6 to 0.7 kg per litre of paint. Application of micro beads must be done mechanically and on the entire painted surface.

.7 Application of paint

.1 The Contractor shall apply the paint using a spray gun at the rate of 0.56 mm thick ± 0.04 mm (wet film) and apply the glass micro beads on wet paint at the rate of 0.6 to 0.7 kg/litre of paint. The method of micro bead application must be approved by the supervisor.

.2 Following application, fresh paint shall be protected by markers or cones for a minimum of one hour.

.3 The product must not be applied on longitudinal seams in the pavement or on crack sealant.

.4 The product must not be applied over existing marking materials.

.5 Measurement of wet film thickness of the paint for purposes of acceptance is done by the Laboratory engaged by the Owner in compliance with MTQ Roadworks standards (Tome V and VII).

.8 Colour

.1 The colour to be used for each element is indicated on the plans. All omissions or deviations must be brought to the attention of the Engineer as soon as possible.

.9 Quality of medium duration product

.1 Paint used for medium term markings must comply with MTQ standard 10202 "Peinture alkyde pour le marquage des routes" [Alkyd paint for road markings], most recent edition. The product must be resistant to damage from contact with sodium chloride or other chemical agents used for deicing the road and to contact with oils in paving products and motor oil.

.2 The product must be applied in its liquid state using a modified paint gun allowing the application of the product in a single coat 120 mm wide and 0.64 mm thick.

.3 In order to ensure retro-reflective performance, reflective glass micro beads shall be sprinkled on the paint immediately after application.

.4 Drying time must not exceed 60 minutes, after which time traffic must be allowed back on the road.

2.8 GUARD RAILS

.1 Guardrails are semi-rigid "GSR" and wooden poles and/or with steel cables as indicated on plans and specifications and with a stop plate in the format standardized DN-VIII-3 GF-001.

.2 Poles of the flexible guard rail must be installed at a minimum distance of 500 mm from the top of the slope.

.3 Installation of the slide flexible security must comply with the requirements of "Cahier des normes, Ouvrages routiers, Tome VIII – Dispositifs de retenue", latest edition.

.4 Wooden poles of dimensions 150 x 200 x 1830 mm will have 952 mm distance between them to meet the dynamic deformation of 600 mm, as specified in the standards. The steel poles of the proposed median semi-rigid guard rail, dimensions 150 x 200 x 1830 mm, will be installed at 1905 mm center to center and will respect the 900 mm dynamic deformation standards.

2.9 SEMI-RIGID GUARD RAIL END DEVICE

.1 Two types of end device are used in this project:

.1 ET-PLUS or SKT-350

.1 There are two types of semi-rigid guard rail end devices: ET-PLUS or SKT-350, as indicated on plans and specifications. Details and specifications of these products are on the list of MTQ's approved products.

.2 Eight (8) wooden poles, spaced with 1905 mm, are of the end device of an overall length of 15.25 m.

.3 A 500 mm flaring distance must be observed on the device in relation to the paving and a minimum distance of 600 mm to the relative to the slope.

.2 Round toe buffer and anchor device

.1 The round toe buffer and the anchor device indicated on plans and specifications must comply with the requirements of "Cahier des normes, Ouvrages routiers, Tome VIII – Dispositifs de retenue", latest edition (DN-VIII-3-GSR_0005).

2.10 SMALL SIGNAGE POLES

.1 Poles for small signage must be the same type as those removed by the Contractor or equivalent as approved by Ministerial Representative. The implementation of these poles must be done according to the existing conditions statement conducted at the beginning of the project by the Contractor to have poles at the same locations as their original location.

2.11 SMALL SIGNAGE PANELS

.1 Small signage panels are made from an aluminum alloy that must comply with the requirements of the standard 6401 from Tome VII – Materiaux of MTQ. Panel dimensions and tolerances must comply with the requirements established in the standards of road works of MTQ.

.2 The thickness of aluminum plates used depends on the dimension of the longest side of the panel (mm) and the dimensions should comply with the MTQ standards.

.3 The retroreflective sheeting and the colors used must comply with the requirements of the standards of Volume V - Traffic and 14101 Standard Volume VII - Materials from MTQ's

"Cahier des normes, Ouvrages routiers". Unlike what is stated in Volume V, the retroreflectivity level of retroreflective films must meet the new ministerial guidelines issued July 31, 2009 by the Ministry.

.4 Logos, pictograms and characters must be silkscreened according to the MTQ standards.

.5 The Contractor shall follow the manufacturer's instructions of the retroreflective films for storage panels if they cannot be installed right after manufacture.

.6 Unless otherwise specified, the lettering must meet the requirements of "Standard Alphabet for Highway Signs".

2.12 SHOULDERS

.1 Shoulders are made of compacted MG-20b rock and must have a uniform width, as specified in the plans and cross-sections. The work is done after the placing of each layer of asphalt mix (base and surface courses), once the pavement has cooled to below 50º C. Payment is made only once.

.2 The Contract can use materials from leveling as shoulder charging material upon approval by the Ministerial Representative

PART 3 - EXECUTION

3.1 GENERAL

.1 The construction of bases and pavement shall be done after spring thaw, once the site is completely free of snow-melt runoff water. The preparation and laying of asphalt mixes must be done in favourable weather and at an ambient temperature suitable for producing a smooth surface meeting the requirements of the present specification. It is not permitted to operate when moisture in aggregates affects the temperature of the mix or the pace of operations, or when the base is soaked or covered with puddles or mud. The temperature of the surface to be paved must be at least 10°C with an upward trend for a layer thickness lower than 50 mm. When the surface temperature drops below 7°C, no surface course may be laid without the Ministerial Representative written permission. At all times, the mix must be compacted until it reaches the specified density. No surface mix is to be laid after September 26 for layers less than 50 mm and October 24 for layers upper than 50 mm, without the Ministerial Representative permission.

.2 At all times, the Contractor must take the necessary steps to reduce to a minimum dust emissions caused by the work.

.3 The asphalt mix is composed of coarse and fine aggregates or fine aggregates alone, evenly coated with asphalt binder in a mixing plant and at a temperature favourable for mixing and laying.

3.2 ALIGNMENTS AND LEVELS

.1 All work must be done in accordance with the alignments and levels indicated in the plans and details.

.2 Except as otherwise indicated on plans, final resurfacing elevations must be the same as the elevations for connection to existing pavement.

.3 If obstructions or other circumstances not foreseen on plans disrupt the work so that changes are required, the Ministerial Representative may require that work be modified or moved.

3.3 CONNECTION TO THE EXISTING ROADWAY

.1 The connection to the existing pavement must be in accordance with DN-II-2-008 and as detailed plans. The Contractor makes the connection to the existing pavement and repairs the seal with the existing asphalt pavement as follows:

.1 Make a saw cut near the excavation and proceed with the road reconstruction;

.2 Following the excavation backfilling, the final layer of backfill materials MG-20b in the online infrastructure will be compacted to 95% PM at a thickness of 150 mm,

.3 Make a new saw cut in paving, at 3 m (min.) distance of foundations to preserve, remove the paving over this distance and excavate with slopes of 1.5 V; 1H up to 700 mm below the level of the road to connect with the proposed foundations;

.4 Proceed with the leveling of the existing pavement to a depth of 50 mm; from saw cut up to a distance of 1.5 m to the existing pavement to preserve,

.5 Coat the sides of the pavement with a tack coat before paving.

.6 Lay 100 mm of asphalt concrete in two layers: a first layer of asphalt concrete (base course) with a compacted thickness of 60 mm, and a second layer of asphalt concrete (surface course) of a compacted thickness of minimum 40 mm applied when deemed appropriate by the Ministerial Representative. These two layers of asphalt concrete must be bound together using a tack coat at the residual rate of 0,20 l/m^2.

.7 Only the top layer will be extended to the distance of 1.5 m previously leveled.

.2 The original lineage must be repainted and included in the price of pavement marking.

3.4 SUBGRADE PREPARATION

.1 This section covers the work to be done to ensure that the subgrade has the shape indicated by the longitudinal sections and cross-sections before proceeding with construction of the pavement structure.

.2 The Contractor shall carry out the excavation and profiling infrastructure, excavate and remove the backfill surplus. All materials should be disposed off-site, as described in Section 31 23 11 - Civil - Excavation and backfilling.

.3 The loading, transportation and disposal of excavation waste from subgrade preparation in a site compliant with the Soil protection and rehabilitation of contaminated sites policy (MDDEFP) shall be done at the Contractor's expense.

.4 Preparation of the roadbed where foundations for the various outdoor facilities will be built must comply with the relevant requirements of section 31 23 11 - Civil - Excavation and Backfilling and according to the recommendations of the geotechnical tests.

.5 Subgrade preparation includes grading work necessary for creating a roadbed on which will be built the foundations of road infrastructure, as per the profile indicated on the plans and details. The roadbed must be profiled in order to allow drainage of foundations to ditches. The subgrade must be smooth and free of ruts and depressions. The topsoil layer in the traffic lane must be excavated and stockpiled.

.6 The surface to be prepared must be perfectly drained beforehand and for the duration of preparation work. If there are small inequalities, deviating less than 50 mm from the required profile, it is sufficient to level the entire surface with a grader, then to compact the surface with the appropriate tools. If the surface is rough or uneven, the Contractor must first scarify it until depressions bottom level and restart compacting operations.

.7 If it is impossible to obtain an even, stable surface due to the presence in the subgrade of materials in poor condition, these materials must excavated.

.8 Any borrow required for filling such excavations must be of a quality acceptable to the Ministerial Representative.

.9 Before laying subbase or base course materials, the evenness of the surface is to be verified by the Ministerial Representative. The laying of the foundation or subgrade cannot begin until the Ministerial Representative has accepted the infrastructure.

.10 Next, compact with backfill in thickness of at least 300 mm, so that the compactness of subgrade soil is everywhere at least 95% of its maximum dry density as determined via the modified Proctor test.

.11 All subgrade surfaces that are not accessible to heavy compacting machinery shall also be perfectly compacted, using appropriate small machinery or a vibrating plate.

.12 Any soft or unstable points must be excavated and filled with more stable material with similar grain size distribution to surrounding materials.

.13 At locations where the ground profile must be raised to the level of the planned subgrade, the Contractor must plan for raising with modified MG-112, in layers 300 mm thick and compacted to 95% of maximum density as determined by the modified Proctor test.

.14 After compacting and profiling the roadbed, the Contractor must, as soon as possible, begin construction of the subbase so that the subgrade is not excessively exposed to the elements and altered as a consequence.

3.5 SUBBASE

.1 Generalities

.1 The subgrade surface must be prepared according to the requirements of the articles titled "Compacting of materials" and "Subgrade preparation." The thickness of the sub foundation is 450 mm of granular materials MG-112. Aggregates are spread in layers of uniform thickness not to exceed 300 mm. The spreading method used must prevent all segregation of aggregates.

.2 Compacting is then done using the method described under "Compacting of materials." The required degree of compactness is 95% of maximum dry density as determined by the modified Proctor test.

.3 Before laying the subbase, the top subgrade must be free or ruts or other depressions and must not deviate by more than 10 mm from the levels and longitudinal and cross sections shown on the plans.

.2 Construction method

.1 Subbases are then constructed in successive layers. Specified aggregates are spread across the entire width of the subgrade or sub foundation at a uniform thickness, without segregation, in compliance with the cross section of the planned pavement. The surface is then levelled and, if necessary, moistened or dried in order to obtain the desired compactness.

.2 Each layer must be compacted separately in compliance with the requirements of the section on "Compacting of materials." The required degree of compactness is 95% of maximum dry density as determined by the modified Proctor test. Areas that are difficult to access must be compacted manually using appropriate tampers, special compactors or vibrating plates.

.3 The Contractor shall also include the costs of the following procedure: laying of the subbase and base course, adjustment above public utilities to 100 mm ± 25 mm below the level of the surface course.

.3 Shaping

.1 The final shaping of the street must have a slope and a path according to the plans and longitudinal sections and must comply with tilt, slopes, horizontal and vertical curves and connect perfectly to the existing pavement in levels and in curves.

.4 Unstable or contaminated areas

.1 If weak points slump under the compactor or subgrade soil or mud mix with the subbase, such unstable or contaminated materials must be removed and those portions of the subbase shall be rebuilt after strengthening of the subgrade.

.5 Subbase cleaning

.1 If paving is done long after the subbase is constructed, the subbase is to be decontaminated. Such work includes the removal and transportation of materials deemed by the Ministerial Representative to be contaminated, and the shaping and compaction of the subbase.

.6 Placing

.1 The contractor shall build:

.1 A sub foundation 450 mm thick made of MG-112 with crushed stone coming from a quarry compacted to at least 95% of the modified Proctor value and in compliance with standard CAN/BNQ 2501-255/2013.

.2 A base course 150 mm thick made of MG-20 type crushed rock compacted to at least 95% of the modified Proctor value and in compliance with standard CAN/BNQ 2501-255/2013.

.3 Acceptance of material and density tests are described in section 31 23 11 - Civil - Excavation and Backfilling

.4 At the joint between new and existing pavement structures, a transition must be made in the various foundation layers with a slope having a ratio of 1.5 V : 1 H.

3.6 PAVING

.1 General

.1 Materials (finishers, compactors, etc.) and the use of asphalt mixes must be compliant with the requirements (technical only) described in section 13 - Revêtement de chaussée en enrobé [asphalt road paving] of the MTQ's general specifications (latest edition).

.2 The payment terms described in section 13 - Revêtement de chaussée en enrobé of the MTQ's general specifications (latest edition) do not apply to this project.

.2 Transportation of mix

.1 The mix must be transported to the site in sealed (boxed) vehicles. All loads must be delivered early enough to allow for spreading and rolling in daylight. It is never permitted to overheat a mix to counteract cooling caused by travel time, no matter how long the trip.

.3 Asphalt covering

.1 The asphalt covering will be composed of:

.1 A base course 60 mm thick made of asphalt mix, minimum 93-98% type ESG-14 (PG64-34 asphalt) (LC 26-040/045), conducted in summer 2014.

.2 A surface course 40 mm thick asphalt mix, minimum 93-98% type ESG-10 (PG64-34 asphalt) (LC 26-040/045), conducted in summer 2014.

.2 Each layer of asphalt mix must have a uniform texture, free of segregation or bleeding, be regular and compliant with the profiles specified on the contract drawings. Cross sections and longitudinal sections of the paved surface must allow for water runoff to catch basins, with no accumulations of standing water. After the final compacting of each course, the Ministerial Representative will verify the alignment and slope. The profile of each course must not deviate by more than 6 mm (1/4 in) per 3 m (10 ft) from the profile specified on the contract drawings. The thickness of each layer must not deviate by more than 6 mm (1/4 in) from the specified thickness.

.3 Run-off slopes on hard surfaces must not have a grade less than 1%, unless otherwise indicated.

.4 Tack coats

.1 The Contractor must apply a tack coat to surfaces to be paved, in the form of an RS-1 type emulsion in compliance with the MTQ's general specifications (latest edition). On horizontal surfaces, the tack coat is applied uniformly using a spray bar under pressure.

.1 At the residual rate of 1.20 L/m^2 for binders on aggregate surfaces (when required);

.2 At the residual rate of 0.20 L/m^2 for the tack coat on a paved, planed or newly paved surface.

.2 The Contractor shall take all necessary precautions to ensure that a tack coat does not spill onto already paved adjacent surfaces or surfaces that are not going to be covered with asphalt.

.3 While the binder is curing, vehicle traffic must be detoured or controlled.

.4 If is forbidden to apply binders during rain or on wet or frozen surfaces or when, unless recommended by the manufacturer, the ambient air temperature is below 10ºC.

.5 A surface to which a tack coat has been applied must be covered with the new asphalt course the same day if the road is open to traffic overnight.

.6 All transverse joints and longitudinal seams must be brushed with an even coat of binder at the rate of 0.4 L/m^2.

.7 When building a cold longitudinal or transverse seal, using an adhesive for *crafco* seal or equivalent shall be applied.

.8 Cutback is not to be used for tack coats.

.5 Application of asphalt mix

.1 Mechanical

.1 Comply with the technical requirements of section 13 - Revêtement de chaussée en enrobé of the MTQ's general specifications (latest edition).

.2 When mixing and aeration of the asphalt mix are complete, use the paving machine to spread the mix to the desired elevations.

.3 All surface, base and subbase courses are to be spread mechanically using a self-propelled paving machine driven by a competent operator. Adjustments to the subgrader, tampers, distributor screws, etc. are to be verified regularly to ensure that the mix has a uniform texture devoid of tearing, deformations or grooves. The operating mode (stop time, speed, etc.) of a paving machine must be such as to allow the laying of a course with the correct density and other characteristics. All asphalt mixes whose composition or temperature is non compliant must be rejected.

.2 Joints and seams

.1 Longitudinal seams must be parallel to the alignment lines. The paving machine must travel on a line parallel to the centre of the road. When two paving machines are working in echelon, the first follows the line and the second follows the edge of the strip of asphalt laid by the first. In order to achieve a hot, easily compacted seam, the two pavers are to drive as close to one another as possible and in no case separated by more than 75 metres. When a single paving machine is used, the mix is laid in alternation on either side of the road in strips not exceeding 200 metres in length in warm weather and 50 metres in cold weather. The Ministerial Representative may make an exception to this rule and indicate a more suitable sequence considering the thickness of the mix, the temperature and the hourly production of the central plant. Whenever possible, the laying of asphalt at the end of the day is to be organized so as to avoid leaving any longitudinal seams to be completed the next day. Joints between new and old pavement and between pavement laid on consecutive days are to be made with care in order to produce a perfectly continuous connection. In order to obtain well-made transverse joints, the edge of the previously laid course must be cut to the full depth, brushed with an even coat of emulsion and heated so as to make a heat seal.

.3 Irregularities

.1 Immediately after laying a course and before rolling, the surface is verified and any irregularities remedied. Accumulations of materials due to the grader are removed with a shovel or hoe. Scalloping or other depressions are filled with hot mix and levelled. It is strictly forbidden in such cases to throw the mix in a manner that causes it to fan out.

.4 Manual spreading

.1 In locations that the paving machine cannot reach, hot mix is spread manually. This must be done carefully. The mix is applied evenly and spread in a loose layer of uniform density using rakes or hoes, taking care to avoid segregation. Before rolling, take care to check the surface with a rule and remedy any irregularities. Areas surrounding structures and covers and hard-to-access locations must be compacted with a hot iron.

.5 Cleaning of manual tools

.1 When manual tools are cleaned by flame, take care not to heat them to temperatures hot enough to burn the mix. When manual tools are cleaned with oil, the oil container is to be placed in a location where it cannot contaminate the mix.

.6 Compacting

.1 Generalities

.1 The instructions in the following articles are applicable to all pavement courses.

.2 Rolling must begin as soon as the mix is strong enough to support the roller without significant deformation.

.3 For initial rolling, use multiple-tire rollers. Rolling is completed with a steel roller that must produce a smooth, even surface compliant with the elevations indicated on the plans.

.2 Number of rollers

.1 The minimum number of rollers is two (2). However, the actual required number is that which makes it possible to create an asphalt coating whose surface course and density meet specifications.

.2 Rolling must be completed before sunset. An exception may be made to this rule if the Ministerial Representative deems that satisfactory precautions are being taken.

.3 Rolling sequence

.1 The rolling sequence must be such that the asphalt coating has a surface course and compactness that meet specifications and that transverse joints and longitudinal seams are completely waterproof and are practically identical to the rest of the surface.

.4 Temperature control

.1 Storage temperature and central plant mixing temperature of the asphalt must be less than or equal to the maximum temperatures

indicated on the asphalt's certificate of compliance.

.2 The decline in temperature of an asphalt mix between mixing and laying on the site must not exceed 15ºC.

.3 All mixes that fail to meet these requirements shall be rejected.

.4 Traffic must not be allowed to use freshly laid asphalt until the temperature of the surface has cooled to less than 50ºC.

.5 Checking compactness

.1 Rolling is to continue until the mix reaches the required density.

.2 The Contractor is free to check the compactness of each layer using the method of its choice. Compactness must be between 92.0 and 98.0% of that indicated by standard LC 26-320.

.3 All layers of asphalt must be compacted to at least 92% of the maximum density indicated by standard LC 26-320.

.7 Quality and evenness of asphalt

.1 The surface of each layer (surface course, binder, base) must have a uniform texture, free of segregation, and be regular and compliant with prescribed alignments and slopes.

.2 After final rolling of each course, the Ministerial Representative verifies alignments and slopes. The profile of each course must not deviate from the prescribed profile by more than 6 mm. All irregularities or depressions greater than 5 mm per 3 m on surface courses or 6 mm per 3 m on other courses must be corrected.

.3 Verification of irregularities is done using a 3 m rule fitted with a level, which the Contractor must have at its disposal on the site at all times.

.4 Any defective section must be replaced or remedied to the Ministerial Representative's satisfaction before he allows another course to be laid or accepts the completed work. The mix used for correcting depressions must be such that the nominal diameter of the largest particle is smaller than the mean depth of the depression.

.8 Determination of compactness

.1 The compactness percentage is determined by the gross density of the mix (specific gravity measured by radiation-type densimeter divided by the specific gravity of water at 25°C, i.e. 997,044 kg/m^3) divided by the maximum average density on that day as measured during receiving inspection of the asphalt mix, multiplied by 100.

3.7 DAMAGE TO EXISTING PAVEMENT

1. If Contractor damages the existing pavement outside the limits of work, repair and connection to the existing pavement must be made in accordance with section "Connecting to the existing pavement. However, this work will not be paid as additional amount and repair is at Contractor' expense.

3.8 CONTROL

.1 Notify the Ministerial Representative and the Laboratory at least 24 hours before laying any asphalt mix.

.2 While asphalt mix is being laid, a representative of the Laboratory must collect samples and be present for the work. Tests must be done by the Laboratory designated by the Owner. The cost of these tests and supervision shall be borne by the Owner.

.3 Each layer of asphalt mix must be compacted to 92% of the maximum density as specified in standard LC 26-320.

.4 All asphalt mixes must be resistant to rutting. Rutting resistance tests must be performed in compliance with MTQ standard 4201, in particular table 4201-1.

.5 The Contractor must supply a data sheet demonstrating that asphalt mixes are resistant to rutting.

3.9 WASTE MATERIAL

.1 Waste material shall be disposed of in compliance with section 31 23 11 - Civil - Excavation –and Backfilling.

3.10 SAMPLING SEQUENCE FOR ASPHALT MIXES

.1 Generalities

.1 Tests required for each analysis type are presented in the following tables:

.2 Production-reference

.1 For the asphalt mixes in Tableau 4201-1, a type C analysis is required on each of five production reference samples. Type E analysis must also be performed on one of the five samples.

.2 For the asphalt mixes in Tableau 4202-1, a type B analysis is required for each of the five production reference samples. Type E and type D analysis must also be performed on one of the five samples.

.3 In production

.1 For each lot, the following analyses are required:

TABLE - TYPES OF ANALYSIS REQUIRED FOR EACH SAMPLE

	REFERENCE STANDARD	
NUMBER OF LOT SAMPLE	**4201**	**4202**
1	B	B + D
3	B	B
All other samples	A	A

TABLE – LIST OF TESTS REQUIRED FOR EACH ANALYSIS TYPE

		ANALYSIS TYPE				
DESCRIPTION	**STANDARD**	A	B	C	D	E
Granulometric analysis	LC 26-360	x	x	x		
Determination of filler mass in excavated material	LC 26-110	x	x	x		
Determination of bitumen content	LC 26-100	x	x	x		
Determination of maximum density	LC 26-045	x	x	x		
Determination of percentage of air voids and compactness in compacted hot mix asphalts	LC 26-320		x	x		
"Marshall" method for determining sample resistance to deformation				x		
Determination of compactability of hot mix asphalts using gyratory shear press	LC 26-003				x	

Water content	LC 26-001					x
Resistance to rutting (**Note 1**)						x

Note 1: The rutting test is required when the asphalt used is performance class PG 64-34; for other performance classes the test is required when stipulated in the contract documents.

3.11 ROAD MARKINGS

.1 Generalities

.1 The location of the work is indicated on the plans provided with the proposal. The Contractor shall perform the marking work in compliance with the standardized plans and following the details shown on the Owner's sample plates and those appearing on the proposal plans or in accordance with the Ministerial Representative instructions.

.2 Pavement markings have the following colour and width:
.1 Lines marking parking spaces: 125 mm (5 in), white

.3 All materials such as paint, thinner, micro beads and other equipment, tools and labour for performing the work are supplied and paid by the Contractor.

.2 Scope of work

.1 Marking with the medium-duration product shall include:
.1 Centre lines;
.2 Division lines (solid and broken).

.2 Marking with paint shall include:
.1 Stop lines;
.2 Crosswalks;
.3 Arrows;
.4 Symbols for reserved lanes.

.3 The Contractor shall do the pre-marking with retroreflective disks.

.4 Designated locations are shown on the plans and may be modified upward or downward upon written instruction from the Ministerial Representative.

.5 In its bid, the Contractor shall indicate the equipment and labour that it intends to make available to the Owner for carrying out the work.

.6 In case of a subcontracted contract, the subcontractor shall be governed by this specification. The Contractor shall be responsible for all flaws or unjustified delays in work done by its subcontractor.

.3 Conditions for applying paint

.1 One of the quality criteria for ensuring high-performance markings is the controlled application of paint:

.1 Paint must be applied on clean, dry surfaces.

.2 Places susceptible to accumulations of foreign matter such as rocks, soil, oil, etc. must be completely cleaned before painting. Mechanical street sweepers are recommended for this work.

.3 To achieve uniform, satisfactory results, the speed of the painting truck must not exceed 20 km/h.

.2 Paint must not be applied to the pavement in the following conditions:

.1 Wet pavement.

.2 There is a risk of the paint being exposed to rain before a reasonable drying time has elapsed.

.3 The air temperature is below 10ºC (50ºF) or above 32ºC (90ºF).

.4 Relative humidity is above 85%.

.5 The pavement is covered with soil, debris or other dirt that can impede painting.

.3 The Contractor is not to use any thinner to accelerate drying or for any other reason.

.4 Application of markings in parking lots

.1 Premarking must be done with white and yellow depending on line position, and must be masked as well as possible by the final painting.

.2 Only centre lines and pedestrian and school crosswalk lines not at intersections are painted yellow unless otherwise indicated in the marking plans.

.3 The proportioning characteristics of the paint and micro beads are the following:

.1 Rate of application for unbroken line: 75 L/km (27.5 gal (UK)/mi),

.2 Thickness of line: 0.60 mm (0.024 in) (fresh paint), tolerance 10%,

.3 Kilograms of micro beads per litre of paint: 0.60 kg/L (6 lb/gal (UK)) minimum, tolerance 10%,

.4 Concerning the application of micro beads, it is imperative that they be applied uniformly over the entire marked surface in order to provide maximum effectiveness.

.4 Cones must not be removed before the paint is dry. The Contractor must install the cones no more than 15 m (50 ft) apart. The cones must be 450 mm (18 in) high and class II as described in the BNQ traffic cones standard ("Cônes de signalisation"), NQ 1941-501.

.5 The Contractor is responsible for removing by abrasion any paint spread by vehicles contacting the paint before drying, spilled by accident on the pavement or used for applying markings due to Contractor error.

.6 Corrections must be made by abrasion assisted by specialized material, and not through the use of neutralizing paint, and there must be no visible paint marks after removal work.

.7 All errors on the part of the Contractor must be rectified within seventy-two (72) hours or less.

3.12 APPLICATION OF MARKINGS

.1 Conditions for application of medium-duration product

.1 In order to ensure the best possible adhesion, the product must be applied in liquid form between 10 ºC and 50 ºC.

.2 Ensure that the surface is clean and dry. For new pavement, ensure that all traces of oil have been removed.

.3 For markings on old surfaces, ensure that the surface is completely dry and clear of dust and sand or any other substance that may impair the product's adhesion to the pavement.

.4 Do not apply medium-duration product over existing lines when said lines are made of paint, urethane or epoxy resin. The product may be applied over the same product or over thermoplastic.

.2 Premarking the pavement

.1 When the Contractor lays the asphalt mix, it must apply temporary markings with reflective discs, delineators or equivalent devices, no more than 10 m apart and no more than 5 metres apart on curves and lane separation lines, before allowing traffic to return to the road.

.2 Premarking distances during work must respect the spacing indicated in articles 16.9.1 and 16.9.2 of the MTQ's general specifications (CCDG 2014).

.3 Premarking must be done with premarking discs. The premarking must be done on lane separators, edge lines and approach-nose lines.

.4 The Contractor must pay special attention to the manner in which premarking is done. The premarkings must be of a width that ensures they will be completely covered by the newly paved lines and will not be visible after the work is complete.

.5 Yellow or white reflective premarking discs must be thermoplastic, rotproof, non absorbent, chemically stable up to 200 ºC and inert in the presence of sodium

chloride or calcium chloride. Retro-reflectivity, flexibility and durability must meet BNQ standard 6830-101. The diameter of discs must be 95 to 100 mm with a thickness of 1.5 to 2 mm including adhesive. The method of adhesion to the pavement must be by pressure, with no protective paper.

.6 All costs associated with installation of premarkings, including purchase, delivery and installation, are included in the bid.

.3 Dimensions of markings

.1 For lane demarcations, the medium-duration product must have a minimum thickness of 0.64 mm and a nominal width of 125 mm. Tolerance for the width of markings is +10% and -5%. In the case of double lines, the distance between the lines is 120 mm.

.2 The dimensions and placement of lines and arrows must comply with the Ministerial Representative instructions for painted markings.

.4 Alignment

.1 For lane separators, the alignment must be followed within + or – 25 mm with relation to the marking plan or the Ministerial Representative instructions.

.2 During application, it is important to paint very straight lines to avoid subjecting drivers to a visual zigzag effect.

.5 Spacing

.1 The spacing between lines must correspond to the marking plan or to the Ministerial Representative instructions.

.6 Removal of lines

.1 Upon approval by the Ministerial Representative, the Contractor must erase lines in locations where required for application of new markings to industry standards.

.2 Note that all traces of markings must be removed.

.3 If the Contractor will not apply markings to the road within 24 hours, it must install delineators after removal of the lines.

.7 Planning and removal residues

.1 Planing and removal residues must be disposed of in compliance with existing environmental laws and regulations.

.8 Work plan

.1 Before beginning the work, the Contractor must prepare and provide to the Ministerial Representative for approval a work plan for the markings. After receiving approval, the Contractor must adhere to this plan unless the Contractor and the Ministerial Representative reach an agreement on the modification of said plan.

3.13 MARKING PROTECTION

.1 Protect marking until the paint is dry.

.2 Repair damages done to adjacent surfaces, due to marking work.

3.14 SUPERVISION

.1 Quality control

.1 At least twice a day, the Contractor must test the thickness of the wet paint film and measure the width of markings. Thickness measurement shall be done with an interchemical thickness gage before the application of glass micro beads.

.2 The Contractor must test the thickness of the paint film and the width of the lines. Thickness is measured using an interchemical thickness gage.

.3 A copy of the thickness tests must be submitted to the Ministerial Representative, who may perform certain tests including a thickness test without prior notice to the Contractor and with the Contractor's cooperation.

.4 All non-compliant work shall be re-done at the Contractor's expense.

.5 The disposal of waste material will be done in compliance with section 31 23 11 - Civil - Excavation and Backfilling

.2 Laboratory tests

.1 Samples may be collected by the Laboratory in order to check the compliance of materials used. If a sample tests non-compliant, all of the remaining product shall be replaced and the Contractor shall reimburse the Owner for all testing and control costs.

.2 Sampling of the product is done by the Laboratory during execution of the work. The Contractor shall cooperate with Laboratory personnel in facilitating sampling of the product.

.3 If the paint is found to be non-compliant, the Ministerial Representative may call a halt to the work. The Contractor shall then be required to prove the compliance of the product it wishes to use before being authorized to continue the work.

END OF SECTION

PART 1 - GENERALITIES

1.1 RELATED SECTIONS

.1 Section 31 00 00 – Generalities (Civil)

.2 Section 31 11 00 – Clearing and Grubbing

.3 Section 32 11 00 – Roadworks

.4 Section 33 31 00 – Culverts

1.2 SCOPE OF WORK

.1 Ensure supervision of the work and supply all manpower, equipment, tools, materials, transportation and other services required to carry out and complete the work described and specified in this section and contract documents, including but not limited to: the excavation and backfilling of specified areas and the application of stockpile topsoil and humus in preparation for revegetation on shown areas on drawings.

1.3 REFERENCES

.1 Bureau de normalisation du Québec (B.N.Q.).

.1 NQ 0605-100/2001 : Landscaping using vegetation.

1.4 PARKS CANADA'S REQUIREMENTS

.1 It is strictly forbidden to import topsoil or plant from outside Forillon National Park unless the ministerial Representative say so.

.2 Existing humus and topsoil must be removed and stockpiled and put for later use. The stockpiles must be covered to protect materials from weather.

.3 If required of topsoil or plant from outside Forillon National Park, they must be approved by the Ministerial Representative.

1.5 ELEMENTS TO BE SUBMITTED

.1 Advise the Ministerial Representative of the proposed source of topsoil or vegetation and provide access allowing said representative to conduct the analysis of materials, The acceptance of the topsoil will depend on the results of soil analyses and the inspection, Work shall not start until the topsoil or plant have been approved by the Ministerial Representative. The only place where the Contractor may be authorized to recover the topsoil within the limits of Forillon National Park, other than the work limits is the new limit of section 2, as shown in the sketch annexed to the specifications. The Contractor shall obtain the approval of Ministerial Representative before any action.

.2 Topsoil tests and analyses shall be carried out by a laboratory with the Owner assuming the cost of these.

.3 Analyze the topsoil prior to stripping and stockpiling to determine its contents of clay, sand, mud, phosphorous, potassium (NPK), magnesium (Mg), soluble salts, growth inhibitors, and soil sterilizers as well as its pH.

.4 Provide the Ministerial Representative with a copy of the soil analysis report as well as recommended soil improvements.

.5 Submit a copy of the technical characteristics of biodegradable coconut net or approved equivalent

1.6 WORK SCHEDULE

.1 Topsoil shall be spread and finish earthwork carried out at the appropriate time for undertaking sodding work under the best possible conditions, immediately to ensure recovery plant.

1.7 TOPSOIL AND FINISH EARTHWORK

.1 Topsoil and finish earthwork consist in, but are not limited to, supplying the materials and manpower required to carry out the spreading of topsoil and finish earthwork, according to good engineering practices, including:

.1 Stripping topsoil and humus and stockpile for later reuse.

.2 Supply and application of stockpiled topsoil and humus to a minimum thickness of 150 mm where specified by the Ministerial Representative.

.3 Topsoil mixes including granulometry and specified amendments.

.4 Finish earthwork.

.5 Finish levelling according to specified tolerances.

.6 The cleaning and off-site disposal of non-reusable materials at a location complying with the directives of the MDDEFP's Soil Protection and Contaminated Sites Rehabilitation Policy.

PART 2 - PRODUCTS

2.1 SOIL

.1 Loam: loose soil, neither too rich in clay nor too poor in sand, whose organic content varies between 4 % and 5 % for sandy loam and between 2 % and 3 % for clayey soil, the maximum admissible humus being 20 %. This soil's pH must be between 5.5 and 7.0. The soil must also be free of subsoil, roots, vegetation, debris, toxic matter and stones more than 50 mm in diameter.

.2 Black soil (humus): consisting of decaying products, sufficiently supple and homogeneous, free of colloidal residue, wood, sulfur and iron, containing less than 60 % of organic materials by weight, and having a maximum water content of 15 %, The size of the shredded particles must be equal to or smaller than 6 mm.

2.2 MIX OF SCREENED TOPSOIL

.1 Mix for areas to be sodded and seeded:

.1 Two parts loam.

.2 One part black soil.

.3 One part coarse sand.

.4 3 % to 7 % organic matter.

2.3 CHARACTERISTICS OF MIXES

.1 The cation exchange capacity (C.E.C.) must be between 10 and 20.

.2 The chemical verification of the soil shall be carried out using the "Walkey Black" oxidation method.

.3 The acidity level (pH) must be 6.5.

.4 Include the following chemical element in the proportions shown:

Chemical elements	**Proportion**
Phosphorous (P)	100 ppm
Potassium (K)	125 ppm
Magnesium (Mg)	200 ppm
Calcium (Ca)	2 000 ppm

.5 Fall within the following grading range:

Screen	**Passing %**
10 mm	100
5 mm	98 to 100
1,25 mm	90 to 97
630 µm	65 to 90
315 µm	25 to 65
160 µm	15 to 25
80 µm	5 to 15

.6 Water retention capacity: maximum 20 %.

PART 3 - EXECUTION

3.1 PREPARATION OF EXISTING AREA

.1 Level the ground, filling dips and creating a slope favoring the flow of water, Remove soil that has been contaminated by toxic materials, Remove debris as instructed by the Ministerial Representative.

.2 Loosen to a depth of 100 mm the entire area covered by the foundation layer to be covered in topsoil, Repeat the operation wherever the transportation material and spreading of the soil have compacted said foundation layer.

.3 Clear the surface of debris, roots, vegetation branches and stones more than 50 mm in diameter.

3.2 SPREADING OF THE TOPSOIL

.1 Areas to revegetation.

.1 Have the Ministerial Representative inspect and approve the condition of the foundation layer before starting to spread the topsoil.

.2 Where revegetation work is to be carried out (as specified by the Ministerial Representative and the plans), spread the topsoil and humus on the approved and non-frozen foundation layer in even layers containing an adequate amount of water.

.3 Spread the topsoil according to instructions, to a thickness of at least 150 mm on the areas or according to the Ministerial Representative request.

.4 Manually spread topsoil around trees and plants where machinery is not allowed.

.5 Unless otherwise indicated on the drawings, spread topsoil to a thickness of at least 300 mm for ornamental grass trenches, 400 mm for shrubs and 1 000 mm for trees.

.6 Take into account 25 % settling of soil volume when placing the soil, to comply with projected levels.

3.3 FINISH EARTHWORK

.1 Level and move the soil so as to eliminate any irregularities and dips, ensuring the flow of surface water. Apply a layer of loosened loam, breaking it up and raking it.

3.4 RESTORATION OF STOCKPILING AREAS

.1 Restore the condition of the stockpiling areas used for the work, to the satisfaction of the Ministerial Representative.

3.5 SURPLUS MATERIALS

.1 Excavation surplus refused by the Ministerial Representative for the project's backfilling purposes (except for contaminated materials, demotion materials and special waste) can be disposed of on a site chosen by the Contractor, outside limits of Forillon National Park, with the applicable municipal authorities. Once disposal has been completed, materials must be leveled to the satisfaction of the land's owner(s). The Contractor must obtain a letter of authorization from each owner of the land used for the disposal of materials. Provide to the Ministerial Representative a copy of the letters and Gaspé Town's authorizations prior to materials transportation.

.2 All of the aforementioned disposal work must be carried out in compliance with the MDDEFP's Directives and/or Regulations which, in the event of discrepancy with the above, will prevail over the preceding requirements.

.3 All expenses relating to the use of a disposal and/or landfill site, including the cost of any permit and/or authorization, as well as loading, transportation and disposal costs are at the Contractor's expense.

3.6 CLEANING

.1 Clean in accordance with the section 01 74 11 - Cleaning.

.2 Once completed, remove surplus materials, waste materials, tools and safety barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures

1.2 MEASUREMENT AND PAYMENT

.1 Measure hydraulic seeding square meters of actual surface area for:

.1 Grass mixture including fertilizer.

.2 Legume mixture including fertilizer.

.3 Areas of blending into existing turf grass will not be measured for payment.

.2 Measure maintenance during establishment period and warranty period of areas seeded in square meters.

.3 Payment for seeding made at unit price bid of actual area surface measurements taken and computed by the Ministerial Representative.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 11 00 - Summary.

.2 Scheduling:

.1 Schedule hydraulic seeding to coincide with preparation of soil surface.

.2 Schedule hydraulic seeding using grass mixtures and mixtures containing Crownvetch and/or Trefoil between dates recommended by Provincial Agricultural Department.

1.4 REFERENCES

.1 Canada Green Building Council (CaGBC)

.1 LEED Canada-NC Version 1.0-2004, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum 2007).

.2 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.

1.5 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 seed, mulch, tackifier, fertilizer, liquid soil amendments and micronutrients.

.3 Submit in writing 15 days prior to commencing work:

.1 Volume capacity of hydraulic seeder in litres.

.2 Amount of material to be used per tank based on volume.

.3 Number of tank loads required per hectare to apply specified slurry mixture per hectare.

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

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

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of Provincial Horticultural Trades Association.

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Turf Maintenance designation.

1.7 DELIVERY, STORAGE AND HANDLING

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

.2 Delivery and Acceptance Requirements:

.1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name and lot number.

.2 Inoculant containers to be tagged with expiry date.

.3 Storage and Handling Requirements:

.1 Store fertilizer off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

1.8 WARRANTY

.1 For seeding, 12 months warranty period is extended to 1 full growing season.

.2 Contractor hereby warrants that seeding will remain free of defects in accordance with General Conditions CCDC GC 12.3, but for 1 full growing season.

.3 End-of-warranty inspection will be conducted by the Ministerial Representative.

Part 2 Products

2.1 MATERIALS

.1 Seed: "Canada pedigreed grade" in accordance with Government of Canada Seeds Act and Regulations.

.1 Grass mixture: "Certified", "Canada No. 1 and 2 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".

.1 Legume mixture: "Certified", "Specialty Seed", "Canada No. 1 and 2" for ditch seeding (slope stabilization) with application rate of 230kg/ha.

.1 Mixture composition Herbio Stable +:

.1 50 % Creeping Red Fescue.

.2 50 % Canada meadow grass Ruebens,

.2 Mulch: specially manufactured for use in hydraulic seeding equipment, [non-toxic, water activated, green colouring], free of germination and growth inhibiting factors with following properties:

.1 Type I mulch:

.1 Made from wood cellulose fibre.

.2 Organic matter content: 95% plus or minus 0.5%.

.3 Value of pH: 6.0.

.4 Potential water absorption: 900%.

.2 Type II mulch:

.1 Made from newsprint, raw cotton fibre and straw, processed to produce fibre lengths of 15 mm minimum and 25 mm maximum. Greater proportions of ingredients to be straw.

.3 Tackifier: water dilutable, liquid dispersion or water soluble vegetable carbohydrate powder.

.4 Water: free of impurities that would inhibit germination and growth. The Contractor must supply water from a source located outside Forillon National Park limits.

.5 Fertilizer:

.1 To Canada "Fertilizers Act" and Regulations.

.2 Complete synthetic, slow release with 35% of nitrogen content in water-insoluble form.

.6 Inoculants: inoculant containers to be tagged with expiry date.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for hydraulic seeding in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of the Ministerial Representative.

.2 Inform the Ministerial 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 the Ministerial Representative.

3.2 INSTALLERS

.1 Use installers members in Good Standing of Horticultural Trades Association.

3.3 PROTECTION OF EXISTING CONDITIONS

.1 Protect structures, signs, guide rails, fences, plant material, utilities and other surfaces not intended for spray.

.2 Immediately remove any material sprayed where not intended as directed by the Ministerial Representative.

3.4 PREPARATION OF SURFACES

.1 Do not perform work under adverse field conditions such as wind speeds over 10 km/h, frozen ground or ground covered with snow, ice or standing water.

.2 Fine grade areas to be seeded free of humps and hollows.

.1 Ensure areas are free of deleterious and refuse materials.

.3 Cultivated areas identified as requiring cultivation to depth of 25 mm.

.4 Ensure areas to be seeded are moist to depth of 150 mm before seeding.

.5 Obtain Ministerial Representative's approval of grade and topsoil depth before starting to seed.

3.5 FERTILIZING PROGRAM

.1 Fertilize when seeding and a second time during the establishment period until final acceptance.

3.6 PREPARATION OF SLURRY

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to Ministerial Representative. Supply equipment required for this work.

.2 Charge required water into seeder. Add material into hydraulic seeder under agitation. Pulverize mulch and charge slowly into seeder.

.3 After materials are in seeder and well mixed, charge tackifier into seeder and mix thoroughly to complete slurry.

3.7 SLURRY APPLICATION

.1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

.2 Hydraulic seeding equipment:

.1 Slurry tank.

.2 Agitation system for slurry to be capable of operating during charging of tank and during seeding, consisting of recirculation of slurry and/or mechanical agitation method.

.3 Capable of seeding by 50 m hand operated hoses and appropriate nozzles.

.4 Tank volume to be certified by certifying authority and identified by authorities "Volume Certification Plate".

.3 Slurry mixture applied per hectare.

.1 Seed: upon application rate specified in "Materials" section.

.2 Mulch: Type II, 3 000 kg.

.3 Tackifier: 900 L or upon manufacturer's recommendations.

.4 Water: Minimum [30,000] L or upon manufacturer's recommendations.

.5 Fertilizer: 125 kg, ratio 1-3-1.

.4 Apply slurry uniformly, at optimum angle of application for adherence to surfaces and germination of seed.

.1 Using correct nozzle for application.

.2 Using hoses for surfaces difficult to reach and to control application.

.5 Blend application 300 mm into adjacent grass areas or sodded areas on previous applications to form uniform surfaces.

.6 Re-apply where application is not uniform.

.7 Remove slurry from items and areas not designated to be sprayed.

3.8 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.1 Clean and reinstate areas affected by Work.

.3 Waste Management: separate waste materials for reuse, recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Divert unused fertilizer from landfill to official hazardous material collections site approved by the Ministerial Representative.

3.9 PROTECTION

.1 Protect seeded areas from trespass until plants are established.

.2 Remove protection devices as directed by the Ministerial Representative.

3.10 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Ensure maintenance is curried out under supervision of certified Landscape Maintenance Supervisor.

.2 Perform following operations from time of seed application until acceptance by the Ministerial Representative.

.3 Legume Mixture:

.1 Repair minor dead and bare spots as determined by the Ministerial Representative to allow establishment of seed prior to acceptance.

.2 Repair major dead and bare spots as determined by the Ministerial Representative in accordance with site climatic averages and recommendations of local horticultural governmental representative.

3.11 ACCEPTANCE

.1 Seeded areas will be accepted by the Ministerial Representative provided that:

.1 Plants are uniformly established. Seeded areas are free of rutted, eroded, bare or dead spots.

.2 Areas have been mown at least [twice].

.3 Areas have been fertilized.

.2 Areas seeded in fall will achieve final acceptance in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.12 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:

.1 Repair and reseed dead or bare spots to satisfaction of the Ministerial Representative.

.2 Mow areas seeded upon the fertilization program established and as directed by the Ministerial Representative.

.3 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles and water in well.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 35 29.06 – Health and Safety Requirements

.3 Section 01 35 43 – Environmental Procedures.

.4 Section 01 61 00 – Common Product Requirements.

.5 Section 01 74 11 – Cleaning.

.6 Section 01 74 21 – Construction Waste Management and Disposal.

.7 Section 32 91 21 – Civil Topsoil and Earthwork.

1.2 REFERENCES

.1 Definitions:

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

.2 Reference Standards:

.1 Agriculture and Agri-Food Canada (AAFC).

.1 Plant Hardiness Zones in Canada-2000.

.2 Canadian Nursery Landscape Association (CNLA)

.1 Canadian Standards for Nursery Stock-2006.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)

.1 Material Safety Data Sheets (MSDS).

.4 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling: obtain approval from ministerial Representative 7 days in advance of shipment of plant material.

.2 Schedule to include:

.1 Quantity and type of plant material.

.2 Shipping dates.

.3 Arrival dates on site.

.4 Planting Dates.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for trees, shrubs, ground cover, fertilizer, mycorrhiza, anti-desiccant, anchoring equipment, and mulch and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements 01 35 43 - Environmental Procedures.

1.5 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: to be a Member in Good Standing of the Professional Landscape Quebec Association (PPQA).

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

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

.1 Protect plant material from frost, excessive heat, wind and sun during delivery.

.2 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.

.3 Storage and Handling Requirements:

.1 Immediately store and protect plant material which will not be installed within 1 hour in accordance with supplier's written recommendations and after arrival at site in storage location approved by the ministerial Representative.

.2 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.

.3 Store and manage hazardous materials in accordance with manufacturer's written instructions.

1.7 WARRANTY

.1 For trees and plant material over 50 mm caliper plant material as itemized on plant list the 12 months warranty period is extended to 24 months.

.2 Contractor hereby warrants that trees and plant material over 50 mm caliper will remain free of defects, but for 1 full growing season, providing adequate maintenance has been provided.

.3 End-of-warranty inspection will be conducted by the ministerial Representative.

.4 The ministerial Representative reserves the right to extend Contractor's warranty responsibilities for an additional one year if, at end of initial warranty period, leaf development and growth is not sufficient to ensure future survival.

Part 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 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 Tree species should be included in the lists below:

.1 Softwood: black spruce, white spruce, white pine or white cedar.

.2 Hardwood: White birch, yellow birch, sugar maple and red maple.

.3 Tree species should be chosen according to the site and approved by the ministerial Representative.

.4 Trees: with straight trunks, well and characteristically branched for species. Minimum dimensions should be around 30 mm diameter for proposed hardwoods and an average of 100 cm height for softwoods.

.5 Trees larger than 100 mm in caliper: half root pruned during each of two successive growing seasons, the latter at least one growing season before arrival on site.

.6 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

.7 Collected stock: maximum 40 mm in caliper, with well developed crowns and characteristically branched; no more than 40% of overall height may be free of branches.

.1 During collection, ensure 10% maximum seed crop (or plants) are collected from healthy population of many individuals, and from several plants of same species.

.2 Leave remainder for natural dispersal and as food for dependent organisms.

2.2 WATER

.1 Free of impurities that would inhibit plant growth.

2.3 STAKES

.1 T-bar, steel, 40 x 40 x 5 x 2440 mm or wood, pointed one end, 38 x 38 x 2300 mm upon ministerial Representative's instructions.

2.4 WIRE TIGHTENER

.1 Type 1: galvanized steel stamped plate or galvanized rod triangular shape.

.2 Type 2: turnbuckle, galvanized steel, 9.5 mm diameter with 270 mm open length.

2.5 GUYING WIRE

.1 Type 1: steel, 3 mm wire.

.2 Type 2: 1.5 mm diameter multi-wire steel cable.

.3 Type 3: 3 mm diameter multi-wire steel cable.

2.6 CLAMPS

.1 U-bolt: galvanized, 13 mm diameter, c/w curved retaining bar and hex nuts.

.2 Crimp type.

2.7 ANCHORS

.1 Wood:

.1 Type 1: 38 x 38 x 460 mm.

.2 Type 2: 38 x 67 x 600 mm.

.2 Drive-in type.

.1 Type 1: 13 mm diameter x 75 mm long, aluminum

.2 Type 2: 18 mm diameter x 120 mm long, aluminum.

.3 Screw-in type:

.1 100 mm diameter steel disc.

2.8 GUYING COLLAR

.1 Tube: plastic, 13 mm diameter, nylon reinforced.

2.9 TRUNK PROTECTION

.1 Wire mesh: galvanized, electrically welded 1.4 mm wire with 25 x 25 mm mesh and fastener.

.2 Plastic: perforated spiralled strip.

.3 Burlap: clean 2.5 kg/m^2 minimum mass and 150 mm minimum wide, and twine fastener.

.4 Tar impregnated crepe paper and twine fastener.

2.10 MULCH

.1 Bark chip: varying in size from 25 to 50 mm in diameter, from bark of coniferous trees.

.2 Wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves.

.3 Shredded wood: varying in size from 25 to 125 mm in length, from coniferous trees.

.4 Synthetic or inorganic mulch.

2.11 FERTILIZER

.1 Synthetic commercial type as recommended by soil test report and manufacturer.

.1 Ensure new root growth is in contact with mycorrhiza.

.2 Use mycorrhiza as recommended by manufacturer's written recommendations.

2.12 ANTI-DESICCANT

.1 Wax-like emulsion.

2.13 FLAGGING TAPE

.1 Fluorescent, with colour approved by the ministerial Representative.

2.14 SOURCE QUALITY CONTROL

.1 Obtain approval from ministerial Representative of plant material prior to planting.

.2 Imported plant material must be accompanied with necessary permits and import licenses. Conform to Federal, Provincial or Territorial regulations.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for planting installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of the ministerial Representative.

.2 Inform the ministerial 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 the ministerial Representative.

3.2 PRE-PLANTING PREPARATION

.1 Proceed only after receipt of written acceptability of plant material from the ministerial Representative.

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees in leaf in accordance with manufacturer's instructions.

.4 Locate and protect utility lines.

.5 Notify and acquire written acknowledgment from utility authorities before beginning excavation of planting pits for trees and shrubs.

.6 Temporary Erosion and Sedimentation Control:

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction and Ministerial Representative's approval.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.3 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 Establishment of sub-grade for planting beds in accordance with the ministerial Representative's instructions.

.2 Preparation of planting beds in accordance with Section 32 91 21 - Topsoil and Finish Earthwork.

.3 For individual planting holes:

.1 Stake out location and obtain approval from the ministerial Representative prior to excavating.

.2 Excavate to depth and width as indicated.

.3 Remove rocks, roots, debris and toxic material from excavated material that will be used as planting soil for trees and individual shrubs. Dispose of excess material.

.4 Scarify sides of planting hole.

.5 Remove water which enters excavations prior to planting. Notify the ministerial Representative if water source is ground water.

3.4 PLANTING

.1 For bare root stock, place 50 mm backfill soil in bottom of hole.

.1 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.

.1 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 Plant vertically in locations as indicated.

.1 Orient plant material to give best appearance in relation to structure, roads and walks.

.5 For trees and shrubs:

.1 Backfill soil in 150 mm lifts.

.1 Tamp each lift to eliminate air pockets.

.2 When two thirds of depth of planting pit has been backfilled, fill remaining space with water.

.3 After water has penetrated into soil, backfill to finish grade.

.2 Form watering saucer as indicated.

.6 For ground covers, backfill soil evenly to finish grade and tamp to eliminate air pockets.

.7 Water plant material thoroughly.

.8 After soil settlement has occurred, fill with soil to finish grade.

3.5 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as indicated.

.2 Install trunk protection before installation of tree supports.

3.6 TREE SUPPORTS

.1 Install tree supports as indicated.

.2 Use single stake tree support for deciduous trees less than 3 m in height and evergreens less than 2 m in height.

.1 Place stake on prevailing wind side and 150 mm minimum from trunk.

.2 Drive stake 150 mm minimum into undisturbed soil beneath roots.

.1 Ensure stake is secure, vertical and unsplit.

.3 Install 150 mm long guying collar 1500 mm above grade.

.4 Thread Type 1 guying wire through guying collar tube.

.1 Twist wire to form collar and secure firmly to stake. Cut off excess wire.

.3 Use 3 guy wires and anchors for deciduous trees greater than 3 m in height 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 multi-wraps 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 the ministerial Representative.

.9 Install flagging tape to guys as indicated.

.4 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.7 MULCHING

.1 Ensure soil settlement has been corrected prior to mulching.

.2 Spread mulch as indicated.

3.8 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting to acceptance by the ministerial Representative.

.1 Water to maintain soil moisture conditions for optimum establishment, growth and health of plant material without causing erosion.

.1 For evergreen plant material, water thoroughly in late fall prior to freeze-up to saturate soil around root system.

.2 Remove weeds monthly.

.3 Replace or respread damaged, missing or disturbed mulch.

.4 For non-mulched areas, cultivate as required to keep top layer of soil friable.

.5 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from the ministerial Representative prior to application.

.6 Remove dead or broken branches from plant material.

.7 Keep trunk protection and guy wires in proper repair and adjustment.

.8 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

3.9 MAINTENANCE DURING WARRANTY PERIOD

.1 From time of acceptance by the ministerial Representative to end of warranty period, perform following maintenance operations.

.1 Water to maintain soil moisture conditions for optimum growth and health of plant material without causing erosion.

.2 Reform damaged watering saucers.

.3 Remove weeds monthly.

.4 Replace or respread damaged, missing or disturbed mulch.

.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable.

.6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from the ministerial Representative prior to application.

.7 Apply fertilizer in early spring as indicated by soil test.

.8 Remove dead, broken or hazardous branches from plant material.

.9 Keep trunk protection and tree supports in proper repair and adjustment.

.10 Remove trunk protection, tree supports and level watering saucers at end of warranty period.

.11 Remove and replace dead plants and plants not in healthy growing condition. Make replacements in same manner as specified for original plantings.

.12 Submit monthly written reports to the ministerial Representative identifying:

.1 Maintenance work carried out.

.2 Development and condition of plant material.

.3 Preventative or corrective measures required which are outside Contractor's responsibility.

3.10 VERIFICATION

.1 Verification requirements in accordance with ministerial Representative approval include:

.1 Materials and resources.

.2 Storage and collection of recyclables.

.3 Construction waste management.

.4 Local/regional materials.

3.11 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.2 Divert discarded burlap, wire and plastic plant containers materials from landfill to plastic recycling facility approved by the ministerial Representative.

.3 Dispose of unused fertilizer at official hazardous material collection site approved by the ministerial Representative.

.4 Dispose of unused anti-desiccant at official hazardous material collections site approved by the ministerial Representative.

.5 Divert unused wood and mulch materials from landfill to recycling or composting facility approved by the ministerial Representative.

3.12 CLOSEOUT ACTIVITIES

.1 Submit maintenance reports for trees, shrubs, and other plantings.

END OF SECTION

PART 1 - GENERALITIES

1.1 RELATED SECTIONS

.1 Section 01 32 18 – Schedule Work Bar Chart (Gantt)

.2 Section 01 33 00 – Submittal Procedures

.3 Section 01 35 43 – Environmental Procedures

.4 Section 01 74 21 – Construction Waste Management and Disposal

.5 Section 31 23 11 – Excavation and Backfilling

.6 Section 32 91 21 – Civil Topsoil and Earthwork

.7 Section 32 92 19.16 – Hydraulic Seeding

.8 Section 33 31 01 – Culverts Rehabilitation

1.2 SCOPE OF WORK

.1 Provide all the manpower, equipment, tools, materials, transportation and other services required to carry out and complete all work described and specified in this section and Contract documents. The Work consists, but not limited to:

.1 Remove existing culverts;

.2 Provide and install new culverts;

.3 Provide and install concrete sloped end sections, cut-off walls and rip-rap at the new culverts ends.

1.3 REFERENCES

.1 Bureau de normalisation du Québec (BNQ) :

.1 BNQ 1809-300 (2004) R2007 – M1(2009): Construction Work – General technical clauses – Drinking water and sewer pipes;

.2 BNQ 2622-126: Reinforced Concrete and Unreinforced Concrete Pipes and Monolithic Lateral Connections for Evacuation of Domestic Wastewater and Storm Water;

.3 BNQ 2560-114 (2014): Aggregates.

.2 American Soxiety for Testing and Materials (ASTM)

.1 ASTM F894: Standard Specifications for Polyethylene (PE) Large Diameter Profile Wall Sewer and Drain Pipe, RSC 250

.3 Ministère des Transports du Québec (MTQ) :

.1 Tome II de la collection *Normes – Ouvrages Routiers* du MTQ : « Construction routière », chapitre 1 : « Terrassements »

.1 Standard drawing :

.1 II-1-021 – Tranchée transversale pour route existante

.2 Tome III de la collection *Normes – Ouvrages Routiers* du MTQ : « Ouvrages d'art », chapitre 4 : « Ponceaux »

.1 Standard drawings :

.1 III-4-002 – Installation des tuyaux de béton armé (TBA) et non armé (TBNA), assise en matériaux granulaires (réseau routier) - *Reinforced (RCP) and unreinforced (NCP) concrete pipe installation, granular beddind (road network)*;

.2 III-4-007A – Installation des tuyaux en polyéthylène haute densité (PEHD), assise en matériaux granulaires (réseau routier) – *High Density Polyethylene (HDPE) pipe installation, granular bedding (road network)*;

.3 III-4-007B – Installation des tuyaux en polyéthylène haute densité (PEHD), assise en matériaux granulaires (réseau routier) *(suite) - High Density Polyethylene (HDPE) pipe installation, granular bedding (road network) (complement)*;

.4 III-4-010 – Aménagement des extrémités biseautées, ponceaux circulaires de 1200 mm et moins de diamètre – *Sloped ends circular culverts layout, 1200 mm diameter and less*;

.5 III-4-011 – Pièce d'extrémité biseautée en béton – *Concrete sloped end section*

.6 III-4-014 – Mur parafouille en béton et revêtement de protection – *Concrete Cut-off wall and protection surface*

1.4 SAMPLES

.1 Present samples for testing purposes to the Parks Canada Agency (PCA) project manager at the latter's request, and at the Contractor's expense.

1.5 SHOP DRAWINGS

.1 Shop drawings are required but are not necessarily limited to the following :

.1 Culverts and accessories

.2 Concrete Sloped End Sections

.3 Cut-off walls

.4 Geotextile membranes

.2 When the manufacturer for precast concrete elements detain a certification delivered by the BNQ in accordance with the protocol BNQ 2622-951, the Contractor can present the certification and its appendix. The elements that are not covered by the certification must be presented in accordance with the article "Shop drawings and product data" of Section 01 33 00 – Submittal procedures.

.3 Work related to the shop drawings may only start after said drawings have been verified and approved by the PCA project manager.

.4 The Contractor shall present an exhaustive list of the materials to be used, including the name of the manufacturer and supplier.

.5 Within the limits of the Contract, all materials must be uniform, new and come from the same manufacturer.

1.6 CERTIFICATION OF MATERIALS

.1 At least 2 weeks prior to the start of the work, present the results of tests conducted by the manufacturer and the certificate attesting that the pipes comply with the requirements of this section.

.2 Ensure that pipes bear the certification stamp.

1.7 TRANSPORTATION, STORAGE AND HANDLING

.1 Deliver, store and handle materials in compliance with the manufacturer's instructions.

.2 Renting, layout and restoration works for stockpiling area are at the Contractor expense.

.3 The Contractor shall take the following precautions when handling pipes:

.1 The pipe shall be handled so as not to touch sharp objects;

.2 Avoid impact in lifting;

.3 Storage surfaces shall be leveled, flat and clean;

.4 Pipes shall not be dropped or allowed to knock against another pipe;

.5 Gaskets shall be protected from excessive exposure to heat, direct sunlight, oil and grease.

.4 All materials found to be damaged or in poor condition shall be rejected or replaced at the Contractor's expense.

1.8 WORK SCHEDULE

.1 Principal activities related to the work covered in this section must be presented in the work schedule according to the requirements of the Section 01 32 18 – Schedule Work Bar Chart (Gantt).

1.9 WORK BY OTHER COMPANIES OR CONTRACTORS

.1 If need be, the Contractor shall be required to coordinate his work with that of the Municipality or any other contractor or public utility, which may need to carry out work of any nature whatsoever, before or during the execution of work covered by this contract.

1.10 ALIGNMENT AND LEVELS

.1 The Contractor shall strictly respect the layout and proposed pipe's shown in the plans, as well as the class and diameter of pipes, the number, positions and elevations.

.2 The final location of an underground structure must not be more than 100 mm from that shown in the contract drawings. The final elevation of an underground structure must not be more than 25 mm from that indicated on these same drawings.

.3 In the event that obstructions interfere with work to the point of requiring changes, the Ministerial Representative can require that work be modified or displaced accordingly.

1.11 WASTE MANAGEMENT AND DISPOSAL

.1 Management and disposal of waste generated by the Work must comply with the Section 01 74 21 – Construction/Demolition Waste Management and Disposal Procedure.

1.12 WORKING METHOD

.1 The Contractor must submit written method of work for approval and the presentation of the method of work must be done a least 2 weeks before the start of the work and meet the requirements of PCA, and MDDEFP MNR. In addition, the Contractor method of work must comply with the Section 01 35 43 - Environmental Procedure, plus the following requirements:

.1 Isolate the work area to work dry.

.2 Ditch must recover their original profiles or to be layout according to the plans indications;

.3 The Contractor shall minimize the width of the work and equipment shall not be operated beyond the limits of the influence of the work.

.4 Revegetalizing slopes and all areas disturbed by the work without delay according to the requirements of Sections 32 91 21 –Topsoil and earthwork, and 32 92 19.16 –Hydraulic seeding.

.5 Take the necessary measures to prevent the transport of Warbler outsidee the already affected areas.

.2 In addition to the requirements the Section 01 35 43 – Environmental Procedures for works adjacent to waterways, the method of work to extend the proposed liner pipe for culvert #5 must meets the requirements of the Section 33 31 00 – Culverts Rehabilitation.

1.13 .1 REMOVAL OF CULVERTS

.1 Work related to the removal of existing culverts includes, but is not limited to, the supply of materials, equipments and labour required for the removal according to the requirements of the present and the plans indications. Plus the work includes:

.1 Saw cuts on the pavement, if required;

.2 The excavation, loading, transportation and disposal of excavation surplus and waste, complying with the requirements of the Section 31 23 11 –Excavation and backfilling;

.3 Temporary retaining works, if required;

.4 The dewatering of trenches and diversion of water in the culvert or in a designated location approved by the Ministerial Representative, according to the requirements of the Section 01 35 43 – Environmental procedures.

.5 The complete removal of existing culverts including waste material disposal in a site authorized by the MDDEFP;

.6 Backfilling up to the level of the infrastructure when culverts to be removed are not replaced. When the frost susceptibility of the material used for backfilling is different than the excavated material, the Contractor shall supply material and carry out cross slope according to the standard drawing II-1-021, with a "Cotation P" value of 2,25m.

1.14 INSTALLATION OF CULVERTS

.1 Work related to culverts consists in, but is not limited to, the supply of materials, equipment and manpower needed to carry out the installation of culverts complying with the requirements of, BNQ 1809-300 standard - Construction Work – General technical clauses – Drinking water and sewer pipes, the plans indications, and the requirements of this Section. Plus the work includes:

.1 The excavation, loading, transportation and disposal of excavation surplus and waste, complying with the requirements of the Section 31 23 11 –Excavation and Backfilling;

.2 Temporary retaining works if required;

.3 Pipes, cut-off walls and concrete sloped end sections;.

.4 Diversion, control of water and dewatering of trenches in accordance with requirements of the Section 01 35 43 - Environmental Procedures.

.5 The supply, placement and compaction of the bedding, the lateral fill and the protection cover, with granular material in accordance with the standard drawing III-4-002 or III-4-007A depending on the type of pipe.

.6 Accessories.

.7 The supply and placement of a clay plug or an unshrinkable fill plug when rock is expose on the bottom of a trench (culvert #6 station 1+170, etc.). The clay plug or the unshrinkable fill plug must have the following dimensions:

.1 Width equivalent of the trench width;

.2 Height equivalent of the elevation between the bottom of the trench and the half height elevation of the culvert, where the plug is carry out;

.3 One (1) metre long.

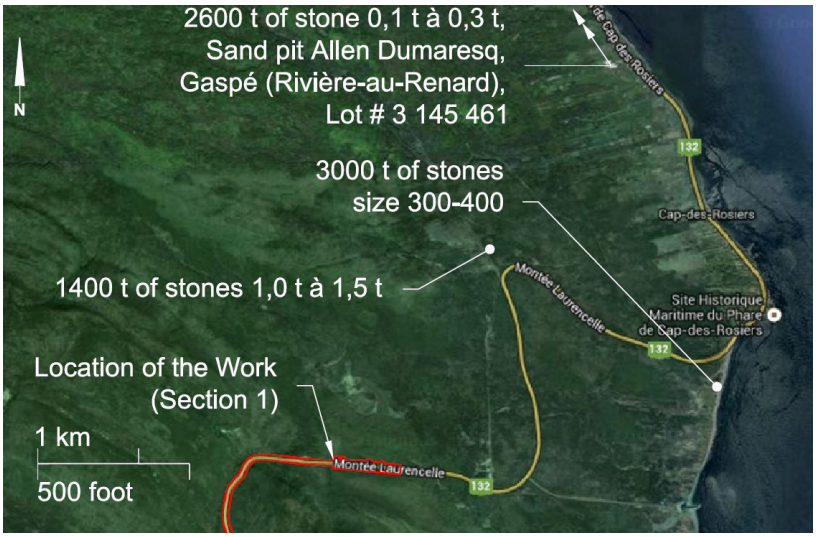
.8 Backfilling up to the infrastructure;

.9 The supply, placement and compaction of materials for cross slope in accordance with the standard drawing II-1-021, with a "Cotation P" value of 2,25m.

.10 Cut-off walls are not required when rock is exposed at the bottom of the trench.

1.15 RIP-RAP

.1 The stone used for rip-rap is supplied by the PCA to a maximum of the quantities indicated on the following stockpiling locations plan. The Contractor shall supply, manpower, equipment and transportation to the work site, where it is required according to the plans indications. The Contractor is responsible for the stone comminute if the plans or specifications required a different size than them available on stockpile site.



.2 The stone used for rip-rap must be washed before final placing to eliminate any discharge of sediments. Wash areas can be constructed on stockpiling site or on work site. In all case, wash plant must include measures to meet the requirements of the Section 01 35 43 – Environmental Procedures.

.3 Rip-rap works include, but is not limited to, transportation, loading, the material installation, the manpower, tool and all equipment to carry out the work in accordance with the plans indications. Plus the work includes:

.1 1st class excavations or 2nd class excavations and all preparation site works for rip-rap placing according to the plans or standard drawings indications;

2. The excavation, loading, transportation and disposal of excavation surplus and waste to a site complying with the requirements of the Section 31 23 11 –Excavation and Backfilling.

3. The supply and placement of rip-rap and geotextile membrane as specified on plans;

4. Stone comminute if required.

.4 The limits of rip-rap on the plans are approximate and should be adjusted according to the proposed slopes and natural slope of the land and according to the details indicated on the plans, or to the Ministerial Representative indications.

PART 2 - PRODUCTS

2.1 PIPES

.1 High Density Polyethylene Pipe (HDPE)

.1 HDPE pipe specified in this present contract concern the rehabilitation works of the culvert#5 and his extension to the new cast-in-place concrete headwalls.

.2 HDPE pipe must comply with the liner pipe specifications of the Section 33 31 01 – Culverts rehabilitation

.2 Reinforced concrete pipe (RCP)

.1 Reinforced concrete pipes: Class IV, unless otherwise indicated, complying with the requirements of the NQ 2622-126 for specified diameter, or as shown on plans.

.2 Joints shall have rubber gaskets complying with the requirements of the NQ 2622-126 or ASTM C443M standard.

.3 For each delivery, the Contractor shall provide the Ministerial Representative with an attestation of compliance. The attestation of compliance must contain the following information, for each production lot:

.1 The name of the pipes' manufacturer;

.2 The production date and place;

.3 The class, category and nominal dimensions;

.4 Results of analyses, tests and quality control measures required by the BNQ 2622-125 standard *"Tuyaux circulaires en béton armé et non armé – Guide de fabrication et de contrôle de la qualité en usine"* (Circular reinforced and non-reinforced concrete pipes — Guide to production and quality control in the plant);

.5 The production lot number.

.4 A production lot consists of pipes of the same class, category and dimension, which have been manufactured during a single ongoing production cycle under the same conditions.

2.2 ASPHALT MASTIC

.1 In these exceptional cases when it is used in the production of sewer pipe joints, asphalt mastic shall comply with the ASTM's C-14 and C-76 standards. It shall be cold formed, lend itself to trowel application, be freeze and water resistant, be unaffected by waste water, and harden over time while retaining its elasticity.

2.3 BEDDING AND SURROUND MATERIALS

.1 Bedding materials and cover materials shall comply with the standard drawings III-4-002 or III-4-007B indications, and the BNQ 2560-114 (2014) standard "Travaux de génie civil – Granulats".

2.4 BACKFILL MATERIALS

.1 Backfill materials shall comply with Section 31 23 11 - Excavation and Backfilling.

2.5 GEOTEXTILE MEMBRANE

.1 Geotextile membrane Type V that comply with the MTQ's standard 13101 - Géosynthétiques.

2.6 UNSHRINKABLE FILL

.1 The unshrinkable fill shall comply with article "Unshrinkable Fill" of section 31 23 11 - Excavation and Backfilling.

2.7 CONCRETE SLOPED END SECTION

.1 The concrete sloped end sections used at the culverts end must be reinforced and precast in accordance with the standard drawing III-4-011 specifications.

2.8 CUT-OFF WALL

.1 Cut-off walls are required and must meet the requirements of the standard drawing III-4-010.

2.9 RIP-RAP

.1 Rip-rap materials shall comply with the MTQ's standard 14501 - *Pierres d'enrochement et de revêtement de protection* (Rip-rap stone and protective covering) type and thickness as specified on plans.

.2 Rip-rap materials must be wash before placing to eliminate any discharge of sediments.

PART 3 - EXECUTION

3.1 PREPARATION WORK

.1 Clean and dry trenches prior to the pipe, cut-off wall and concrete sloped end section installation and remove all defective material from the site, to the Ministerial Representative satisfaction.

.2 Have pipes, cut-off walls and concrete sloped end section approved by the Ministerial Representative prior to their installation.

.3 The Contractor shall take all measures to control water inflow into the trench during construction and comply with the requirements of the Section 01 35 43 - Environmental Procedures.

.4 Temporary means to control erosion and sediments

.1 Establish temporary means of controlling erosion and sediment to prevent soil loss and to prevent accumulation carried by runoff or sediment and dust particles carried by

the wind, and, in accordance with the requirements of he section 01 35 43 – Environmental Procedures.

.2 Inspect control methods, maintain and repair until vegetalization are complete.

.3 Remove control methods, restore and stabilize areas disturbed during works.

3.2 DIGGING TRENCHES

.1 Dig trenches in compliance with Section 31 23 11 - Excavation and Backfilling

.2 Excavation of rock must be carrying out in accordance with the Section 31 23 11 – Excavation and Backfilling.

3.3 CULVERTS BEDDING

.1 Have the layout and depth of the trench approved by the Ministerial Representative before placing the bedding material.

.2 Bedding materials and cover materials installation must comply with the standard drawings III-4-002 or III-4-007B.

.4 Bedding surface should be straight without hollow or high points.

.5 Use bedding materials which are not frozen.

3.4 CULVERT AND CONCRETE SLOPED END SECTION INSTALLATION

.1 The bottom of the trench dug to accommodate the culverts and the concrete sloped end sections must follow the required profiles. The strength of the soil at the bottom of this trench shall be uniform and undisturbed.

.2 When the Ministerial Representative deems the soil at the bottom of the trench to be of poor quality, the Contractor shall remove this soil and replace it with the same material used for pipe bedding.

.3 The Contractor shall lay the culvert and concrete sloped end section according to the plans indications, starting with the downstream extremity. Contractor shall be really careful when installing cut-off walls in order to well compact the ground around the cut-off wall (minimum of 90% of the M.P.). Joints shall be perfectly sealed and secured. Backfilling shall be done on both sides at once.

.4 Each extremity of the culvert shall be fitted as the standard drawing III-4-010 specifications, unless otherwise indicated on plan.

3.5 REPAIRS

.1 All works to repair will be at the expense of the Contractor before the Ministerial Representative makes its recommendation of provisional acceptance.

END OF SECTION

PART 1 - GENERALITIES

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 35 43 – Environmental Procedures

.3 Section 01 45 00 – Quality Control

.4 Section 01 74 21 – Construction Waste Management and Disposal

.5 Section 03 30 00 – Cast-in-Place Concrete

1.2 SCOPE OF WORK

.1 Provide all the manpower, equipment, tools, materials, transportation and other services required to carry out and complete all work described and specified in this section and Contract documents. Not limited to, the works described and specified in this section consist to:

.1 Rehabilitate existing concrete box culverts by sliplining of a liner high density polyethylene pipe (HDPE) with smooth interior and exterior walls.

.2 Extend the sliplined culverts with a HDPE pipe to the new head walls.

1.3 REFERENCES

.1 Bureau de normalisation du Québec (BNQ) :

1.1 BNQ 1809-300/2004 (R 2007) : Construction work – General Technical Specifications – Drinking Water and Sewer Lines.

1.2 BNQ 3624-907 : Polyethylene (PE) Pipe and Fittings – Certification Protocol

.2 American Society for Testing and Materials (ASTM) :

1.3 ASTM F894-13 : Standard Specification for Polyethylene (PE) Large Diameter Profile Wall Sewer Drain Pipe.

1.4 ASTM D3350 : Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.

1.5 ASTM A370 : Standard test methods and definitions for mechanical testing of steel products.

1.6 ASTM A123/A123M : Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

1.7 ASTM A153/A153M : Standard Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware.

.3 American National Standards Institute (ANSI)/ American Water Works Association (AWWA) :

1.8 ANSI/AWWA C207 : Steel Pipe Flanges for Waterworks Service, Sizes 4 In. Through 144 In. (100 mm Through 3600 mm).

.4 Ministère des Transports du Québec (MTQ) :

1.9 Tome III « Ouvrages d'art » de la collection *Normes - Ouvrages Routiers* du MTQ : « Ouvrages d'art », dessins normalisés III-4-007A et III-4-007B;

1.10 Tome VII « Matériaux » de la collection *Normes - Ouvrages Routiers* du MTQ, norme 3101 « Bétons de masse volumique normale ».

1.4 SAMPLES

.1 Present samples in compliance with Section 01 33 00 - Submittal Procedures, or at the ministerial representative request, and at the Contractor's expense.

1.5 SHOP DRAWINGS

.1 Shop drawings are required but are not necessarily limited to the following :

.1 Detailed surveys of the existing culverts to rehabilitate;

.2 Pipe and accessories;

.3 Detailed works descriptions adapted to the existing site conditions;

.4 Measures to prevent pipe to float to the top of the host pipe during concrete placement;

.5 Work procedure for sliplining;

.6 Length of each pipe section;

.7 Joining methods and accessories;

.8 Concrete lifts sequences in order to eliminate the potential to generate a pressure that exceeds the allowable hydrostatic pressure of the pipe.

.2 Work related to the drawings may only start after said drawings have been approved by the ministerial representative.

.3 The Contractor shall present an exhaustive list of the materials to be used, including the name of the manufacturers and suppliers.

.4 Within the limits of the Contract, all materials must be uniform and come from the same manufacturer.

1.6 CERTIFICATION OF MATERIALS

.1 HDPE PIPES

.1 The polyethylene pipe manufacture must detain a certification delivered by the BNQ in accordance with the certification protocol BNQ 3624-907 "Polyethylene (PE) Pipe and Fittings – Certification Protocol.

.2 Ensure that pipes bear the certification stamp.

.2 CONCRETE

.1 The Contractor shall provide concrete formula in accordance with Section 03 30 00 – Cast-in-Place Concrete.

.3 METALIC PARTS AND ACCESSORIES

.1 For each delivered metal parts, Contractor shall provide:

.1 The name of the pipe manufacturer;

.2 The production date and place;

.3 The grade and nominal dimensions;

.4 The lift number;

.5 The mechanical's proprieties;

.6 The coat information;

.7 The production lot number.

1.7 TRANSPORTATION, STORAGE AND HANDLING

.1 Deliver, store and handle materials in compliance with the manufacturer's instructions.

.2 The Contractor shall take the following precautions when handling pipes to avoid damage and bending stress.

.3 All materials found to be damaged or in poor condition shall be rejected or replaced at the Contractor's expense.

1.8 ALIGNMENT AND LEVELS

.1 The Contractor shall adapt the proposed liner pipe alignment ant levels to match the existing concrete culverts alignment and profile.

1.9 WASTE MANAGEMENT AND DISPOSAL

.1 Waste management and disposal must comply with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.10 WORKING METHOD

.1 The Contractor must submit written method of work for approval. The presentation of the method of work must be done 1 week before the start of the work and meet the requirements of Parks Canada Agency (PCA), MDDEFP and MRN. In addition, the Contractor's method of work must meet the requirements of the Section 01 35 43 - Environmental Protection, plus the following principles:

.1 Isolate the work area to work dry.

.2 The Contractor shall exercise due diligence to minimize the duration of the work under water and on the banks.

.3 The bed of the stream must regain its original profile after work, unless otherwise indicated on plan.

.4 The Contractor shall minimize the width of the work and machinery shall not be operated beyond the clearing trees limits indicated on plan.

.5 The Contractor shall maintain a flow of the river downstream of the work area with a pumping system or a nozzle.

.6 Work streams to be performed during the period prescribed by Parks Canada, or when the river dried up completely.

.7 The Contractor shall provide devices to prevent small fish from getting into the pumping system.

.8 Provide devices limiting the release of sediment in the river, especially if there is pumping and when watering.

.9 Revegetalizing slopes and banks disturbed by the work without delay and to ensure effective recovery plant.

.10 Take the necessary measures to prevent the transport of Warbler outsidee the already affected areas.

PART 2 - PRODUCTS

2.1 PIPES

.1 High density polyethylene (HDPE) pipes must meet the following requirements:

.1 Nominal diameter : 1520 mm;

.2 Smooth exterior and interior wall;

.3 Class: RSC 250;

.4 Sealed joining:

.1 Threaded joints wrapped with a thermo shrinkable membrane having at least 300 mm width;

.2 Extrusion welded joints that can support a minimal internal pressure of 100 kPa;

.3 Flange joints for bends connections

.5 Pipe ends must be manufactured according to the joining method.

2.2 CONCRETE

.1 Materials use in concrete must comply with the specifications of Section 03 30 00 – Cast-in-Place Concrete.

.2 Concrete requirements for liner pipe bedding material, if required: Concrete type XII according to MTQ standards (norme 3101)

.3 Concrete requirements for filling the space between the liner pipe and the existing culvert:

.1 Concrete type XIV-C: Selfleveling concrete according to MTQ standards (norme 3101)

.2 Concrete type XV: Anti-washout concrete according to MTQ standards (norme 3101). This type of concrete should only be used if there is water infiltration inside the existing culvert and Contractor must obtain prior written approval from the ministerial representative.

2.3 FLANGE CONNECTIONS

.1 Flange joints must be used for all bends couplings. HDPE pipe must be manufactured with appropriate ends.

.2 A minimum separation distance of 3 meter is required between threaded or extrusion welded joints, and flange joints.

.3 Flange joints must meet the following requirements:

.1 Polyethylene ring;

.2 Galvanized steel flange connections;

.3 Bolting pattern shall comply with ANSI/AWWA C207, class B or D standard;

.4 Galvanized steel bolt, nut and washer shall comply with ASTM A307, class A standard;

.5 Flange connections must resist a minimal force of 115 kN;

.6 Galvanized steel shall comply with ASTM A123/A123M or ASTM 153/153M standard.

PART 3 - EXECUTION

3.1 PREPARATION WORK

.1 The Contractor shall construct temporary road to access to the work site. Temporary access road shall be constructed and maintain by the Contractor according to his construction equipment and his construction methods. The temporary access road must be constructed inside the tree clearing limits showed on plan. The Contractor can build, at his own expense, temporary retaining works.

.2 The Contractor shall excavate sump pit upstream to the work area, to catch and to redirect the normal flow of the watercourse.

.3 The Contractor shall maintain downstream a minimal flow equivalent to the normal watercourse flow.

.4 The Contractor shall erect temporary works to protect the work area from water damage resulting from stormwater events. All temporary works must comply with Section 01 35 43 – Environmental Procedures. The water flows considered for the culverts designs are listed in the following tables:

1.1 Culvert #5

Design storm (frequency of occurrence)	Flow
2 years	1,08 m³/s
25 years	2,29 m³/s

.5 The Contractor shall provide a temporary lighting system into the culverts to rehabilitate and provide a minimal lighting intensity of 125 lux.

.6 Clean and dry existing culverts to the Ministerial Representative satisfaction.

.7 Execute detailed surveys of the existing culverts to rehabilitate;

.8 The Contractor shall identify any obstruction and submit a detailed sketch of the existing conditions with the obstruction details. The Contractor shall provide the work method to remove the obstruction and indicated on the sketch all protection elements to secure the work. The sketch must bear stamp and signature of a qualified professional engineer licenced in Québec, registered to OIQ's roll.

.9 The Contractor shall verify and validate if obstruction can be removed. No claims will be considered in time schedule or in cost, if the work requires that the proposed liner pipe diameter have to be reduced.

.10 The Contractor shall obtain all the approval for the submittals related to the sliplining works before commencing any work, or ordering any materials.

.11 Temporary means to control erosion and sediments

.1 Establish temporary means of controlling erosion and sediment to prevent soil loss and to prevent accumulation on the properties and adjacent pedestrian walkways, carried by runoff or sediment and dust particles carried by the wind, in accordance with the Section 01 35 43 – Environmental Procedures.

.2 Inspect control methods to ensure cleaning until vegetalization are complete.

.3 Removal of fences and restore and stabilize areas stirred during works.

.12 Before sliplining works, Contractor can fill the space under the proposed liner pipe and the existing culverts invert with concrete type XII. Contractor shall prevent obstruction resulting from that operation.

3.2 TRENCHES DIGGING

.1 Trenches digging shall be performed in accordance to the Section 31 23 11 –Excavation and Backfilling.

.2 Rock excavation shall be performed by mechanical communition, unless if the Contractor obtains written authorization from Parks Canada Agency.

3.3 CULVERT SLIPLINING

.1 Work methods should be adapted to the pipe mechanical's properties.

.2 Work methods must follow manufacturer's recommendations and have been proven for similar projects.

.3 Work methods should prevent damage resulting from abrasion or contact with roc or culvert wall. In order to prevent damage to the liner pipe, it is recommended to use a rail system fixed to the existing culvert structure to execute pipe sliplining.

3.4 CONCRETE POURING

.1 The concrete pumping process must be performed in stage to eliminate the potential to generate a pressure that exceeds the allowable hydrostatic pressure of the pipe.

.2 Take measures to prevent trapped air.

.3 Ensure appropriate air circulation or fill the liner pipe with water to dissipate and prevent excessive heat potentially generated by hydration of the concrete.

.4 Work methods for concrete pouring must follow manufacturer's recommendation and have been proven for similar projects.

3.5 CULVERT AND ACCESSORIES INSTALLATIONS

.1 After culverts sliping and concrete filling works, the Contractor shall install bends at the end of the liner pipe and extend the HDPE pipe to the new concrete head walls according to the plans indications.

.2 HDPE pipe installation at the ends of the rehabilitated culverts must comply with the standard drawings III-4-007A and III-4-007B.

.3 Alignments and levels of culvert must be coordinated with new concrete headwalls construction.

.4 Take measures to eliminate the potential to generate a pressure that exceeds the allowable hydrostatic pressure of the pipe during headwalls concrete pouring.

.5 Joint between the pipe and the headwall must be watertight. This measure is required to prevent run-off in the annular space between the pipe and the headwall.

3.6 REPAIRS

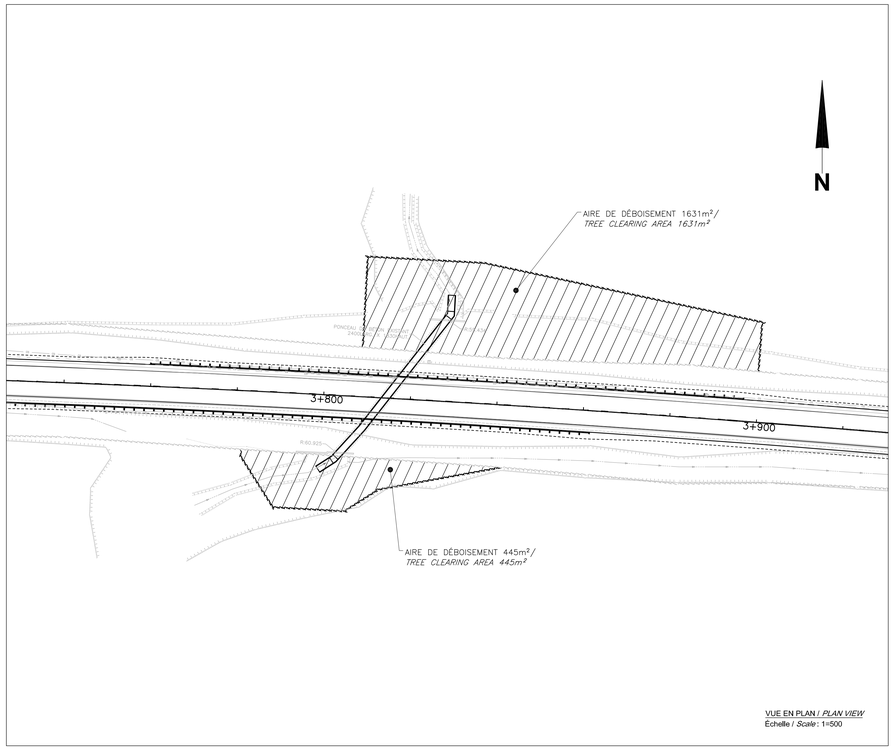
.1 All works to repair will be at the expense of the Contractor before the Ministerial Representative makes its recommendation of provisional acceptance.

.2 If major repairs must be made after the tests described in previous articles, the Ministerial Representative will require a television inspection on repaired places and this at the Contractor's expense

3.7 QUALITY CONTROL

.1 Quality control for cast-in-place concrete must comply with Section 01 45 00 – Quality Control and Section 03 33 00 – Cast-in-Place Concrete.

END OF SECTION



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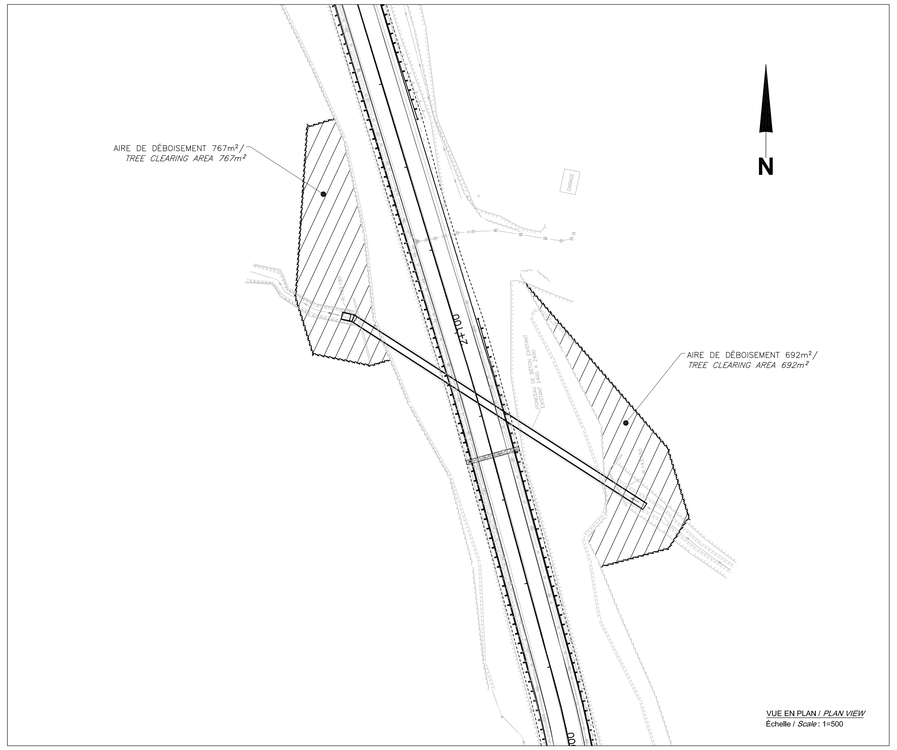
TREE CLEARING AREA 1 CULVERT #2



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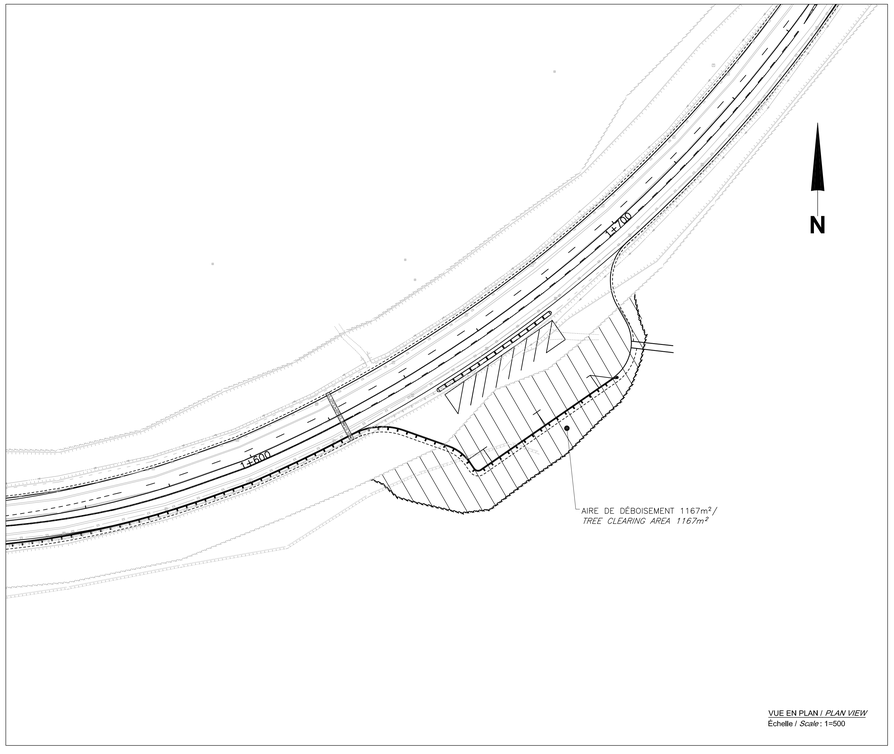
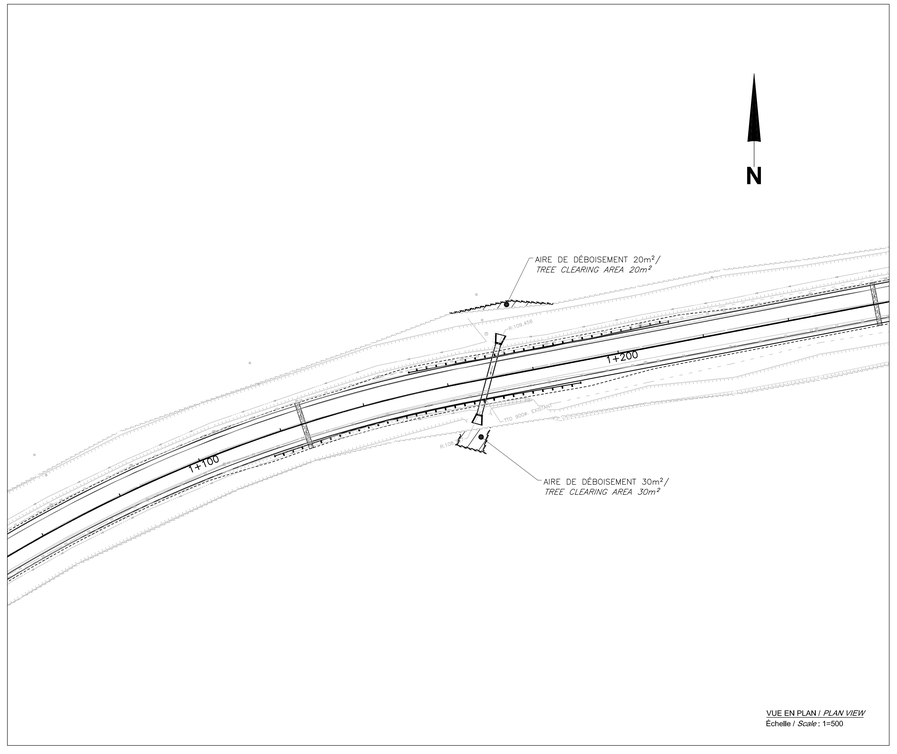
TREE CLEARING AREA 2 CULVERT #5



AIRE DE DÉBOISEMENT 3 STATIONNEMENT ''LES CRÊTES''
TREE CLEARING AREA 3 ''LES CRÊTES'' PARKING LOT



AIRE DE DÉBOISEMENT 4 PONCEAU #6
TREE CLEARING AREA 4 CULVERT #6

AutoCAD

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DESSAU

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LÉGENDE / LEGEND

ITEM	EXISTANT / EXISTING	PROJETÉ / PROJECTED
PLAN		
CONDUITE D'EGOUT SANITAIRE / SANITARY SEWER PIPE		
CONDUITE D'EGOUT PLUVIAL / STORM SEWER PIPE		
REGARD D'EGOUT / SEWER MANHOLE		
REGARD-PUISARD / MANHOLE-CATCH BASIN		
PUISARD / CATCH BASIN		
BOUCHON, RÉDUIT / PLUG, REDUCER		
CONDUITE D'HYDROEOC / WATERMAIN PIPE		
REGARD DE CHAMBRE ET VALVE / MANHOLE CHAMBER AND VALVE		
BOÎTIER ET VANNE / VALVE		
POTEAU D'INCENDIE / FIRE HYDRANT		
BOÎTE D'ENTRÉE DE SERVICE / SERVICE ENTRANCE BOX		
INTERFACE / INTERFACE		
BORDURE / CURB		
PAVAGE / PAVING		
ACCOTEMENT NON PAVÉ / ROADWAY SHOULDER		
FOSSÉ / DITCH		
PONCEAU / CULVERT		
TRAVERSE DE RUE / STREET CROSSING		
ARBRE, ARBUSTE / TREE , SHRUB		
HAIE / HEDGE		
CLÔTURE / FENCE		
GUIDERNE DE SÉCURITÉ / GUARDRAIL		
BÂTIMENT / BUILDING		
RAMPE POUR PERSONNES HANDICAPÉES / HANDICAP RAMP/WAY RAMP		
VOIE FERRÉE / RAILWAY		
LIGNE DE LOT / PROPERTY LINE		
LIGNE DE SERVITUDE / RIGHT OF WAY		
HAUT DE TALUS / TOP OF SLOPE		
BAS DE TALUS / BOTTOM OF SLOPE		
LIMITE DE BUSE / LIMIT OF ACCESS AREA		
B.ES., BORNE, STATION		
A ABANDONNER / TO ABANDON		
A ENLEVER / TO REMOVE		
FEUX DE CIRCULATION / TRAFFIC LIGHTS		
LAMPADAIRE SIMPLE / SINGLE STREET LAMP		
LAMPADAIRE DOUBLE / DOUBLE STREET LAMP		
LAMPADAIRE DÉCORATIF / DECORATIVE STREET LAMP		
POTEAU AVEC HAUBAN / POLE WITH GUY LINE		
POTEAU AVEC TRANSFORMATEUR / POLE WITH TRANSFORMER		
PYLÔNE / PYLON		
PUITS D'ACCÈS TÉLÉC, CÂBL, ÉLECT, GAZ / ACCESS MANHOLE TELEC, CABL, ELECT, GAS		
BOÎTE DE JONCTION / TERMINAL BOX		
RÉSEAU TÉLÉPHONIQUE AÉRIEN / AERIAL TELEPHONE NETWORK		
RÉSEAU ÉLECTRIQUE AÉRIEN / AERIAL ELECTRIC NETWORK		
RÉSEAU DISTRIBUTION AÉRIEN / AERIAL CABLE DISTRIBUTION		
RÉSEAU TÉLÉPHONIQUE SOUTERRAIN / UNDERGROUND TELEPHONE NETWORK		
RÉSEAU ÉLECTRIQUE SOUTERRAIN / UNDERGROUND ELECTRIC NETWORK		
RÉSEAU ÉCLAIRAGE SOUTERRAIN / UNDERGROUND LIGHTING NETWORK		
CÂBLODISTRIBUTION SOUTERRAIN / UNDERGROUND CABLE DISTRIBUTION		
MASSIF TÉLÉPHONIQUE / TELEPHONE DUCT BANKS	SIMILAIRE / SIMILISIMI	
MASSIF ÉLECTRIQUE / ELECTRIC DUCT BANKS	SIMILAIRE / SIMILISIMI	
CONDUITE DE GAZ / GAS PIPE		
VANNE DE GAZ / GAS VALVE		
BALISE DE REPÉRAGE / LOCATION BEACON		
FORAGE, PUITS / BORE HOLE, WELL		
FIBRE OPTIQUE / OPTICAL FIBER		
MILIEU HUMIDE / WETLANDS		
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C) APPELER AVANT DE CREUSER / CALL BEFORE DIGGING : **INFO-EXCAVATION : 1-800-663-9228**

SCEAUX / *SEALS*

révisions / revisions		date
0A	POUR COMMENTAIRES / FOR COMMENTS	2014-03-28

A no. du détail / *detail no.*
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Projet / *Project*

RÉFECTION MAJEURE DU TRONÇON 1
DE LA ROUTE 132 – PARC NATIONAL FORILLON

MAJOR REPAIR OF SECTION 1
OF THE ROAD 132 – FORILLON NATIONAL PARK

Dessin / *Drawing*

TRAVAUX DE DÉBOISEMENT
PARC NATIONAL FORILLON

FORILLON NATIONAL PARK
TREE CLEARING

Conçu par / *Designed by*	
François Laporte, ing.	2014-03-28 Date
Dessiné par / *Drawn by*	
Sonia Bertrand, tech.	2014-03-28 Date
Approuvé par / *Approved by*	
Daniel Aubin, ing.	2014-03-28 Date
Soumission / *Tender*	
— —	2014-XX-XX
Administrateur de projets APC / *PCA Project Manager*	
No de projet / *Project number*	No de contrat / *Contract number*
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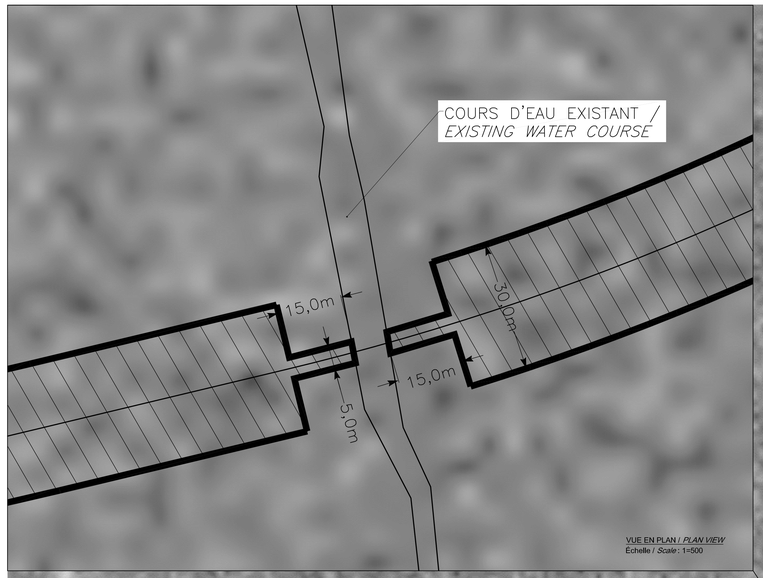

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Échelle / *Scale* : 1=500

VUE EN PLAN / *PLAN VIEW*
Échelle / *Scale* : 1=2000

Parcs Canada Parks Canada

DESSAU

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Dessin / *Drawing*

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