Appendices:

Drawings :

Architectural Landscaping :

AP-01 à AP-04

Structure (Bridge) :

B00 à B06

Traffic Maintenance, Pathway Detour and Earthwork :

B07 à B08

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

.1 The construction works executed within this contract are divided in six (6) parts as enumerated below. Without limit to it, a general description and summary of works to implement is shown for each part. Contractor shall refer to drawings, specifications and form of tender in relation with these parts during the preparation of the tender submission and during the execution of works. Work under this contract covers the following:

.1 Part 1 – General Requirements – This part groups all the general requirements of contract.

.2 Part 2 – Traffic maintenance, pathway detour and signage of works. Works for this part consists of works related to pedestrian pathway detour as to still maintain traffic on Fournier Boulevard.

.3 Part 3 – Bridge
Works for this part include the entire demolition of the deck and the partial demolition of piers for the existing bridge, as well, but limited to, from the installation of the piles to the fabrication and installation of the prefabricated bridge including reinforced soil retaining walls with geogrids and rip-rap (embankment protection).

.4 Part 4 – Management of soils
For this part, works include all works related for the excavation and transportation of contaminated soil so to eliminate them towards authorized sites.

.5 Part 5 – Landscape architecture
For this part, works include all works related to the installation of a belvedere on the side of the east approach.

.6 Part 6 - Civil works
For this part, works include all works for the grading and levelling, asphalting, as well as re-instatement of damaged areas (pathway foundations, sodding, etc.).

1.2 CODES

.1 Perform work in accordance with the contract specifications and the other federal, provincial and local codes, provided that in any case of conflict or discrepancy, the more stringent requirements shall apply.

.2 Meet or exceed requirements of:
.1 contract documents,
.2 specified standards, codes and referenced documents.

1.3 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each of following:
.1 Contract drawings
.2 Specifications
.3 Addenda
.4 Change orders
.5 Other modifications to Contract
.6 Field test reports
.7 Approved work schedule
.8 Manufacturers' installation and application instructions
.9 Approved traffic control plan

1.4 SITE CONDITIONS

.1 Soil investigation reports consist of following:
.1 Geotechnical Investigation Report - Rehabilitation of a Pedestrian Bridge of Leamy Creek (or Pedestrian Bridge over Leamy Lake Discharge), prepared by LVM, December 2013, Ref.: 237-B-0001957-1-GE-R-0002-01.
.2 Leamy Stream Pedestrian Bridge -

Complementary Geotechnical Study, prepared by LVM (Englobe), July 2015, N/Ref.: 033-B-0012112-1-GE-R-0001-00.

.3 Technical review following the issuance of the plans 99% - Geotechnical Comments, prepared by Englobe, December 2016, Ref.: 033-B-0012112-1-GE-R-0005-01.

.4 Phase II Environmental Site Assessment – Leamy Stream Pedestrian Bridge Gatineau (Hull Sector), Quebec, prepared by Englobe, January 2015, N/R. 033-B-0012112-2-HG-R-0001-00.

.5 Technical report following the emission of the plans 60% - Geotechnical Comments Revision 1, prepared by Englobe, October 6, 2015, N/Ref.: 033-B-0012112-1-GE-R-0002-01.

.2 The soil investigation reports are attached in appendix of the present specifications.

.3 The NCC and CIMA+ do not recognized any responsibility concerning the precision of the borehole information. This information shall not be in any manner be interpreted as a guaranty of soil conditions and shall be considered as approximate.

1.5 SITE VISIT

.1 Proponents desiring to offer a submission for the works shall visit the site and obtain themselves the information related to existing conditions which could modify the execution and completion of the works. The presentation of a submission will be considered as a proof that the bidder has conformed to this requirement. The subsequent claims, as an objective to get supplementary retribution, will not be acknowledged as components of work and material necessary to complete works

which should have been observed during the examination of site.

1.6 LIMITATION OF SITE ACCESS

.1 Contractor shall get familiar with the limitations of site access before bidding and shall establish how he will bring equipment and materials on site and shall determine the locations for temporary erection according the manutention, erection and phasing of works and this, without having recourse to tree cutting outside the permitted limits and without creating damage to adjacent vegetation.

1.7 CONDITIONS OF CONSTRUCTION SITE

.1 Dimensions of site and trees may differ from the ones shown on the drawings since drawings do not show the totality of trees and limit of forest is only schematic. Gather the information from site at Contractor’s cost and prepare the works based on these additional informations.

.2 The responsibility to gather the real conditions of site is the one of the Contractor.

1.8 PAYMENT

.1 Any minor or miscellaneous items indicated on the drawing as being part of the work of this Contract and for which there are no specific pay items listed on the unit price table must be included by the Contractor in his overhead and indirect charges and incorporated into the unit prices which are listed on the unit price tables.

.2 No separate payment will be made for work performed in respect to any of the specifications for which there is no specific pay item on the unit price table. The cost of these works must be

appropriated among, and included in, the unit prices bid for the pay items listed.

.3 Included in the unit prices bid for the respective items shall be, in addition to the actual cost of construction, all other items of work required to complete the Contract to the extent indicated on the drawings and specified herein.

.4 Evaluation in view of payment
.1 Provide to NCC Representative a notice sufficiently in advance of operations so to allow the required evaluation in view of payment.

1.9 CONTRACTOR'S USE OF SITE

.1 Contractor shall be responsible to install proper signage for users of roads, boaters (under bridge of creek) as for users of Voyageurs pathway which include pedestrians, cyclists and line skaters.
.1 Contractor shall install all protection measures so to protect the access road and pathway which allow access to construction site. Any damages resulting from the usage of these infrastructures by the Contractor shall be re-instated as per original conditions at his cost and to the satisfaction of the NCC Representative.

.2 Contractor shall delineate the storage areas with fences. The NCC is not responsible of vandalism and theft.
.1 The zones used for storage of works shall be maintained by the Contractor. Lawn, borders, trees, etc. when damaged by the use of zones by the Contractor shall be repaired and/or restored at his cost and to the satisfaction of the NCC Representative.

1.10 PROJECT MEETINGS

.1 NCC Representative will arrange project meetings and assume responsibility for setting times and recording and distributing minutes of meetings. Contractor must be present at all meetings.

1.11 SETTING OUT OF WORK

.1 The NCC Representative will not provide at the beginning of the project a survey of control points and coordinates of works to be implemented. The Contractor is responsible to establish them at its costs.

.2 The Contractor must install chaining stakes every 20 meters as well as indicate chaining and centerline’s projected rise. At every stage of work, the Contractor must install additional stakes giving the limit and elevations of works to be done.

.3 The Contractor shall assume full responsibility for and execution and completion of work at locations, lines and elevations indicated.

.4 The Contractor shall provide devices needed to lay out and construct work.

.5 The Contractor shall supply such devices as straight edges and templates required to facilitate NCC Representative's inspection of work.

.6 The Contractor shall supply stakes and other survey markers required for laying out work.

1.12 WORK SCHEDULE AND RESTRICTIONS

.1 Provide, within five (5) working days after Contract award, schedule of works in an acceptable format showing the dates for:

.1 environmental restrictions for the works;

.2 submission of shop drawings, list of materials and of samples;
.3 start and final completion of works for each sections of the estimate;
.4 final completion of works within the allocated period in the contractual documents;
.5 anticipated dates for each of the work including, but not limited to, the requirements in drawings and specifications.

.2 At the request of the NCC Representative, Contractor shall include to the schedule subsequent activities which may have been included in other works.

.3 Periodic examinations of the works' progress, as to the submitted calendar, will be carried out in accordance to the NCC Representative's decisions and the Contractor will update the calendar with the NCC Representative's assistance and approval.

.4 All works on site shall be completed by December 23rd 2016.

.5 No construction work is allowed under the natural high water line (NHWL) or into or over waterways from 1st of April to 15th of July due to environmental restrictions. However, exploratory excavation works behind the existing abutments to determine the location of their footing and piles can be done below the NHWL, but no contact or spill of these excavated water or materials is allowed with waterways and pumped water from excavation cannot be returned to waterways between 1st of April to 15th of July.

.6 Refer to Section 01 35 43 Environmental Protection.

1.13 PROTECTION OF NESTING OF MIGRATORY BIRDS

.1 Contractor shall not execute tree / vegetation cutting which could affect the active nesting of migratory birds. The usual period generally considered for the active nesting of migratory birds is from March 31st to September 1st. Thus tree / vegetation shall be cut before March 31st, preferably during the second last week of march or before, to insure no bird nesting in these trees.

.2 Contractor shall install nets under the bridge and around the lower part of the bridge railings during the second last week of march or before, to insure no bird nesting.

1.14 TAXES

.1 Pay all sales taxes levied according the law (including Federal, Provincial and Municipal taxes).

1.15 PERMITS AND BY-LAWS

.1 The Contractor shall make himself fully acquainted with all Provincial, Local and other By-laws relating to the work of this Contract, as he will be required to comply with such by-laws without extra compensation of any nature.

.2 Obtain and pay for permits, factory inspector’s approval, and other licenses required for this project and also pay any other charges incidental to such permits.

1.16 WEIGHING OF MATERIALS

.1 For the restrictions of works on the shorelines and waterways from April to mid-July.

.2 Unit Price Items, measured by the ton for payment purposes, must be accompanied by delivery tickets issued by the supplier

of the material, indicating what type of material and net weight in tons. Upon arrival on site, and before off loading, the loads must be approved, and delivery ticket signed by the Consultant on site. The Consultant will retain a duplicate copy of the signed ticket. The original ticket shall be retained by the Contractor for submission with invoices at the time of payment.

.3 Weights shown on the delivery ticket must be the net weight of the materials only as weighed on a scale, which is tested and approved by the weight inspectors of the Government of Canada at least once per year.

1.17 ADDENDAS

.1 Answers to questions directed to the Engineer, and any amendments to the drawings and specifications during the Tender period will be communicated in the Form of "Addenda" to all General Contractors tendering. Such "Addenda" shall be considered as and read as part of the specifications, and thereby included in the Contract Documents.

1.18 COORDINATION

.1 Coordinate operations of those involved in the work so that the work progresses effectively and efficiently.

.2 Ensure that sub-Contractors provide properly qualified superintendents on site to supervise trades involved in work. Do not permit change of personnel, except when approved.

.3 Ensure proper coordination with suppliers concerning the fabrication and delivery of the various elements to be put in place.

1.19 RECORD DRAWINGS AND SPECIFICATIONS

.1 As work progresses, maintain, accurate records to show deviations from contract documents.

.2 Just prior to the Consultant's inspection for issuance of final certificate of completion, supply one (1) set of white prints with all major and minor deviations neatly inked in red. The Consultant will provide two (2) sets of clean white prints for this purpose.

1.20 RELICS AND ANTIQUITIES PROTECTION

.1 Protect archaeological relics such as commemorative plates, artefacts and any other signs of old civilizations on the work site.

.2 Should discovery be made during work, suspend all activities, warn the NCC Representative's immediately and wait for his written directives before resuming work.

.3 Any discovery of an archaeological nature, old objects or other discoveries of scientific or historical interest are the property of the National Capital Commission (NCC).

1.21 DAMAGES

.1 Existing plant material, landscaping, roadways, pathways, structures, finishes and public utilities damaged during the execution of the work of this Contract, will be restored to their original condition, replaced, or full compensation made to affected parties by the Contractor.

.2 It is understood that restored or replaced work includes labour, equipment and material costs.

1.22 BILINGUAL DOCUMENTS

.1 This contract's drawings and specifications are written in both

official languages, in French and in English. Should there be any differences between the two versions, the version representing the project's spirit will be used. Note that in case of conflicts, contradictions or divergences, the most stringent requirements shall be applied.

1.23 PROJECT SIGNBOARD

.1 No project signboard is required for this project.

1.24 WORK PROTECTION

.1 No Protect finished work against damage until take-over.

.2 Protect adjacent work against the spread of dust and dirt beyond the work areas.

.3 Protect public from all hazards.

1.25 GUARANTEES AND WARRANTIES

.1 Before completion of work collect all manufacturer's guarantees and warranties and deposit with Consultant.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1	00 00 00	Specifications
.2	00 01 10	Table of Contents
.3	00 21 13	General Instructions
.4	01 11 00	Summary of Works
.5	00 33 00	Submittal Procedures
.6	01 35 00.06	Maintaining of Traffic and Pathway Access
.7	01 35 13.43	Special Project Procedures for Contaminated Sites
.8	01 35 30	Health and Safety Requirements
.9	01 35 43	Environmental Protection
.10	01 45 00	Quality Control
.11	01 52 00	Construction Facilities
.12	01 56 00	Temporary Barriers and Enclosures
.13	01 61 00	Common Product Requirements
.14	01 72 00	Project Record Documents
.15	01 74 11	Cleaning
.16	01 74 21	Construction and Demolition Waste Management and Disposal
.17	01 77 00	Closeout Procedures
.18	01 78 00	Closeout Submittals
.19	02 41 13.14	Asphalt Removal
.20	02 41 16	Structure Demolition
.21	02 61 00.01	Soil Remediation
.22	03 10 00	Concrete Forming and Accessories
.23	03 20 00	Concrete Reinforcing
.24	03 30 00	Cast-in-place Concrete
.25	04 03 07	Masonry Repointing
.26	04 05 00	Common Work Results for Masonry
.27	04 05 12	Masonry Mortar and Grout
.28	05 12 33	Structural Steel for Bridges
.29	13 34 30	Prefabricated Steel Bridge
.30	31 05 10	Corrected Maximum Dry Density for Fill
.31	31 05 16	Aggregates Materials
.32	31 09 16.28	Pile Tests
.33	31 11 00	Clearing and Grubbing
.34	31 23 33.01	Excavating, Trenching and Backfilling
.35	31 32 19.01	Geotextiles
.36	31 61 13	Pile Foundations, General Requirements
.37	31 62 16.16	Steel H Piles
.38	32 01 90.33	Tree and Shrub Preservation
.39	32 11 23	Aggregate Base Courses
.40	32 12 16	Asphalt Paving
.41	32 14 13	Precast Concrete Unit Paving
.42	32 17 23	Pavement Markings
.43	32 31 13	Fences and Gates
.44	32 32 34	Reinforced Soil Retaining Wall
.45	32 37 00	Exterior Site Furnishings

.46	32 91 19.13	Topsoil Placement and Grading
.47	32 92 19.6	Hydraulic Seeding
.48	32 93 10	Trees, Shrub and Ground Cover Planting
.49	32 93 43.01	Tree Pruning
.50	35 20 22	Dewatering and Cofferdams
.51	35 30 10	Elimination of Non-Official Trails
.52	35 31 19	Rip-Rap Protection
.53	35 49 25	Turbidity Curtains

Appendices:

.54	Geotechnical Investigation Report – Rehabilitation of a Pedestrian Bridge of Leamy Creek (or Pedestrian Brdige over Leamy Lake Discharge
.55	Leamy Stream Pedestrian Bridge - Complementary Geotechnical Study
.56	Technical review folllowing the issuance of the plans at 99% - Geotechnical Comments
.57	Phase II Environmental Site Assessment – Leamy Sream Pedestrian Bridge Gatineau (Hull Sector), Quebec
.58	Technical report folllowing the emission of the plans 60% - Geotechnical Comments Revision 1

1.2 INFORMATION TO TENDERS

.1 This section describes the general scope of work. All work to be governed by the latest edition of CAN/CSA S6-14.

.2 The provided scope of work is general in nature and under no circumstances shall be construed as exhaustive.

1.3 PAY ITEMS

.1 Each Item of Work shall include all incidental work such as, but not limited to:

- .1 Dust and fume control.
- .2 Protection of facilities to remain.
- .3 Protection of utilities and equipment.
- .4 Reinstatement of any disturbed element of structure or equipment affected by Contractor's operation.
- .5 Access to work area, platforms and scaffolding.
- .6 Costs of all applicable submissions and permits.
- .7 All costs associated with compliance to noise and vibration restrictions.
- .8 All costs associated with staging where such is required.
- .9 All costs of testing.
- .10 All costs associated with disposal of all removed materials in a safe environmental manner and in full compliance with applicable Federal, Provincial and Municipal legislations and statutes.
- .11 All costs associated with certifying parts of work, as required in Contract Documents.
- .12 All costs of concrete sawcutting.

.13 All costs of protection from falling debris.
.14 All measures required to assure safe closure of pathway to protect vehicles, users pedestrians, boaters, and bicycles at all times.
.15 Costs of all surveys.
.16 Cost of all submissions.
.17 All costs of SITEWORK:
  .1 Construct construction depot. Reinstate all grassed areas and other affected areas to original or better condition.
  .2 Protect all existing utilities.
  .3 Protect all existing signage.
  .4 All bonds, administration and supervisory costs.
  .5 Mobilization and demobilization.
  .6 Schedules and forecast cash flows.
  .7 Site preparation for work.
  .8 Costs of all necessary approvals and permits as applicable.
  .9 Cost of construction depot in location acceptable to NCC Representative.
  .10 All costs associated with locates, protection or temporary relocation and reinstallation of utilities, if applicable.
  .11 Installation of temporary barricades, hoarding, fencing and other protection required.
  .12 Cost of supplying and maintenance of adequate sanitary facilities.
  .13 Costs of certification of certain parts of work.
  .14 Costs associated with access to private properties as required and obtaining written release from the affected property Owner. Copy to be submitted to NCC Representative.
  .15 Maintaining and reinstatement of existing road signs, etc.
  .16 All cost of any incidental work not specifically mentioned in Contract Documents, but required due to virtue of work and/or Contractor methods..
  .17 All costs associated with environmental protection measures, except the one cost of which is explicitly specified to include in other Items of work.
  .18 Costs for installing, maintaining and removal of sediment control measures.
  .19 Any temporary lighting required to carry out work.
  .20 Protection of vehicles and public, when and where affected by Contractor’s operation, methods or works.
  .21 Any heating device or heating equipment required for the works.
  .22 Contractor is responsible to provide all labour, equipment and materials necessary to properly complete the work for all items.

1.4 INDEX AND REFERENCE NUMBERS

.1 All index and reference numbers, either in the Tender Form, plans, specifications, etc., where provided are given for the convenience of the Contractor and as such must be taken only as a general guide to the part of work referred to. It must not be assumed that such numbering is the only reference to each item, but the plans and specifications, as a whole must be fully read in detail.

1.5 INDIVIDUAL DESCRIPTION OF WORK

.1 The scope of work is provided for convenience of bidder and is for general information only and shall not be construed as exhaustive. Any particular description of work shall be read together with Contract Drawings. In case of discrepancy between specifications and drawings, Tenderer shall assume that a more expensive option will be employed. Any work, which is shown on the Contract Drawings, but is not necessarily separately listed, mentioned or described in written provisions of the Contract or vice versa is deemed to be included in both.

1.6 SCHEDULE OF ITEMS AND PRICES

.1 The quantities shown in the Schedule of Items and Prices, are for the sole purpose of indicating to the Tenderer the general magnitude of the work. For any work done on a unit price basis, the Contractor will be paid for an actual measured quantity at the unit price submitted in the Tender, subject to the provisions of the General Conditions. Any quantity shall first be approved by the NCC Representative prior to the Contractor do the works. If the Contractor from its own, decide to realize work without the NCC Representative approval, this part of the work will not be paid.

1.7 MEASUREMENT FOR PAYMENT

.1 The measurement for payment for each measurable and identified Item of Work, in Form of Tender, shall be as identified in the Form of Tender Table.

1.8 PRIX DU CONTRAT

.1 The Contract price shall include sufficient allowance for expenses associated with all probable and unforeseen site conditions related to work. No payment shall be made for claims based on site conditions varying from the conditions assumed by the Contractor during tendering.

1.9 SCHEDULE OF WORKS

.1 The Contractor shall submit a detailed Work Schedule and, if requested, a Projected Monthly Cash Flow Forecast to NCC Representative at Pre-Construction Meeting.

.2 The Detailed Work Schedule shall be in bar chart form indicating the following items against a weekly time scale:
- .1 Activities forming the critical path of the Schedule.
- .2 Dates and time periods of all major construction activities.
- .3 Dates of critical activities (long delivery items, changes of traffic shifts, protection measures, etc.).
- .4 Dates of important milestones.

1.10 PROJECTED MONTHLY CASH FLOW FORECAST

.1 The Projected Monthly Cash Flow Forecast shall indicate the projected cost of the work to be completed in each calendar month of the Contract term, and shall be based on the Contract prices and be consistent with the Detailed Work Schedule.

1.11 PRECISIONS FOR CONSTRUCTION SITE ORGANIZATION

.1 The Contractor is advised that no additional payment will be made for any repeated mobilization and demobilization for any of the construction activities covered by this Contract, interrupted by weather, or by any other construction activity included in any part of this Contract. No payments will be made under this Item to the Contractor until actual work commences.

PART 2 – SUMMARY OF WORKS

GENERAL ITEMS

2.1 PAY ITEM 1 - ORGANIZATION OF CONSTRUCTION SITE

.1 The work includes all site preparation and mobilization / demobilization. It includes site cleanup during and at the end of contract, as well as site re-instatement and the removal. Site re-instatement to its original condition shall be made for all construction / work areas including, but not limited to, damaged areas to the bridge, storage areas and access leading to the work areas. Organization of site includes, but not limited to, notably, the snowplowing of site and its accesses, as well as the hydraulic seeding of damaged et/or modified zones so to re-instate site to its original condition for the sectors specifically stipulated in the others pay items of Form of Tender (except at belvedere under a

separate item). Work includes the installation of temporary installations not mentioned specifically in the Form of Tender, the supply and installation of the protection fences protecting construction site as well as all others works explicitly or implicitly required and not defined in the specifications and drawings. This item also includes an adequate space dedicated for site construction meetings in a trailer located on site, as well as a table for examination of drawings and toilet.
It also includes the coordination with the work of Gazifère (Enbridge) who replaces an existing gaz conduit crossing the discharge along the south of nearby bridge of Fournier Boulevard during ten (10) weeks starting at the beginning of June 2016 (contact Skander Souissi or Germain Cheff tel. 819-776-8860). Plan for the closure of east job site access road during 2 to 3 days for the passage of Gazifère conduit installed by directional drilling. It also includes the coordination with the work of Hydro-Québec who is relocating an existing aerial cable crossing the discharge along the south of nearby bridge of Fournier Boulevard. Work includes a space dedicated for site construction meetings in a trailer, as well as a table for examination of drawings.

.2 Work of this item is primarily described on drawings and in Sections 00 21 13, 01 33 00, 01 35 29.06, 01 35 29.14, 01 52 00, 01 56 00, 01 61 00, 01 74 11, 01 74 21 and 01 77 00.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form. Site organization will be paid to prorate of estimate of completed works. However, a minimum of 25 % is paid at the first estimate.

.4 No measurement for payment will be made for this item.

2.2 PAY ITEM 2 – TRAFFIC CONTROL AND MAINTENANCE

.1 The item for the traffic control and maintenance includes all costs related to the following for the waterway, pathway detour and access to construction site:

- .1 Preparation of the traffic management plan.
- .2 Preparation of plans for detailed signage for each type of works.
- .3 Supply, installation, maintenance, displacement related to phases of works and removal of speed limit signs, if required.
- .4 Supply, installation, maintenance, displacement and dismantling of all traffic management devices (visual mark, standard panel/sign, barricade, site traffic light, etc.) for the overall works in compliance to the bylaws and standards in force and the contract requirements.
- .5 Mark out all the work areas with the help of visual marks/beacons.
- .6 Labour necessary to execute modifications to temporary signage during works (changes of configurations).
- .7 Masking and unmasking of traffic signs for the works affected by the daily changes of configurations.
- .8 Masking and unmasking, according the method approved by the NCC Representative (non-destructive), of permanent signs which are in conflict with the temporary signage (ex. : speed limit).
- .9 Flagpersons 24 h/24 h, if required, and of the lighting required to make them visible at night, as well as the operating costs used for the secure accesses to construction site.

.10 Supply, installation, maintenance, displacement and dismantling of identification signs for the site entrances or work areas.
.11 Expenses related to signage foremen and for interventions in the lanes and all other incidental expenses (ex. Request for closure).
.12 It also includes the coordination of work and traffic with Gazifère (Enbridge) who replaces an existing gaz conduit along the south of nearby bridge of Fournier Boulevard during ten (10) weeks starting at the beginning of June 2016 (contact Sketer Souissi or Germain Cheff tel. 819-776-8860). Also the coordination of work and traffic with Hydro-Québec who is relocating an existing aerial cable along the south of nearby bridge of Fournier Boulevard. Hydro-Quebec and Gazifère will use the same entrances to construction site of the present contract as shown in the drawings.
.13 Provide and install one large 2.5 m x 3.5 m advance sign indicating that most easterly northbound lane will be closed from beginning of June 2016 to end of December 2016 for pathway detour. Sign shall be installed three (3) weeks prior road lane disruption starts so to install closure and pathway detour devices.

.2 Works of this item are primarily described on drawings and in Section 01 35 00.06.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item. The amount is paid as follows:
.1 at 20 % following the initial installation
.2 at 60 % at prorata of work advancement
.3 at 20 % following the final dismantling of the work signage

2.3 PAY ITEM 3 – TEMPORARY ACCESS ROAD, INCLUDING SITE RE-INSTATEMENT

.1 This item for temporary access road includes all the costs related to the following:
.1 Construction of the new section of access road, including earthworks, excavation, granular base, drainage and culvert required.
.2 Changes, if required, of existing access roads to make them safe and passable for machinery.
.3 Maintenance of access throughout the works.

.4 The dismantling of temporary facilities and the site re-instatement as per before work.

.2 Works of this item are primarily described on drawings and in Section 01 35 00.06.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item. The amount is paid as

follows:
.1 at 40 % following the initial installation
.2 at 20 % at prorata of work advancement
.3 at 40 % following the dismantling of the temporary access and re-instatement of site

2.4 PAY ITEM 4 - TEMPORARY PATHWAY, INCLUDING SITE RE-INSTATEMENT

.1 This item for temporary pathway includes all costs related to:
.1 The construction of new section of temporary pathway, including earthworks, excavation, granular base, asphalt, required drainage and culvert.
.2 Establishing adequate physical separation on the Fournier Boulevard bridge, between the road lane and the pathway and as well between the pathway and the creek.
.3 Pathway maintenance throughout the construction works to ensure the safety of users.
.4 The dismantling of temporary facilities and re-instatement of such sites as before the work.

.2 Works of this item are primarily described on drawings and in Section 01 35 00.06.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item. The amount is paid as follows:
.1 at 40 % following the initial installation
.2 at 20 % at prorata of work advancement
.3 at 40 % following the dismantling of the temporary pathway and re-instatement of site

2.5 PAY ITEM 5 - MESSAGE PANELS NON STANDARD (INSTALLATION AND DISMANTLING)

.1 The bid price for this item entitled "Supply, installation and removal of special panels" made of plywood or aluminum panel is paid per square meter and includes the fabrication of road signs, equipment necessary for the assembly of separate parts of the same panel and the material necessary for its installation, regardless of the type of installation.

.2 Works of this item are primarily described on drawings and in Section 01 35 00.06.

.3 This item is paid in square meter (m^2) at the price included in the Tender Form.

.4 Measurements shall be done in function of the dimensions of each of the panels pre-established by shop drawings. Each panel shall be paid:

.1 at 80 % following a compliant installation
.2 at 20 % following its removal from site

2.6 PAY ITEM 6 - ENVIRONMENTAL PROTECTION MEASURES

.1 The price of this item covers the coordination, supply and installation of the environmental protection measures as stipulated in the contract and any other work explicitly or implicitly required and is not defined in the specifications and drawings before, during and termination of the contract.

.2 Work of this item is primarily described in Sections 01 33 00, 01 35 30, 01 35 43, 01 45 00, 01 61 00 and 01 74 11.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form. This item will be paid to the prorata of the estimate of work completed. However, a minimum of 25 % will be paid at the first estimation.

.4 No measurement for payment will be made for this item.

CONTAMINATED SOIL MANAGEMENT (PAY ITEMS 7 À 9)

2.7 PAY ITEM 7 - LOADING, TRANSPORT AND ELIMINATION - AB SOILS IN AUTHORIZED SITE

.1 The unit price covers the cost of transportation, weighing and disposal of contaminated AB soils to a receptor site authorized by the MDDELCC and all related required works that is not specifically mentioned in the specifications but necessary to carry out the work.

.2 Work of this item is primarily described in Sections 01 74 21 and report titled ‘’Phase II Environment Site Assessment’’ by Englobe in Appendix to the present Sections.

.3 The measurement for this item "Loading, transportation and disposal of AB soil at an authorized site" of the price schedule is done per metric ton, according the weight scale tickets provided from an approved scale and at the price included in the Tender Form.

.4 Only non re-usable A-B soils shall be disposed off-site.

2.8 PAY ITEM 8 - LOADING, TRANSPORT AND ELIMINATION - BC SOILS IN AUTHORIZED SITE

.1 The unit price covers the cost of transportation, weighing and disposal of contaminated BC soils to a receptor site authorized by the MDDELCC and all

related required works that is not specifically mentioned in the specifications but necessary to carry out the work.

.2 Work of this item is primarily described in Sections 01 74 21 and report titled ‘’Phase II Environment Site Assessment’’ by Englobe in Appendix to the present Sections.

.3 The measurement for this item "Loading, transportation and disposal of BC soil at an authorized site" of the price schedule is done per metric ton, according the weight scale tickets provided from an approved scale and at the price included in the Tender Form.

.4 Only non re-usable B-C soils shall be disposed off-site.

2.9 PAY ITEM 9 - LOADING, TRANSPORT AND ELIMINATION - SOILS > C IN AUTHORIZED SITE

.1 The unit price covers the cost of transportation, weighing and disposal of of contaminated > C soils to a receptor site authorized by the MDDELCC and all related required works that is not specifically mentioned in the specifications but necessary to carry out the work.

.2 Work of this item is primarily described in Sections 01 74 21 and report titled ‘’Phase II Environment Site Assessment’’ by Englobe in Appendix to the present Sections.

.3 Measurements in regards of this item "Loading, transportation and disposal of soil > C at an authorized site" in the Form of Tender shall be in metric ton, according the weight scale tickets provided from an approved scale and at the price included in the Tender Form.

DEMOLITION - EXISTING BRIDGE (PAY ITEMS 10 À 17)

2.10 PAY ITEM 10 – EXPLORATORY EXCAVATION AT ABUTMENTS

.1 The price of this item includes all activities related to the exploratory excavation works behind the existing abutments nos. 1 and 5 to determine the location of their footing and their piles so to confirm the location of adjacent new piles to install and the length of the new bridge to build as shown on drawings.

Drawing no. B-02 of existing is not an as-built drawing and is a schematic illustration of the existing infrastructure. Thus these exploratory excavation works shall be done as early as possible after contract award. They can be done below the NHWL, but no contact or spill of these excavated water or materials is allowed with waterways and pumped water from excavation cannot be returned to waterways between 1st of April to 15th of July due to environmental restrictions. Include also backfilling including, but not limited to, the supply of materials, backfilling of excavations, disposal, transportation, the implementation and any incidental expenses.

.2 Work for this item is mainly function of Contractor's methodology and is primarily described on drawings and in Sections 01 33 00, 01 45 00, 01 56 00, 31 05 16 et 31 23 33.01

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.11 PAY ITEM 11 - ENTIRE DEMOLITION – SUPERSTRUCTURE AND EXISTING STRUCTURES

.1 This item includes the demolition and removal of all components of the existing deck, including bridge concrete deck, its steel structure, railings, drainage system, approaches railings, all hardware and other adjacent existing works adjacent to the bridge including, but not limited to, the existing stone rip-rap. Part of the existing guardrail must be preserved to be installed in the new belvedere under a separate item. The item includes also the production of documents; shop drawings, procedures, slips. The Contractor shall take necessary measures to prevent any dispersion of materials in the streams and no debris should fall into waterways and shores. A demolition schedule should be submitted at least seven (7) days prior to any demolition work. It must be approved by the NCC Representative before performing any work. All debris must be transported off-site by the Contractor to the appropriate recycling sites for recyclable scrap (steel beams, for example) and for non-recyclable debris at appropriate landfills, all approved by the NCC Representative.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 35 29.06, 01 74 21 and 02 41 16. Contractor shall also conserve and preserve part of the existing bridge railing and an existing drain cap described in drawings and in Sections of the landscaping architecture for the belvedere.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.12 PAY ITEM 12 - SHORELINE ACCESS, CREEK ACCESS, BARGES, SEQUENCE, IMPLEMENTATION

.1 This item includes any access that the Contractor shall prepare, modify, execute in order to make the work indicated on the plans. These include access including but not limited to, access to the public road to the site, to storage areas, access to the shore, access to equipment and access to river barges. The Contractor shall provide that such access will depend on the sequence of work. This item includes not only the implementation but also the re-instatement of accesses to their original condition to the satisfaction of the NCC Representative, following

the work completion. Note that the Contractor is responsible for any study or perform additional analysis to do the work. Such studies or analyzes are in function of the methods used by the Contractor. It should include his schedule and he will pay for it in full.

.2 Work for this item are mainly function of methods used by Contractor and is primarily described on drawings and in Sections 01 33 00 and 01 56 00.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.13 PAY ITEM 13 - COFFERDAM AND/OR DEBRIS RETAINING STRUCTURE AND DEWATERING

.1 This item includes any cofferdam as well as any debris capture structure mainly during, but not limited to, demolition work and installation of retaining walls, as well as dewatering. This item also includes, but is not limited to, the installation of turbidity curtains, silt curtains on the banks, nets to foundation units and nets under the bridge, which would not be covered in environmental measures, as well as the implementation. The Contractor is responsible for any study, design or additional analysis to do the work. Such studies, design or analyzes are in function of the methods used by the Contractor. Refer to Section 01 35 43 for requirements and limitations concerning environment. It should include his schedule and he will pay for it in full. Contractor shall refer to General Condition GC3.4.5 stipulating that temporary structures are of the sole responsibility of Contractor, dewatering systems or cofferdams being considered as temporary structures. Avoid dispersion of any materials in the waterways.

.2 Work for this item are mainly function of methods used by Contractor and is primarily described on drawings and in Sections 01 33 00, 01 35 43, 01 56 00, 35 20 22 and 35 49 25.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.14 PAY ITEM 14 - PARTIAL DEMOLITION - EXISTING PIERS 2, 3 AND 4

.1 This item includes the partial demolition of the existing piers as indicated in the plans. The item includes, but is not limited to, the saw cuts, demolition, removal, and transport debris at appropriate landfills and approved by the NCC Representative, as well as any incidental expenditure. The Contractor shall take necessary measures to prevent damage to the parts of existing structures to be retained. Using of concrete breakers shear type is not allowed. The Contractor shall also take the necessary measures to prevent any dispersion of materials in the streams and no debris should fall into the waterways and shores.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 35 29.06, 01 74 21 and 02 41 16.

.3 This item is paid in cubic meter (m^3) at the price included in the Tender Form.

.4 Before beginning demolition work, the Contractor shall mark the area to be demolished, according the horizontal dimensions shown to plans and to the approval of the NCC Representative. The latter will take the necessary measures before starting demolition work to establish the amount payable for this item.

2.15 PAY ITEM 15 - DEMOLITION EXISTING CONCRETE ABUTMENT 1

.1 This item includes the demolition of existing abutment as indicated in the plans and existing excluding the footing. The item includes, but is not limited to, the excavation, demolition, removal, off- site transport of debris at appropriate landfills and approved by the NCC Representative, as well as any incidental expenses. The demolition also includes any concrete wing walls by the abutment, damaged or not, and includes debris of existing concrete. The Contractor shall take necessary measures to prevent damage to the parts of existing structures are retained. The Contractor shall also take the necessary measures to prevent any dispersion of materials in the streams and no debris should fall into waterways and shores.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 35 29.06, 01 74 21 and 02 41 16.

.3 This item is paid in cubic meter (m^3) at the price included in the Tender Form.

.4 The measurement will be done jointly in the presence of the NCC Representative over the course of the work carried out to determine the volumes achieved.

2.16 PAY ITEM 16 - DEMOLITION RETAINING WALL IN STONE MASONRY

.1 This item includes the demolition of the retaining walls indicated on the plans. The illustration on plans is schematic; the Contractor is responsible to visit the site prior to submission to validate the extent of demolition of these walls. The item includes, but is not limited to, the demolition, removal, off- site transport of debris at appropriate landfills and approved by the NCC Representative, as well as any incidental expenses. The Contractor shall take necessary measures to prevent damage to the parts of existing structures are retained. The Contractor shall also take the necessary measures to prevent any dispersion of materials in the streams and no debris should fall into waterways and shores.

.2 Work of this item is primarily described on drawings and in Sections 01 35 29.06, 01 74 21 and 02 41 16. The Contractor must also maintain and protect a section of masonry wall, according to the plans and specifications of landscape architecture belvedere.

.3 This item is paid in square meter (m²) at the price included in the Tender Form.

.4 Before beginning demolition work, the Contractor shall determine with the NCC Representative the stone walls to be demolished and set the dimensions of the latter for payment of this item.

2.17 PAY ITEM 17 - DEMOLITION EXISTING CONCRETE ABUTMENT 5

.1 This item includes the demolition of existing abutment as indicated in the plans and existing excluding the footing. The item includes, but is not limited to, the excavation, demolition, removal, off- site transport of debris at appropriate landfills and approved by the NCC Representative, as well as any incidental expenses. The demolition also includes any concrete wing walls by the abutment damaged or not, and includes debris of existing concrete. The Contractor shall take necessary measures to prevent damage to the parts of existing structures are retained. The Contractor shall also take the necessary measures to prevent any dispersion of materials in the streams and no debris should fall into waterways and shores.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 35 29.06, 01 74 21 and 02 41 16.

.3 This item is paid in cubic meter (m³) at the price included in the Tender Form.

.4 The measurement will be done jointly in the presence of the NCC Representative over the course of the work carried out to determine the volumes achieved.

NEW BRIDGE - FOUNDATIONS (PAY ITEMS 18 À 28)

2.18 PAY ITEM 18 - ORGANIZATION FOR PILE DRIVING

.1 This item covers the organization of the driving of piles. The price covers all the necessary facilities to perform work and which are not covered by other specific works in the price schedule.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 31 09 16.28, 31 61 13 and 31 62 16.16.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form. This item will be paid to the prorata of the advancement of works for pile driving.

.4 No measurement for payment will be made for this item.

2.19 PAY ITEM 19 - GRANULAR BEDDING PAD (PILE DRIVING AND UNDER PIER CAPS)

.1 Bedding made of granular material shall be put in place on the bottom of undisturbed soil excavation before the installation of piles as per Contractor's method and under the pier caps, all to be approved by NCC Representative.

.2 Work of this item is primarily described on drawings.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.20 PAY ITEM 20 - PILES ABUTMENT 1

.1 The price of this item covers include calculations, the design, supply of all materials, including the installation of piles (driving and embedment) so they achieve their required capacity, plates, rebars, shoes, fabrication, transport, handling, welds factory welds and welds made to the site, the inspection of welds and the implementation, and it includes any incidental expense to the piles of the abutment 1.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 31 09 16.28, 31 63 13 and 31 62 16.16. Refer to Appendix for Report prepared by Englobe attached to present specifications.

.3 This item will be paid by unit at the price included in the Tender Form.

2.21 PAY ITEM 21 - PILES ABUTMENT 2

.1 The price of this item covers include calculations, the design, supply of all materials, including the installation of piles (driving and embedment) so they achieve their required capacity, plates, rebars, shoes, fabrication, transport, handling, welds factory welds and welds made to the site, the inspection of welds and the implementation, and it includes any incidental expense to the piles of the abutment 2. The price also includes cost to cross existing boulders.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 31 09 16.28, 31 63 13 and 31 62 16.16. Refer to Appendix for Report prepared by Englobe attached to present specifications.

.3 This item will be paid by unit at the price included in the Tender Form.

2.22 PAY ITEM 22 - ADDITIONAL PILES – (AT THE REQUEST OF THE NCC REPRESENTATIVE)

.1 At the request of the NCC Representative, the Contractor could drive in place additional piles *in consideration with possible changes in site conditions*. The

price of this item covers in particular calculations, the design, supply of all materials, including the installation of piles (driving and embedment) so they achieve their required capacity, plates, rebars, shoes, manufacturing, transportation, factory welds, welds made to the site, the inspection of welds and implementation. It includes also the re-driving all piles, including the repeat. Also includes fees to go through stone boulders and any incidental expenses. This is optional and the NCC Representative will decide to use it depending on site conditions. No compensation shall be paid to Contractor if this item is not used.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 31 09 16.28, 31 63 13 and 31 62 16.16. Refer to Appendix for Report prepared by Englobe attached to present specifications.

.3 This item will be paid by unit at the price included in the Tender Form. This item is optional and the NCC Representative will decide when it will be used in full or partially depending of site conditions.

.4 No measurement for payment will be made for this item.

2.23 PAY ITEM 23 - RE-DRIVING UPHEAVALED PILES

.1 The price includes all expenses related to re-driving all piles, including the repeat, if required, on time and indications referred to plans and specifications.

.2 Work of this item is primarily described on drawings and in Sections 31 09 16.28, 31 63 13 and 31 62 16.16.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.24 PAY ITEM 24 - DYNAMIC TEST, CAPWAP ANALYSIS AND REPORT

.1 The price of this item covers in particular the supply of materials, achieving the dynamic tests, the CAPWAP analysis as well as the pile-driving analysis report. It also includes any incidental expense.

.2 Work of this item is primarily described on drawings and in Sections 01 45 00, 31 09 16.28, 31 63 13 and 31 62 16.16.

.3 This item will be paid by unit at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.25 PAY ITEM 25 - CONCRETE PIER CAP ON PILES (ABUTMENTS 1 AND 2)

.1 The price of this item includes, but not limited to, the supply of listings mixtures, formwork, chamfers, the supply of concrete, concreting, curing, cleaning of surfaces, finishing the concrete, transportation and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 03 10 00 and 03 30 00.

.3 This item is paid in cubic meter (m^3) at the price included in the Tender Form.

.4 No measurement will be done on site since concrete is paid according to the amounts calculated according to the theoretical dimensions.

2.26 PAY ITEM 26 - CONCRETE APPROACH SLAB

.1 The price of this product including but not limited to, the supply of listings mixtures, formwork, chamfers (if applicable), the supply of concrete, concreting, curing, surface cleaning, the membrane strips and their installation, concrete finishing and transport and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 03 10 00 and 03 30 00.

.3 This item is paid in cubic meter (m^3) at the price included in the Tender Form.

.4 No measurement will be done on site since concrete is paid according to the amounts calculated according to the theoretical dimensions.

2.27 PAY ITEM 27 - STEEL REINFORCEMENT - BLACK

.1 Black steel reinforcement bars are paid per kilogram according to the quantities placed in the formwork. The linear mass is determined by the designation of bars indicated in CSA G30.18 "Carbon steel bars for concrete reinforcement". The price covers the supply of materials, galvanizing when stipulated in the plans and specifications, fixing reinforcement and implementation and it includes any incidental expense. All the support bars should be included in the price of the works for which they are needed.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00 and 03 20 00.

.3 This item is paid in kilogram (kg) at the price included in the Tender Form.

.4 The measurement will be made of steel incorporated in the works, calculated from the theoretical masses specified unit to CSA standard G30.18, for lengths and the sizes of bars indicated or authorized in writing by the NCC

Representative.

2.28 PAY ITEM 28 - EXCAVATION/BACKFILL AT ABUTMENTS AND LOOKOUT

.1 The price of this item includes all activities related to the excavation and backfilling for the abutments and the belvedere/lookout including, but not limited to, the supply of materials, backfilling of excavations, disposal, off- site transport of debris (excluding items nos. 7 to 9), protection against frost of bottom of excavation, the implementation and any incidental expenses. The price for other excavations and embankments must be included in the price of the works in which they are needed.

.2 Work for this item is mainly function of Contractor's methodology and is primarily described on drawings and in Sections 01 33 00, 01 45 00 and 31 05 16.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

NEW BRIDGE - SUPERSTRUCTURE (PAY ITEMS 29 À 31)

2.29 PAY ITEM 29 - BEARINGS (4 TOTAL)

.1 The price covers in particular the supply and installation of bearings, including the upper and lower plates, anchor bars cast in place, hardware, including welds on site and welding quality control, and includes any incidental expenditure .

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 05 12 33 and 13 34 30.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.30 PAY ITEM 30 - NEW PREFABRICATED BRIDGE

.1 The price of this item includes, but not limited to, the design, preparation of shop drawings and fabrication drawings, supply of materials, manufacturing, transportation, handling, preparation of storage areas, lifting equipment including cranes, assembly, erection, installation, preparation and provision of the necessary documents, site supervision of manufacturer and any incidental expense to build the new prefabricated bridge. The bridge configuration shown in the drawings is by far the preference of the Federal Approval of the NCC; modifications will not be accepted. This item includes, but is not limited to, decking steel coated in the factory with a non-slip epoxy filler and aggregates,

the expansion joint and / or expansion plates, the railing (within bridge) and the pedestrian handrail.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, 05 12 33 and 13 34 30.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.31 PAY ITEM 31 - RETAINING WALLS REDI-ROCK WITH GEOGRID

.1 The price covers including the wall design, analysis, provision of documents such as shop drawings and calculation notes, certificates of compliance, samples, certificates, supply of all materials, including granular materials for the reinforced backfill mass walls, geogrids, geotextiles, the drains, the sleeves passing through the wall, the sealing compound, the insulation foam, vertical joints, changes of the alignment of the wall, the coping block and / or top free standing block, excavations and backfill of excavations, compaction, rigid insulation, off-site transportation of material in surplus if applicable, bedding, backfill to the top of the embankment wall, as well as the implementation, positioning, anchors, hardware, galvanized plates, inclusions, and it includes any incidental expenditure.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 45 00, and 32 32 34. Refer to Appendix for Stability Analysis Report prepared by Englobe attached to present specifications.

.3 This item will be paid per square meter (m²) corresponding to the total area of the wall, including buried depth 0.4 m to 1 m from the wall face as shown in the plans.

.4 No measurement will be done on site since retaining walls are paid according to the amounts installed and accepted by the NCC Representative.

RELATED OTHER WORKS (PAY ITEMS 32 À 66)

APPROACHES (PAY ITEMS 32 À 42)

2.32 PAY ITEM 32 - EXCAVATION 2ND CLASS

.1 This item includes all labor, materials, equipment and off- site transport and services necessary for the full execution of works of excavation 2nd class

needed to rebuild the bridge approaches.

.2 Works of this item are primarily described on drawings and in Section 31 23 33.01.

.3 This item will be paid in cubic meter (m^3) at the price included in the Tender Form.

.4 The measurement will be done jointly in the presence of the NCC Representative over the course of the work carried out in view of determining the volumes achieved.

2.33 PAY ITEM 33 - TREE CLEARING (DEFORESTATION)

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of tree clearing and of removal/off- site transport of trees, shrubs and vegetation (including tree stump removal, grubbing and pruning) needed to rebuild the bridge approaches. Ce travail doit être optimisé et exécuté avant le commencement de la nidification des oiseaux.

.2 Works of this item are primarily described on drawings and in Section 31 11 00.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement will be done. The amount will be paid in proportion to the progress of tree cutting.

2.34 PAY ITEM 34 - BACKFILL (BORROW 2ND CLASS)

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of backfilling with 2nd class borrowing needed to rebuild the bridge approaches.

.2 Works of this item are primarily described on drawing B-07 and in Section 31 05 10 and 31 05 16.

.3 This item will be paid in cubic meter (m^3) at the price included in the Tender Form.

.4 The measurement will be done jointly in the presence of the NCC Representative over the course of the work carried out to determine the volumes achieved.

2.35 PAY ITEM 35 - ASPHALT TO REMOVE

.1 This item includes all labor, materials, equipment for removal and off- site transport of debris and services necessary for the full execution of asphalt

removal work as specified in the plans.

.2 Works of this item are primarily described on drawings and in Section 02 41 13.14.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be done according to the number of square meters of produced asphalt removal, all in the presence of the NCC Representative.

2.36 PAY ITEM 36 - GEOTEXTILE MEMBRANE FOR PATHWAY

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of geotextile works for the reconstruction of the bridge approaches including, but not limited to, the supply, installation and the shaping of the membrane.

.2 Works of this item are primarily described on drawings and in Section 31 32 19.01.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be done in function of the number of square meter of geotextile installed by considering a maximum width payable as per the plans quotations, all in the presence of the NCC Representative.

2.37 PAY ITEM 37 - GRANULAR FOUNDATION MG 20, 300 MM THICK FOR PATHWAY

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of granular foundation works for the reconstruction of the bridge approaches including, but not limited to, the supply, installation, shaping and compaction of the layer of granular materials.

.2 Works of this item are primarily described on drawings and in Sections 31 05 10, 31 05 16 and 32 11 23.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be made based on the number of foundation square meter installed by considering a maximum width payable as per the plans, all in the presence of the NCC Representative.

2.38 PAY ITEM 38 - ASPHALT EC-10, 50 MM THICK FOR PATHWAY

.1 This item includes all labor, materials, equipment and services necessary for the

full execution of paving works on the pathways including, but not limited to, the saw cuts to match with the existing asphalt, the supply, installation with profile roll forming equipment, shaping and compaction of bituminous asphalt layer including any other activities necessary to carry out the work. Required asphalt on the damaged pathway portion because of its use as an access road is included in the refurbishment of the access.

.2 Works of this item are primarily described on drawings and in Sections 31 05 16 and 32 12 16.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be done according to the number of asphalt square meter achieved by considering a maximum width dimensions payable under the plans, all in the presence of the NCC Representative.

2.39 PAY ITEM 39 - GEOTEXTILE MEMBRANE FOR LOOKOUT

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of geotextile works for the construction of the platform of the belvedere, including but not limited to, the supply, installation and shaping of the membrane.

.2 Works of this item are primarily described on drawings and in Section 31 32 19.01.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be done according to the number of square meters of geotextile put in place, all in the presence of the NCC Representative.

2.40 PAY ITEM 40 - GRANULAR FOUNDATION MG 20, 300 MM THICK FOR LOOKOUT

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of granular foundations for the construction of the platform of the belvedere, including but not limited to, supply, installation, the shaping and compaction of the layer of granular materials.

.2 Works of this item are primarily described on drawings and in Sections 31 05 10, 31 05 16 and 32 11 23.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be done according to the number of square meters of geotextile made, all in the presence of the NCC Representative.

2.41 PAY ITEM 41 - ASPHALT EC-10, 50 MM THICK FOR LOOKOUT

.1 This item includes all labor, materials, equipment and services necessary for the complete execution of asphalt works of the belvedere, including but not limited to, the saw cuts at connections to match with the existing asphalt , supply,

laying with roll forming equipment, shaping and compaction of bituminous asphalt layer including all other activities necessary for carrying out the work.

.2 Works of this item are primarily described on drawings and in Sections 31 05 16 and 32 12 16.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 The measurement will be done according to the number of square meters of geotextile made, all in the presence of the NCC Representative.

2.42 PAY ITEM 42 - MARKINGS

.1 This item includes labor, materials, equipment and services necessary for the complete execution of trail marking works for the full length of the bridge and reconstructed approaches. The marking required on the damaged pathway portion since its use as an access road is included in the re-instatement of the pathway.

.2 Works of this item are primarily described on drawings and in Section 32 17 23.

.3 This item will be paid on a linear meter basis at the price included in the Tender Form.

.4 The measurement will be done according to the number of linear meter of marking performed without consideration of voids, all in the presence of the NCC Representative.

ARCHITECTURAL LANDSCAPING (INCLUDING BELVEDRE (LOOKOUT) & PLANTATIONS EAST APPROACH, EXCLUDING ASPHALT AND REDI ROCK RETAINING WALLS)-(PAY ITEMS 43 À 66)

2.43 PAY ITEM 43 - SITE PREPARATION

.1 The price of this item covers include finishing earthworks, grading, excavation pits, planting beds and ditches, removal and storage (2) walls of historic stones, one (1) historic sump plate and one (1) railing section of 2.4 m of the existing

bridge, general cleaning of the site and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 31 23 33.01 and 32 91 19.13.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.44 PAY ITEM 44 - SEEDING

.1 The price of this item covers in particular the installation of topsoil, leveling and installation of hydroseeding and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 32 91 19.13 and 32 37 00.

.3 This item will be paid in square meter (m²) at the price included in the Tender Form.

.4 Measurement in square meter (m²).

2.45 à 2.49 PAY ITEM 45 à 49 - PLANTATION

.1 The price of this particular item covers the supply, planting, soil, topsoil, mulch, amendments, stakes, winter protection and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 31 23 33.01, 32 91 19.13 and 32 93 10.

.3 This item will be paid relatively to the various units of plants at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.50 PAY ITEM 50 - SURFACE OF MULCH

.1 The price for this item covers mainly the supply and installation of a minimum 100 mm thick layer of cedar mulch and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 32 93 10.

.3 This item is paid in square meter (m²) at the price included in the Tender Form.

.4 Measurement in square meter (m²).

2.51 PAY ITEM 51 – PRECAST CONCRETE PAVER

.1 The price of this item covers in particular the compacted granular base, laying bed, supply and installation of pavers, the polymetric set and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 32 11 16.01 and 32 14 13.

.3 This item is paid in square meter (m²) at the price included in the Tender Form.

.4 Measurement in square meter (m²).

2.52 à 2.54 PAY ITEMS 52 à 54 – CONCRETE - PRECAST / POURED IN PLACE

.1 The price of this item covers in particular the compacted granular base, supply and installation of concrete works slabs as follows and any incidental expenses.

- Item 52 - Concrete slab for bench - Precast concrete or poured in place: 1000 X 2000 X 150mm, including granular foundations.
- Item 53 - Precast concrete slab for interpretation panel and Trans Canada Trail panel, including granular foundation.
- Item 54 - Concrete sonotube for installation of historic railing section including reinforcing steel bars (vertical 5-15 M and 10M stirrups 300 mm c/c).

.2 Work of this item is primarily described on drawings and in Sections 32 11 16.01 and 32 37 00.

.3 This item will be paid by unit at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.55 PAY ITEM 55 - FURNITURE

.1 The price of this item covers in particular the supply and installation of a bench on concrete base including vandal resistant type anchors and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 03 30 00 and 32 37 00.

.3 This item will be paid by unit at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.56 PAY ITEM 56 - MASONRY WALL

.1 The price of this item covers the coordination, dismantling of existing masonry walls for the recovery of good stones, construction of masonry with existing good stones, including all materials including stones and mortar, transport and required labor as well as the transport of debris off site as stipulated in the contract.

.2 Work of this item is primarily described on drawings and in Sections 01 35 43, 01 45 00, 01 74 11, 01 74 21, 04 03 07, 04 05 00 and 04 05 12.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.57 PAY ITEM 57 - SECTION OF HISTORICAL RAILING

.1 The price of this item covers in particular the supply and installation of a 2.4 m section of the existing historic railing from the existing bridge including site preparation, protection treatment of steel surfaces (moderate sanding and three layers of transparent polyurethane paint), steel extensions at bottom of posts made of painted steel angles, as shown on drawings, and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections.

.3 This item will be paid by unit at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

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2.58 PAY ITEM 58 - HISTORICAL SUMP PLATE

.1 The price of this item covers in particular the provision and installation on the belvedere ground of the historical sump plate recovered from the site, including welds for 3 steel anchor rods to be supplied to prevent the removal of the sump plate out of ground and any incidental expense.

.2 Work of this item is primarily described on drawings.

.3 This item will be paid by unit at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.59 à 2.64 PAY ITEMS 59 à 64 - TREE PLANTATION (WEST APPROACH)

.1 The price of this item covers the coordination, delivery and implementation for

planting trees as stipulated in the contract and any other work explicitly or implicitly required and is not defined in the specifications and drawings before, during and termination of the contract. Includes the warranty maintenance.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 35 43, 01 45 00, 01 61 00, 01 74 11, 32 93 10 and 32 93 43.01.

.3 This item will be paid by unit at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.65 PAY ITEM 65 - RAILINGS, INSTALLATION ASIDE RETAINING WALL

.1 The price of this item covers in particular the provision and installation of concrete sonotube 1500 mm deep, 300 mm diameter, including reinforcing steel bars (vertical 5-15 M and 10M stirrups 300 mm c/c), and the supply and installation of fencing (railing) of 1.5 m high and any incidental expense.

.2 Work of this item is primarily described on drawings and in Sections 03 30 00 and 32 31 13.

.3 This item is paid in linear meter (l.m.) of railing installed at the price included in the Tender Form.

.4 Measurement in linear meter (l.m.).

2.66 PAY ITEM 66 - RAILINGS, INSTALLATION ON TOP OF RETAINING WALL

.1 The price of this item covers in particular the supply and installation of fencing (railing) of 1.5 m high including steel anchor plates welded in factory for the bolting of poles on top of the precast concrete walls type Redi-Rock, vandal resistant type of anchor and any incidental expenses.

.2 Work of this item is primarily described on drawings and in Sections 32 31 13.

.3 This item is paid in linear meter (l.m.) of railing installed at the price included in the Tender Form.

.4 Measurement in linear meter (l.m.).

2.67 PAY ITEM 67 – STONES (PROTECTION EMBANKMENT), 300-500 CALIBER, 50 % > 400 MM

.1 This item includes the excavation, geotextile, the installation of protection embankment stones 300-500 and any incidental expense.

.2 Work of this item is primarily described on drawings and in Sections 35 31 19.

.3 This item is paid in square meter (m²) at the price included in the Tender Form.

.4 Measurement is done according surface installed, jointly with NCC Representative.

2.68 PAY ITEM 68 – STONE RIP-RAP (EMBANKMENT PROTECTION), 200-300 CALIBER, 50 % > 250 MM

.1 This item includes the excavation, geotextile, the installation of protection embankment stones 200-300 and any incidental expense.

.2 Work of this item is primarily described on drawings and in Sections 35 31 19.

.3 This item is paid in square meter (m²) at the price included in the Tender Form.

.4 Measurement is done according surface installed, jointly with NCC Representative.

2.69 PAY ITEM 69 - PROJECT RECORD DOCUMENTS

.1 This item includes the preparation of the project file (construction site plans) by the Contractor so the Consultant could prepare the final plans of the work. The NCC Representative reserves the right to withhold payments if the construction drawings are not provided by the Contractor.

.2 Work of this item is primarily described on drawings and in Sections 01 72 00.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.70 PAY ITEM 70 - ELIMINATION OF NON OFFICIAL TRAILS

.1 The price of this item covers the coordination and the restoration and closure works of trail S2, 154 m long, and its bypass path of about 48 m long in sensitive natural environments (marshes and swamps), located at southeast pedestrian bridge, to restore the site to a natural state as stipulated in the contract. Also includes removing the fallen tree in the S1 path and work for the restoration and closure of the bypass path on a length of about 24 m. Also includes the removal of the four (4) dead trees in the path S1.

.2 Work of this item is primarily described on drawings and in Sections 01 35 43, 01 45 00, 01 74 11, 01 74 21 and 30 35 10.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.71 PAY ITEM 71 - NESTING AREAS FOR NORTHERN MAP TURTLE

.1 The price of this item covers the coordination, delivery and installation of two (2) nesting areas for Northern Map Turtle. This item includes a set supply 25 mm thick on a layer of pea gravel of 75 mm in thickness at two areas of about 1.5 meter by 1.5 meter at open locations and exposed to the sun along the discharge bank, south of the east abutment. The precise locations will be determined by NCC Representative and will be located at less than 40 m from the work site.

.2 Work of this item is primarily described on drawings and in Sections 01 33 00, 01 35 43, 01 45 00, 01 61 00 and 01 74 11.

.3 This item will be paid on a lump sum basis at the price included in the Tender Form.

.4 No measurement for payment will be made for this item.

2.72 PAY ITEM 72 – ALLOWANCE FOR UNFORESEEN WORKS

.1 The price of this item covers the coordination, furniture and installation of all materials as well as the labor for any additional unforeseen works due to unknowns since as-built drawings of the original bridge are not available. This item could include, but not limited to, all the additional works and their adjustments/modifications required (excavation, breaking/ removal of existing concrete, removal of existing piles, additional concrete placement, adjustments to earth reinforced retaining walls, backfill and its compaction, etc.) within the vicinity of the remaining existing abutments so to suit to unknown site conditions. No compensation shall be paid to Contractor if this item is not used.

.2 Work of this item is not described on drawings and in Sections. This item shall only be used with the authorization of the NCC Representative. If changes are required, they shall be determined one a time and shall be discussed with the Contractor and approved by the NCC Representative.

.3 This item will be paid on a lump sum basis and/or by unit, one item at a time if required.

.4 Measurement for payment will be made for this item.

PART 3 - EXECUTION

3.1 NO OBJECT

.1 No object.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 The current section includes requirements and presentation procedure for the following documents and products produced by the Contractor and issued for NCC Representative review:
- .1 Shop drawings
- .2 Schedule
- .3 Product Data
- .4 Samples
- .5 Methods
- .6 Drawings
- .7 Design note
- .8 Certificate of compliance.

1.2 ADMINISTRATIVE

.1 Submit to NCC 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 completed.

.3 Present shop drawings, product data, drawings, design notes, 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 NCC 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.

1.2 ADMINISTRATIVE (Suite)

.6 Notify NCC 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, omissions and deviation in submission from requirements of Contract Documents is not relieved by NCC Representative's review of submittals.

.9 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 drawings stamped and signed by professional engineer registered and licensed in Quebec by Ordre des ingénieurs du Québec.

.3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes, elevations, 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 plans and specifications showing the section numbers and drawing numbers.

.4 Allow 10 working days for NCC Representative's review of each submission unless a more stringent requirement is noted in drawings and specifications.

1.3 SHOP DRAWINGS AND PRODUCT DATA (Suite)

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

.6 Make changes in shop drawings as NCC Representative may require, consistent with Contract Documents. When resubmitting, notify NCC Representative in writing of revisions other than those requested.

.7 Accompany submissions with transmittal letter, in duplicate, containing:
- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each document 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 detail and material.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Elevations.
  - .4 Temporary equipments.
  - .5 Temporary structures.
  - .6 Setting or erection details.
  - .7 Capacities.
  - .8 Performance characteristics.
  - .9 Standards.
  - .10 Operating weight.
  - .11 Wiring diagrams.
  - .12 Single line and schematic diagrams.
  - .13 Relationship to adjacent work.

1.3 SHOP DRAWINGS AND PRODUCT DATA (Suite)

.8 (Suite)

.5 (Suite)

.9 After NCC Representative's review, distribute copies of shop drawings, plans, working methods and, data sheet.

.10 Submit one print et one electronic copy of shop drawings for each requirement requested in specification Sections and as NCC Representative may reasonably request.

.11 Submit one electronic copy of document for requirements requested in specification Sections and as requested by NCC Representative where shop drawings or plan will not be prepared due to standardized manufacture of product.

.12 Submit one electronic copy of test reports for requirements requested in specification Sections and as requested by NCC 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 the delay prescribed elsewhere in the contract documents.

.13 Submit one electronic copy and one print of certificates for requirements requested in specification Sections and as requested by NCC Representative.

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

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

.14 Submit one electronic copy and one print of manufacturers instructions for requirements requested in specification Sections and as requested by NCC Representative.

1.3 SHOP DRAWINGS AND PRODUCT DATA (Suite)

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

.15 Submit one electronic copy and one print of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by NCC Representative.

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

.17 Submit one electronic copy and one print of schedules, work methods, calculation notes, and Operation and Maintenance Data for requirements requested in specification Sections and as requested by NCC Representative.

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

.19 If upon review by NCC Representative, no errors or omissions are discovered or if only minor corrections are made, one electronic copy 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.

.20 The review of shop drawings by NCC Representative is for sole purpose of ascertaining conformance with general concept.
.1 This review shall not mean that NCC approves detail design inherent in document, 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.

1.3 SHOP DRAWINGS AND PRODUCT DATA (Suite)

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

.21 Any discrepancies in drawings and specifications shall be mentioned without cost to NCC Representative before submitting documents. Contractor shall ask required clarifications before issuing documents.

1.4 SAMPLES

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

.2 Notify NCC Representative in writing, at time of submission of deviations in samples from requirements of Contract Documents.

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

.4 Adjustments made on samples by NCC Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to NCC Representative prior to proceeding with Work.

.5 Make changes in samples which NCC Representative may require, consistent with Contract Documents.

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

1.5 CERTIFICATES OF COMPLIANCE

.1 Submit to NCC Representative a certificate of compliance certifying that prefabricated bridge erection is in compliance with approved shop drawings. The certificate of compliance shall be signed and sealed by an engineer licensed by Ordre des ingénieurs du Québec.

.2 Submit to NCC Representative aSubmit a certificate of compliance for the following cases, but not limited to:
.1 Unless opposite opinion from NCC Representative, all pieces or components for which shop drawings are requires.

1.6 OTHERS PRESENTATIONS

.1 Update construction schedule and planned cash disbursement every month.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

FIN DE SECTION

PART 1 – GENERAL INFORMATION

1.1 REFERENCES

.1 Ministère des Transports du Québec
.1 Cahier des charges et devis généraux (CCDG) [General Specifications], current edition.
.2 Volume V – Traffic Conctrol Devices (Norme des ouvrages routiers).

1.2 GENERAL REQUIREMENTS

.1 The stipulations regarding traffic management and construction signage apply to all work undertaken as part of this contract.

.2 Signage must respect the requirements contained in Article 10.3 "Maintien de la circulation et signalisation" in the CCDG, the requirements in Volume V – Traffic Control Devices (Norme des ouvrages routiers) from the Ministère des Transports du Québec and the requirements contained in the *Safety Code for the Construction Industry.*

1.3 TRAFFIC MANAGEMENT PLAN

.1 For all work to be completed under this contract, the Contractor must prepare a traffic management plan that respects Article 10.3 of the CCDG. The plan must also comply with the following constraints:
.1 No traffic blocking will be permitted southbound on Fournier Blvd.
.2 As for the northbound lanes of Fournier Blvd., the Contractor must maintain two lanes of traffic at all times. Under special circumstances, e.g. the transportation of large materials, the Contractor can submit a request to the NCC Representative at least fifteen (15) business days in advance in order to close one (1) or two (2) traffic lanes. The closing of one (1) lane can take place Monday to Friday between 2:00 and 7:00 pm. The closing of two (2) lanes cannot take place Monday to Friday between 5:00 am and 9:00 pm. Lane closures must be planned in a way that limits the impact on vehicle traffic and mass transit.
.3 The Contractor must comply with the worksite accesses indicated in the plans. Worksite access must be provided in a safe manner and the Contractor must plan for all the required signage. To do so, the Contractor is authorized to close the mass transit lane while limiting such closures to the required

minimum. No construction areas or parking will be authorized on the mass transit lane.

.4 The Contractor will take note that the posted speed limit on Fournier Blvd, northbound, will be adjusted to 50 km/h for the entire duration of the construction work.

.5 For the duration of the construction work, the Contractor must ensure a safe temporary pathway as a detour for the users of the Voyageurs Pathway. This detour must be compliant with the plans. For the section using the Fournier Blvd. roadway, the Contractor must set up a pathway with all the required signage and marking required within the boundaries of the shoulder. There must also be a physical separation consisting of concrete safety barriers between the traffic lanes and the temporary pathway. The physical separation between the traffic lanes and temporary pathway must be at least 1.1 m in height. The existing safety barrier on the bridge must also be enhanced with temporary fencing to ensure a physical separation that is at least 1.4 m in height between the temporary pathway and the waterway.

.6 If required, work requiring traffic blocking (complete or partial closure of a lane or shoulder) can be carried out at night or during the weekend. The Contractor must secure authorization from the City of Gatineau’s Executive Committee in order to undertake work during these periods.

.7 If necessary or at the request of the NCC Representative or any other involved authority (Police Department, CSST, etc.), the Contractor must be able to make whatever modification (adding, replacement, change in configuration, etc.) to the signage in place, within thirty (30) minutes during working hours and within sixty (60) minutes outside of working hours.

.8 The Contractor must provide all the details regarding the transportation of large-sized materials requiring special management for their delivery to the worksite.

.9 The Contractor must prohibit or prevent the access of boaters under the equipment and mobile materials (e.g. but without being limited to the masts of lifting equipment and the prefabricated bridge at the time of its installation) as well as under the deck when concrete is being cut, the existing steel beams are being removed or any work during the demolition of the deck.

.10 The Contractor is also authorized to prohibit the passing of pleasure boaters at the bridge area for the entire duration of the construction work as long as the NCC Representative is informed of the measures the Contractor is planning to put in place at least seven (7) days before the production of the signs, their installation and the application of the proposed measures. It should be noted that the size of the signs proposed by the Contractor in such cases must satisfy the size and characteristics of the signs listed in the plans and be in line with the clearance height. Furthermore, the Contractor cannot proceed before the NCC Representative has issued approval.

.2 The sequencing of the work must be determined by the Contractor and be included in the traffic management plan. The Contract must ensure that the sequencing of the work respects the requirements contained in this document. This sequencing must present all the separate phases required for the complete execution of the work.

.3 **The traffic management plan and the temporary signage plans (see Article 1.6). They must be prepared, signed and sealed by an engineer who is a member in good standing of the Ordre des ingénieurs du Québec. These documents must be submitted no later than the first worksite meeting. No work will be authorized to begin before the traffic management plan and the maintenance plan have been accepted.**

1.4 UNAUTHORIZED CLOSING AND BLOCKING OF LANES

.1 All Contractor operations that require a lane closure or blocking must take place outside the hours defined in Article 1.3. These operations include the setting up of temporary signage and their complete removal. During these said hours, traffic lane closures and blocking are not permitted.

.1 Blocking is defined as an unusual obstacle (personnel and equipment for putting up temporary signage and removing it completely, backfill, materials, pick-up trucks, service trucks or others) located less than four (4) metres from a traffic lane.

1.5 WORKSITE ACCESS AND TEMPORARY PATHWAY

.1 Only commercial vehicles belonging to the Contractor or its subcontractors are authorized to operate within the construction area. With the exception of bulk trucks, vehicles entering the construction area must be equipped with flashing lights that are compliant with the characteristics mentioned in Article 4.36.1 of Volume V – Traffic Control Devices (Norme des ouvrages routiers) by the Ministère des Transports du Québec.

.2 At no time is the Contractor permitted to cross traffic lanes on foot or stop traffic to allow vehicles to enter or exit the worksite.

.3 The Contractor must clearly mark, sign, control and secure each worksite access.

.4 The Contractor must limit itself to using the existing authorized access road as shown on the plan for accessing the construction areas.

.5 The Contractor must remember that the access way boundaries are non-access zones and cannot be entered.

.6 Certain sections of the access road still need to be constructed whereas others already exist. The Contractor must make sure that the access road is appropriate for the safe movement of machinery and trucks required to complete the work. In the event that temporary modifications are required, the Contractor must submit a plan to the Engineer indicating in a clear manner, including

the dimensions, all the modifications it plans to implement. This work could include, among other things, the widening of the platform through excavation or backfilling, the moving of fencing, the installation or extending of culverts, etc. In all cases, the Contractor must ensure that this type of work does not negatively impact the flow of runoff water, does not affect the stability of the site and that any works installed are removed once the work has been completed. The Contractor is responsible for returning the access road zones to an equivalent state. This would therefore involve the reconstruction of the existing pathway being used as an access road.

.7 A temporary pathway will also need to be constructed. This pathway must consist of a granular foundation 150 mm thick composed of MG 20 granular material and a 50 mm layer of EB-10C asphalt. The Contractor must have a plan for removing the existing topsoil and completing the landscaping work required to construct a trail with a continuous and regular profile and a transverse slope of 2%. The Contractor must also plan for the installation of culverts of sufficient diameter to ensure the drainage of runoff water and ditches. Once the work under this contract has been completed, the Contractor must plan for the removal of all the materials required in the construction of the temporary pathway and bring in the topsoil and seeding that is compliant with the stipulations in the Seeding section.

1.6 SCOPE OF TEMPORARY SIGNAGE WORK

.1 The work, without being limited to the following, consists of providing and installing the temporary signage needed for maintaining traffic, protecting users and protecting workers during the completion of the work included in this contract.

.2 The Contractor is responsible for the safety of users moving around on its worksite as well as the health and safety of its employees and all workers working there. The Contractor must therefore prepare a detailed and complete traffic management plan for the entire duration of the contract. The traffic management plan must take into account vehicular, pedestrian and cyclist traffic.

.3 At the first worksite meeting, the Contractor must present to the NCC Representative for approval the detailed signage plan that will be implemented for the execution of the work. This plan must contain the required signage for each work phase. The plans must be signed and sealed by an engineer who is a member in good standing of the Ordre des ingénieurs du Québec.

.4 In addition to the temporary signage work stemming directly from this reconstruction work, the NCC Representative can request that additional temporary signage work be completed in order to ensure the safety of workers and road users or to improve traffic flow. In such a case, the Contractor must be able to provide the services within the prescribed timeframes.

.5 The work includes, without being limited to:
.1 The supply, installation and removal of temporary signage mainly on identified road sections, neighbouring highways and roads, all in accordance with the signage plans prepared by the Contractor, in compliance with the requirements of Volume V and signed by a member of the Ordre des ingénieurs du Québec.
.2 The installation, maintaining and removal of temporary, non-lit vertical signage.
.3 The management of the parking areas in the work zones.
.4 The installation, maintaining and removal of lit signage arrows as well as the required barriers, when needed.
.5 The manufacturing, installation, maintaining and removal of additional signage.
.6 The temporary ballasting of catch basin grills and/or manholes-catch basins.
.7 The other work required for the complete execution of the project in a safe manner for road users, workers and river users.

1.7 MAINTENANCE OF THE TEMPORARY SIGNAGE

.1 When the temporary signage is in place, whether in use or not, the Contractor must provide the labour, equipment and materials needed for maintaining said signage and keeping it in the right location in good condition. In order to do so, the Contractor must provide a maintenance team.
.1 This team must be able to respond to requests from the NCC Representative within thirty (30) minutes. This team must also conduct a minimum of two (2) daily visits covering the entire worksite.

1.8 MATERIALS AND EQUIPMENT

.1 All the materials and equipment required for completing the temporary signage work will be provided and paid for by the Contractor.
.1 The materials and equipment required for the temporary signage will remain the property of the Contractor.

1.9 PERSON RESPONSIBLE FOR SIGNAGE AND WORKSITE MANAGER

.1 The requirements regarding the presence of a person responsible for signage as well as the certifications required by the Contractor’s personnel and subcontractors assigned to the temporary signage work are defined in Article 10.3.3 of the CCDG.

1.10 CONTRACTOR'S REPRESENTATIVE

.1 As a complement to Article 6.7 of the CCDG, the continuous presence of a Contractor's representative at the worksite is required throughout the execution of the temporary signage work. Furthermore, the NCC Representative must be able to reach this representative at all times. In order to achieve this, the Contractor must provide its representative with an operational cell phone at all times including an on-hold line.

.2 Furthermore, this representative and the work coordinator must be available to, at the NCC Representative's request, report on worksite difficulties and participate in the search for technical solutions.

1.11 SIGNAGE AND MAINTENANCE TEAMS

.1 The requirements for the signage team must match those described in Article 10.3.3 of the CCDG.

.2 The Contractor will appoint a worksite manager from its personnel who has successfully completed the training "Gestion des impacts des travaux routiers sur la circulation (STC-201) [Managing the impacts of road work on traffic]."

.3 The Contractor will appoint someone to be responsible for the signage, someone who has successfully completed the training "Gestion des impacts des travaux routiers sur la circulation (STC-201)" as well as the training "Supervision et surveillance de la signalisation des travaux de chantiers routiers (STC-102) [Supervision and surveillance of signage for road work]" and who has a valid certification for both of these for the duration of the work.

1.12 PERSONNEL REQUIREMENTS

.1 The personnel from the signage and maintenance teams must satisfy the following requirements:
.1 Be at least 18 years of age;
.2 Have taken the course "Installation de la signalisation de travaux de chantiers routiers (STC-101 [Installation of road work signage]", offered by the AQTR and hold a valid certification for the duration of the work.

.2 Flaggers must have taken the flagger training offered by the AQTR.

.3 At the project start-up meeting, the Contractor must provide the NCC Representative with a list of its employees assigned to its teams as well as copies of the AQTR certifications.

.4 The NCC Representative reserves the right to refuse worksite access to all workers who act in violation of the information received during the STC-101 course offered by the AQTR.

1.13 VEHICLE REQUIREMENTS

.1 Every service vehicle must have the following characteristics:
.1 Be a pick-up truck;
.2 Have a minimum gross vehicle weight of 2700 kg;
.3 Be equipped with flashing arrow lights and road work traffic lights (flashing lights) that are compliant with articles 4.36 and 4.37 in Volume V.
.4 Have a type III yellow reflective strip with a minimum width of 75 mm (Norme 14101 des ouvrages routiers – Tome VII – Matériaux [road work standards – materials]) on both sides of the vehicle.

1.14 LANE CLOSURES

.1 Traffic lane closures must be done in compliance with the signage plans and Article 4.3.3 of Volume V. These closures must be undertaken using visual markers that are compliant with the requirements of Volume V.

.2 For this contract, temporary signage installed for a period of less than twenty-four (24) hours but for more than fifteen (15) minutes must be compliant with long-term signage.

.3 The clearance height beneath the closure signs inserted in a row of visual markers must be 1.2 m. Any sign installed too low or hidden by an obstacle will not be accepted.

.4 Any mobilization, demobilization and signage maintenance is deemed very short-term work that can be planned and programmed for S<90 km/h. The principles of TCD 089 must be used.

1.15 VISUAL MARKERS

.1 Lane closures must be completed using visual markers T-RV-2, T-RV-7 and T-RV-9, in compliance with the requirements in Volume V. Metallic markers are not permitted.

.2 In all cases, visual markers must be tested to ensure their stability. Sandbags are not acceptable as weights. When taking down the temporary signage, the weights must be collected along with the visual markers.

1.16 WORK SIGNAGE

.1 All work signage must satisfy the following requirements:

.1 Be covered in type VII fluorescent reflective film (Norme 14101 des ouvrages routiers - Tome VII – Matériaux [Standard 14101 Regarding Road Work - Tome VII – Materials]) if they are orange in colour and included in Appendix B of Chapter 4 of Volume V;
.2 Have the minimum dimensions of 600 mm x 600 mm for square signs and 600 mm x 750 mm for rectangular signs.

.2 All signs must be in new condition for the entire duration of the work. All pictograms must be identical (shape, proportions and alphanumeric characters) to those illustrated in Appendix B of Chapter 4 of Volume 5.

.3 The stability of the signs must be ensured by a sufficient number of weights for keeping the sign properly in place. Sandbags are not acceptable weights under any circumstances.

.4 When not in use, the sign must be covered in accordance with Article 4.44 of Volume V.

1.17 SPECIAL SIGNS

.1 If necessary, temporary signage must be manufactured as shown on the plans sent by the NCC Representative. They must be covered by type III orange reflective film (Norme 14101 des ouvrages routiers – Tome VII – Matériaux). The lettering must be black. If applicable, the route number crest appearing on these signs must be a type III film.

.2 Depending on the requests made by the NCC Representative, these signs can be installed on road sign gantries, lampposts or roadside sign posts. They are to be made of aluminum.

.3 To warn pleasure boaters regarding the work, two (2) signs will be installed on the shores of the Lake Leamy outlet. These signs will be compliant with the indications in the plans and installed on roadside sign posts. These signs must be painted yellow with black lettering and be bordered by a yellow reflective strip that is 100 mm wide. As the work progresses, the text must be adjusted based on the clearance available.

.4 To warn pedestrians and cyclists of the temporary pathway closure, signs will be installed on the edge of the pathway in strategic areas to be determined. These signs will be compliant with the indications in the plans and installed on roadside sign posts.

.5 The constructed signs must remain available for the duration of the contract.

.6 At the request of the NCC Representative, the Contractor will manufacture and install various additional signage needed for managing and maintaining traffic. The signs will be manufactured and installed in accordance with the sketches and plans that the NCC Representative sends to the Contractor at the beginning and throughout the work, based on needs. The signs must be installed with a ground clearance of 2.1 m.

.7 Following a request made by the NCC Representative, the Contractor will have forty-eight (48) hours to manufacture and install the signs at the designated locations.

1.18 T-B-2 BARRIERS

.1 When lanes are completely closed, they must be blocked by one or more T-B-2 barriers so as to block off 80% of the usable roadway (including the shoulder). All barriers must have a sign that is appropriate to the type of closure, in compliance with Article 4.6 of Volume V.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 BACKGROUND AND PUROPOSE

In July 2015, an environmental characterization of the soils was carried out by Englobe (No. Ref.: 033-B-0012112-2HG-R-0001-00) for the proposed pedestrian bridge across the Leamy Creek in Gatineau (Quebec). The work site is near the former landfill site in Hull. A copy of this report is attached to the tender documents.

Thus, on the basic of results obtained during the study, it appears that the soil taken from the boreholes and analyzed by the laboratory have, for the selected parameters, concentrations below the level C criteria of the MDDELCC policy. These soils are compatible with the current or future usage ofthe study area. However, it should be noted that soils with concentrations within the levels A-B and B-C criteria of the Policy of the MDDELCC have been identified during the work.

Consequently, during the excavation work of the soils of the entire study area and their elimination off-site, soils with concentrations higher than the level A criteria of the Policy of the MDDELCC will need to be managed according to procedures found in the "Grille de gestion des sols contaminés excavés intérimaire" of the Policy of the MDDELCC and Regulations on storage and transfer centers for contaminated soils. Likewise, if backfill soil needs to be imported from an external site, it is recommended to ensure that the environmental quality follows the "Grille de gestion des sols contaminés excavés intérimaire" of the Policy of the MDDELC and Regulations on storage and transfer centers for contamined soils.

1.2 REFERENCES

.1 Loi sur la qualité de l'environnement (Gouvernement du Québec) L.R.Q., C. Q-2.

.2 Politique de protection des matériaux et de réhabilitation des terrains contaminés (MDDEFP).

.3 Règlement sur l'enfouissement des matériaux contaminés (Gouvernement du Québec) D. 843-2001, (2001) 133 G.O. II.

.4 Règlement sur la protection et la réhabilitation des terrains (Gouvernement du Québec) D. 216-2003 (2003) 135 G.O. II.

.5 Règlement sur l'enfouissement et l'incinération de matière résiduelles L.R.Q., C. Q-2, r. 602.

.6 Guides, lignes directrices du ministère de l'Environnement du Québec (MDDEFP).

.7 Règlement sur les matières dangereuses, D.1310-97, (1997) 129 G.O. II, 6691 (C. Q.2.R.15.2).

.8 Règlement sur transport des matières dangereuses (C-24.2, R.4.2) (Québec).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submittals for Progress Meetings: make submittals at least 24 hours prior to scheduled progress meetings as follows:
.1 Updated progress schedule detailing activities. Include review of progress with respect to previously established dates for starting and stopping various stages of Work, major problems and action taken, injury reports, equipment breakdown, and material removal.
.2 Copies of transport manifests, trip tickets, and disposal receipts for waste materials removed from work area.
.3 Other information required by NCC Representative or relevant to agenda for upcoming progress meeting.

1.3 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.3 Site Layout: within 7 days after date of Notice to Proceed and prior to mobilization to site, submit site layout drawings showing existing conditions and facilities, construction facilities and temporary controls provided by Contractor including following:
.1 Equipment and material staging areas.
.2 Soil stockpile areas.
.3 Exclusion Zones, Contaminant Reduction Zones, and other zones specified in Contractor's site-specific Health and Safety Plan.
.4 Wastewater storage tanks areas.

1.4 REGULATORY REQUIREMENTS

.1 Comply with federal, provincial, and local anti-pollution laws, ordinances, codes, and regulations when disposing of waste materials, debris, and rubbish.

.2 Work to meet or exceed minimum requirements established by federal, provincial, and local laws and regulations which are applicable.
.1 Contractor: responsible for complying with amendments as they become effective.

.3 In event that compliance exceeds scope of work or conflicts with specific requirements of contract notify NCC Representative immediately.

1.5 SOIL STOCKPILING FACILITIES

.1 Provide, maintain, and operate storage/stockpiling facilities as required.

.2 Install liner below proposed stockpile locations to prevent contact between stockpile material and ground. Equip facility with tarps capable of covering stockpiled material until NCC Representative advises Contractor to dispose of material off site.

1.6 WASTEWATER STORAGE TANK

.1 Provide, operate, and maintain wastewater storage tanks to store wastewaters.

1.6 WASTEWATER STORAGE TANK (Cont'd)

.2 Store wastewaters from dewatering operations in wastewater storage tank.

.3 Discharges: comply with applicable discharge limitations and requirements; do not discharge wastewaters to site sewer systems that do not conform to or are in violation of such limitations or requirements; and obtain NCC Representative's approval prior to discharge of wastewater.

.4 Provide pumps and piping to convey collected wastewaters to designated wastewater storage tanks; provide wastewater storage tanks with minimum total live capacity such that effluent quality can be analyzed and approved prior to discharge to sanitary sewer system.

.5 Connect pumps, piping, valves, miscellaneous items, and necessary utilities as required for operation of facilities; and protect tanks, valves, pumps, piping, and miscellaneous items from freezing.

.6 Do not operate wastewater storage tanks until inspected and approved by NCC Representative.

.7 Notify NCC Representative 72 hours minimum in advance of when wastewater storage tank is anticipated to be full.
.1 Do not discharge additional liquids to filled tank following sampling by Contractor.

.8 Transport and dispose of wastewaters at off-site disposal facility as identified by Contractor and approved by NCC Representative in accordance with Section 02 61 00.01 - Soil Remediation.

.9 Payment for transporting and disposing of wastewater to off-site disposal facility will be determined in accordance with Section 02 61 00.01 - Soil Remediation.

1.7 VEHICULAR ACCESS AND PARKING

.1 Maintenance and Use:

.1 Prevent contamination of access roads. Immediately scrape up debris or material on access roads which is suspected to be contaminated as determined by NCC Representative; transport and place into designated area approved by NCC Representative. Clean access roads at least once per shift.

.2 NCC Representative may collect soil samples for chemical analyses from traveling surfaces of constructed and existing access routes prior to, during, and upon completion of Work. Excavate and dispose of clean soil contaminated by Contractor's activities at no additional cost to NCC Representative.

1.8 DUST AND PARTICULATE CONTROL

.1 Execute Work by methods to minimize raising dust from construction operations.

.2 Implement and maintain dust and particulate control measures as determined necessary by NCC Representative during construction and in accordance with Province of regulations.

.3 Provide positive means to prevent airborne dust from dispersing into atmosphere. Use potable water for water misting system for dust and particulate control.

.4 Use chemical means for water misting system for dust and particulate control only with NCC Representative's prior written approval.

.5 As minimum, use appropriate covers on trucks hauling fine or dusty material. Use watertight vehicles to haul wet materials.

.6 Prevent dust from spreading to adjacent property sites.

.7 NCC Representative will stop work at any time when Contractor's control of dusts and particulates is inadequate for wind conditions present at site, or when air quality monitoring indicates that release of fugitive dusts and particulates into atmosphere equals or exceeds specified levels.

1.8 DUST AND PARTICULATE CONTROL (Cont'd)

.8 If Contractor's dust and particulate control is not sufficient for controlling dusts and particulates into atmosphere, stop work. Contractor must discuss procedures that Contractor proposes to resolve problem. Make necessary changes to operations prior to resuming excavation, handling, processing, or other work that may cause release of dusts or particulates.

1.9 POLLUTION CONTROL

.1 Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious toxic substances and pollutants produced by construction operations.

.2 Be prepared to intercept, clean up, and dispose of spills or releases that may occur whether on land or water. Maintain materials and equipment required for cleanup of spills or releases readily accessible on site.

.3 Promptly report spills and releases potentially causing damage to environment to:
.1 Urgence-Environnement at 1-866-694-5454 (24/7 service).
.2 Environment Canada at 1-800-363-4735.
.3 Authority having jurisdiction or interest in spill or release including conservation authority, water supply authorities, drainage authority, road authority, and fire department.
.4 Owner of pollutant, if known.
.5 Person having control over pollutant, if known.
.6 NCC Representative.

.4 Contact manufacturer of pollutant if known and ascertain hazards involved, precautions required, and measures used in cleanup or mitigating action.

.5 Take immediate action using available resources to contain and mitigate effects on environment and persons from spill or release.

1.9 POLLUTION CONTROL (Cont'd)

.6 Provide spill response materials including, containers, adsorbent, shovels, and personal protective equipment. Make spill response materials available at all times in which hazardous materials or wastes are being handled or transported. Spill response materials: compatible with type of material being handled.

1.10 EQUIPMENT DECONTAMINATION

.1 Commence Work involving equipment contact with potentially contaminated material only after Equipment Decontamination Facility is operational.

.2 Decontaminate equipment after working in potentially contaminated work areas and prior to subsequent work or travel on clean areas.

.3 Perform equipment decontamination on existing equipment decontamination pad.

.4 At minimum, perform following steps during equipment decontamination: mechanically remove packed dirt, grit, and debris by scraping and brushing without using steam or high-pressure water to reduce amount of water needed and to reduce amount of contaminated rinsate generated. Use high-pressure, low-volume, hot water or steam supplemented by detergents or solvents as appropriate and as approved by NCC Representative. Pay particular attention to tire treads, equipment tracks, springs, joints, sprockets, and undercarriages. Scrub surfaces with long handle scrub brushes and cleaning agent. Rinse off and collect cleaning agent. Air dry equipment in Clean Zone before removing from site or travelling on clean areas. Perform assessment as directed by NCC Representative to determine effectiveness of decontamination.

1.10 EQUIPMENT DECONTAMINATION (Cont'd)

.5 Maintain inspection record on site which includes: equipment descriptions with identification numbers or license plates; time and date entering decontamination facility; time and date exiting decontamination facility; and name of inspector with comment stating that decontamination was performed and completed.

.6 Each piece of equipment will be inspected by NCC Representative after decontamination and prior to removal from site and/or travel on clean areas. NCC Representative will have right to require additional decontamination to be completed if deemed necessary.

.7 Take appropriate measures necessary to minimize drift of mist and spray during decontamination including provision of wind screens.

.8 Collect decontamination wastewaters and sediments which accumulate on equipment decontamination pad. Transfer wastewaters to designated wastewater storage tank.

.9 Transfer sediments to disposal transport vehicle.

.10 Furnish and equip personnel engaged in equipment decontamination with protective equipment including suitable disposable clothing, respiratory protection, and face shields.

.11 Have on hand sufficient pumping equipment, of adequate pumping capacity and associated machinery and piping in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment. Maintain piping and connections in good condition and leak-free.

1.11 WATER CONTROL

.1 Maintain excavations free of water.

.2 Protect site from puddling or running water. Grade site to drain.

1.11 WATER CONTROL (Cont'd)

.3 Prevent surface water runoff from leaving work areas.

.4 Do not discharge decontaminated water, or surface water runoff, or groundwater which may have come in contact with potentially contaminated material, off site or to municipal sewers.

.5 Prevent precipitation from infiltrating or from directly running off stockpiled waste materials. Cover stockpiled waste materials with an impermeable liner during periods of work stoppage including at end of each working day and as directed by NCC Representative.

.6 Direct surface waters that have not contacted potentially contaminated materials to existing surface drainage systems.

.7 Control surface drainage including ensuring that gutters are kept open, water is not directed across or over pavements or sidewalks except through approved pipes or properly constructed troughs, and runoff from unstabilized areas is intercepted and diverted to suitable outlet.

.8 Dispose of water in manner not injurious to public health or safety, to property, or to any part of Work completed or under construction.

.9 Provide, operate, and maintain necessary equipment appropriately sized to keep excavations, staging pads, and other work areas free from water.

.10 Contain water from stockpiled wastematerials. Transfer potentially contaminated surface waters to wastewater storage tanks separate from wastewater from Personnel Hygiene/Decontamination Facility.

.11 Have on hand sufficient pumping equipment, machinery, and tankage in good working condition for ordinary emergencies, including power outage, and competent workers for operation of pumping equipment.

1.11 WATER CONTROL (Cont'd)

.12 Contain and collect wastewaters and transfer such collected wastewaters to Contractor - supplied wastewater storage tanks.

1.12 DEWATERING

.1 Dewater various parts of Work including, without limitation, excavations, structures, foundations, and work areas.

.2 Employ construction methods, plant procedures, and precautions that ensure Work, including excavations, are stable, free from disturbance, and dry.

.3 Dewatering Methods: includes sheeting and shoring; groundwater control systems; surface or free water control systems employing ditches, diversions, drains, pipes and/or pumps; and other measures necessary to enable Work to be carried out in dry conditions.

.4 Provide sufficient and appropriate labour, plant, and equipment necessary to keep Work free of water including standby equipment necessary to ensure continuous operation of dewatering system.

.5 Take precautions necessary to prevent uplift of structure or pipeline and to protect excavations from flooding and damage due to surface runoff.

.6 Test and analyze water generated from dewatering activities and treat to meet required discharge or disposal criteria.

1.13 EROSION AND SEDIMENT CONTROL

.1 Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas, from stockpiles, staging areas, and other work areas. Prevent erosion and sedimentation.

1.13 EROSION AND SEDIMENT CONTROL (Cont'd)

.2 Minimize amount of bare soil exposed at one time. Stabilize disturbed soils as quickly as practical. Strip vegetation, regrade, or otherwise develop to minimize erosion. Remove accumulated sediment resulting from construction activity from adjoining surfaces, drainage systems, and water courses, and repair damage caused by soil erosion and sedimentation as directed by NCC Representative.

.3 Provide and maintain temporary measures which may include, silt fences, hay or straw bales, ditches, geotextiles, drains, berms, terracing, riprap, temporary drainage piping, sedimentation basins, vegetative cover, dikes, and other construction required to prevent erosion and migration of silt, mud, sediment, and other debris off site or to other areas of site where damage might result, or that might otherwise be required by Laws and Regulations. Make sediment control measures available during construction.

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

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

.6 Net Backing: industrial polypropylene mesh joined to geotextile at both top and bottom with double stitching of heavy-duty cord, with minimum width of 750 mm.

1.13 EROSION AND SEDIMENT CONTROL (Cont'd)

.7 Posts: sharpened wood, approximately 50 mm square, protruding below bottom of geotextile to allow minimum 450 mm embedment; post spacing 2.4 m maximum. Securely fasten each post to geotextile and net backing using suitable staples.

.8 Plan construction procedures to avoid damage to work or equipment encroachment onto water bodies or drainage ditch banks. In event of damage, promptly take action to mitigate effects. Restore affected bank or water body to existing condition.

.9 Installation:

.1 Construct temporary erosion control items as indicated. Actual alignment and/or location of various items as directed by NCC Representative.

.2 Do not construct bale barriers and silt fence in flowing streams or in swales.

.3 Check erosion and sediment control measures weekly after each rainfall; during prolonged rainfall check daily.

.4 Bales and/or silt fence may be removed at beginning of work day, replace at end of work day.

.5 Whenever sedimentation is caused by stripping vegetation, regrading, or other development, remove it from adjoining surfaces, drainage systems, and watercourses, and repair damage as quickly as possible.

.6 Prior to or during construction, NCC Representative may require installation or construction of improvements to prevent or correct temporary conditions on site. Improvements may include berms, mulching, sediment traps, detention and retention basins, grading, planting, retaining walls, culverts, pipes, guardrails, temporary roads, and other measures appropriate to specific condition. Temporary improvements must remain in place and in operation as necessary or until otherwise directed by NCC Representative.

.7 Repair damaged bales, end runs, and undercutting beneath bales.

1.13 EROSION AND SEDIMENT CONTROL (Cont'd)

.9 (Cont'd)
.8 Unless NCC Representative, remove temporary erosion and sediment control devices upon completion of Work. Spread accumulated sediments to form a suitable surface for seeding or dispose of, and shape area to permit natural drainage to satisfaction of NCC Representative. Materials once removed become property of Contractor.

.10 Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

.11 Do not disturb existing embankments or embankment protection.

.12 Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

.13 If soil and debris from site accumulate in low areas, storm sewers, roadways, gutters, ditches, or other areas where in NCC Representative's determination it is undesirable, remove accumulation and restore area to original condition.

1.14 PROGRESS CLEANING

.1 Maintain cleanliness of Work and surrounding site to comply with federal, provincial, and local fire and safety laws, ordinances, codes, and regulations.

.2 Co-ordinate cleaning operations with disposal operations to prevent accumulation of dust, dirt, debris, rubbish, and waste materials.

1.15 FINAL DECONTAMINATION

.1 Perform final decontamination of construction facilities, equipment, and materials which may have come in contact with potentially contaminated materials prior to removal from site.

1.15 FINAL DECONTAMINATION (Cont'd)

.2 Perform decontamination as specified to satisfaction of NCC Representative. NCC Representative will direct Contractor to perform additional decontamination if required.

1.16 REMOVAL AND DISPOSAL

.1 Remove surplus materials and temporary facilities from site.

.2 Dispose of non-contaminated waste materials, litter, debris, and rubbish off site.

.3 Do not burn or bury rubbish and waste materials on site.

.4 Do not dispose of volatile or hazardous wastes such as mineral spirits, oil, or paint thinner in storm or sanitary drains.

.5 Do not discharge wastes into streams or waterways.

.6 Dispose of following materials at appropriate off-site facility identified by Contractor and approved by NCC Representative:
.1 Debris including excess construction material.
.2 Non-contaminated litter and rubbish.
.3 Disposable PPE worn during final cleaning.
.4 Wastewater removed from wastewater storage tank.
.5 Wastewater generated from final decontamination operations including wastewater storage tank cleaning.
.6 Lumber from decontamination pads.

.7 Dispose of materials as directed by NCC Representative.

1.16 REMOVAL AND DISPOSAL (Cont'd)

.8 Wastewater sample and analysis: NCC Representative will perform sampling and analysis of stored wastewater for disposal purposes prior to removal from site. Results of analyses will determine appropriate methods of disposal. Upon receipt of analytical results, transfer tank contents without spills or release, as directed by NCC Representative. Following completion of tank emptying, decontaminate tank interior with steam or high-pressure water wash supplemented by detergent. Dispose of tank decontamination water with tank contents.

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

.10 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.

1.17 RECORD KEEPING

.1 Maintain adequate records to support information provided to NCC Representative regarding exception reports, annual reports, and biennial reports.

.2 Maintain asbestos waste shipment records for minimum of 3 years from date of shipment or longer period required by applicable law or regulation.

.3 Maintain bills of ladings for minimum of 375 days from date of shipment or longer period required by applicable law or regulation.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

END OF SECTION

1 Related Sections

.1 Section 01 33 00 - Submittal procedures

2 References

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

.2 Province of Québec
.1 Loi sur la santé et la sécurité du travail, L.R.Q., c. S-2.1 and the corresponding regulations.

.3 CSA S269.1-1975 Falsework for Construction Purposes.

.4 CAN/CSA-S269.2-M87 Access Scaffolding for construction Operations.

.5 FCC No. 301-1982 Standard for Construction Operations.

3 Submittals

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

.2 Submit site-specific Health and Safety Plan: Within 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.

.3 Submit two (2) copies of Contractor's authorized representative's work site health and safety inspection reports to NCC Representative.

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

.5 Submit copies of incident and accident reports.

.6 Submit Material Safety Data Sheets (MSDS) to NCC Representative.

.7 NCC Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 days after receipt of plan. Revise plan as appropriate and resubmit plan to NCC Representative within 5 days after receipt of comments from NCC Representative.

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

.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 NCC Representative.

4 Filing of Notice

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

5 Safety Assessment

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

6 Meetings

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

7 General Requirements

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

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

8 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.

9 Compliance Requirements

.1 Comply with Quebec and Ontario Health and Safety Act and Regulations for Construction Projects.

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

10 Unforeseen Hazards

.1 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, and follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction. Advise NCC Representative verbally and in writing.

11 Posting of Documents

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

12 Correction of Non-Compliance

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

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

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

13 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.

14 Construction Safety Measures

.1 Observe construction safety measures of National Building Code 1995 Part 8, Provincial Government, Workers'/Workmen's Compensation Board and municipal authority provided that in any case of conflict or discrepancy more stringent requirements shall apply.

.2 Comply with requirements of FCC No. 301.

15 WHMIS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of

hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

.2 Deliver copies of WHMIS data sheets to NCC Representative on delivery of materials.

16 Overloading

.1 Ensure no part of Work is subjected to loading that will endanger its safety or will cause permanent deformation.

17 Falsework

.1 Design and construct falsework in accordance with CSA S269.1.

18 Scaffolding

.1 Design and construct scaffolding in accordance with CSA S269.2

END OF SECTION

PART 1 – GENERAL

1.1 Fires

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

1.2 Disposal of Wastes

.1 Do not bury rubbish and waste materials on site.

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

1.3 Drainage

.1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.4 Site Clearing and Plant Protection

.1 Protect trees and plants on site and adjacent properties where indicated.

.2 Wrap in burlap, trees and shrubs adjacent to construction work, storage areas and trucking lanes, and encase with protective wood framework from grade level to height of 2 m.

.3 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. Minimise stripping of topsoil and vegetation.

.4 Implement the cutting of vegetation and trees (deforestation) before April 15 to avoid the bird nesting period. Restrict tree removal to areas indicated or designated by Engineer.

.5 Any tree larger than 10 cm of DHP which could be damaged by the equipment during construction shall be protected by putting in place the protection measures shown in standard NQ 0605-100/2001 of Bureau de normalisation du Québec at Part IX: *conservation des arbres et des arbustes lors de travaux d'aménagement et de construction* (available free: http://www-es.criq.qc.ca/pls/owa_es/ncw_enaltquete_publique.liste_promo?p_lang=fr)

.6 Do not degrade/alter the vegetation surrounding the intervention zones in particular the mature trees;

install protection structures as needed. Implement tree cutting so to not damage forest edge and avoid them falling to the exterior of deforestation limit or towards watercourse.

7. Branches susceptible to be damaged shall be protected or trimmed. Roots to be trimmed shall be done clean and exposed roots shall be kept wet during the full duration of construction. No tree shall be used as support during works. Tree trunk at risk to be damaged shall be protected with wood pieces disposed on rubber bands.

1.5 Pollution Control

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

.2 Control emissions from equipment and plant to local authorities emission requirements.

.3 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.

.4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads, construction site and roads during construction.

.5 Environmental Emergency Plan: An Environmental Emergency Plan (EEP) shall be prepared by the Contractor which outlines a spills response procedure and any other procedures required to deal with potential emergencies. Hence, in the event of a spill, the contractor shall immediately clean up any spills of contamination, water or other substances which may be either detrimental to marine or terrestrial life or quality of surface water, groundwater or soil in accordance with the appropriate federal and provincial guidelines/regulations. If a leak or a problem is detected, corrective measures shall be implemented and maintenance of defective equipment or vehicle shall be executed immediately and at least than 60 meters of any waterways. The contractor will have on site spill containment equipment. The contractor shall notify all appropriate provincial and federal agencies as required by law and the NCC Representative. Prior to construction, the contractor is required to provide a Spills Response Plan, which will provide specific details on spill management for the project.

.6 Comply to conditions and to mitigation measures described in Authorization Certificate of du ministère du Développement durable, de l'Environnement et de la Lutte contre les changements climatiques (MDDELCC) obtained by NCC in

virtue of Article 22 of the *Loi sur la qualité de l'environnement* (L.Q.E).

.7 Comply to conditions of permit from City of Gatineau obtained by NCC as well to law and rules dispositions related to permit. As required by municipal regulations, limit construction work and material transport to normal working hours, between 7 h AM et 7 h PM from Monday to Friday and from 8 h AM to 5 h PM on Saturday. They are not allowed Sundays and holidays, unless there have been an agreement approved by local authorities (Regulation no. 44-2003 City of Gatineau).

1.6 Works adjacent to Waterways

.1 It is forbiden to circulate with machinery in the creek and swamps.

.2 When equipment is not used, get it out of protected shoreline 15 m away from watercourse.

.3 Reduce to the minimum the removal of the vegetation on creek shorelines. Creek shorelines shall be restored to their original condition if they were disturbed by the construction or excavation.

.4 Do not use waterway beds for borrow material.

.5 Do not dump excavated fill, waste material or debris in waterways. All debris introduced accidentally in watercourse shall be removed as early as possible.

.6 No debris shall be accumulated at less that 30 m from lake or watercourse. Localise a temporary depot on site and re-instate the site at its original condition at the end of construction works. Provide site with proper necessary amenities (portable chemical toilets, garbage cans, bins, etc) to prevent any debris dispersion in the environment.

.7 Recuperate and dispose of garbage and debris in conformity with regulations in force. Transport contaminated materials and soils at authorized dumping sites.

.8 Washing of concrete delivery trucks and other equipment used for concrete mixing shall not be done at least than 30 meters from waterways or a humid zone. Washing shall be done off construction site. All concrete delivery trucks shall recuperate their rinsing water and recycle it in view of its elimination off site at a site respecting all regulated requirements.

.9 Concrete shall be mixed off site or prepared on protected surfaces if small quantities are required (for example: minor repairs). Non-used concrete shall be also disposed at a site respecting all regulated requirements.

.10 Any intervention in water shall be done out of periods sensitive for the ichthyan species present in waterways (ex. Between April 1st and July 15) to protect the sensitive period in aquatic environment. According the list of species in peril in Canada (référer à www.sararegistry.gc.ca), following species of fishes and turtle are present in the area: Channel Darter (threatened status), River Redhorse (special concern status), Northern Brook Lamprey (special concern status), and Northern Map Turtle (special concern status). Also present the Large Northern Pike, Yellow Perch, Large Mouth Bass and Muskies

.11 At all times insure the free flow of water current and sufficient water quantity to maintain proper functionality of fish habitat (feeding, stocking, spawning) upstream and downstream of the construction zone. Limit the cumulative footprint of temporary works to one third of the width of waterway measured from the natural high water line so to restrain the speed of current flow by the flow restriction and so impede the free flow of fishes or create erosion problem.

.12 Take necessary measures to avoid all impacts (ex. Flooding, land emergence, matters in suspension, erosion, etc) upstream and downstream of the construction zone.

.13 Stabilize soils in intervention zones where there are erosion risks particularly in proximity of waterways.

.14 The cofferdam shall be made of materials easily retractable (example: sheet piles, concrete blocks or other types equivalent approved by NCC Representative) which limits to a minimum the impediments on fish habitat, shall be supervised by a qualified environment professional who shall put in place a efficient scare away plan for fishes, and shall be put in place progressively as to allow fish to escape which risk to be locked into the enclosed space – refer to Section 35 20 22 Dewatering and cofferdams. If it is not possible to avoid fishes being trapped in enclosed space, recuperate delicately all the captive fishes in the confined or isolated zones of construction site and put them back in the waterway in a sector favoring its survival so to avoid fish death. A permit in virtue of the Species at Risk Act should be necessary if the Channel Darter is present in the confined or isolated zones of construction site, this at the cost of Contractor.

.15 Design, install and stabilize the temporary works (shoring, cofferdams, etc) so to resist to flooding susceptible during the construction period and to avoid erosion problem to shoreline of river bed.

.16 The key of the protection rip-rap shall be embedded 15 to 20 centimeters under the creek bed so to encourage the substratum deposition favorable to implant of aquatic herbals.

.17 Works for the demolition of the exsiting bridge shall be done form the shoreline, i.e. no temporary impediment will be allowed. Barges could be used. Existing piers shall be dismantled partially without touching the creek waterway.

1.7 Special requirements

.1 Contractor shall respect all measures required to protect fishes and their habitat during the construction by referring to and respecting recommendations of Operational Statements of Department of Fish and Oceans for the short span bridge as described on web site http://www.dfo-mpo.gc.ca/habitat/what-quoi/os-eo/qc/pdf/span-eng.pdf. However crossings of waterways are not allowed on this project. The alternative is the crossing on the nearby bridge on Fournier Boulevard.

Special attention shall be carried for the construction and cleaning due to sensitive nature of environment and the permanence of traces or damage on its surface.

.2 Preventive and control measures of erosion and sediments in running water, as the maintenance of existing vegetation and the installation of silt curtains or of geotextile membranes, shall be installed appropriately to circle the construction site so to avoid any matter in suspension before entering into the watercourse and these measures shall stay in place until construction work completion. As needed, these devices shall be maintained (cleaning or replacement) so to insure their maximum efficiency, and this until the growth of vegetation. Orientate running water so it avoids zones sensitive to erosion, notably the zones affected by construction works.

.3 Silt turbidity curtains shall be installed along the existing and future abutments and wingwalls and in front of the cofferdams so to avoid any dispersion of matters in suspension into the watercourse. Deploy them in a manner to avoid trapping the fishes inside the closing area.

.4 A floating platform if necessary shall be used for construction works under the bridge. Tarps or nets

shall be placed on platforms so to recuperate all construction debris – refer to 1.7.14..

.5 Stabilize the residual matters excavated from site so they wil not be disperse in watercourse. It shall include covering of depot materials with a net or biodegradable tarp or the planting of plants or bushes, indigenous of preference, on top of it.

.6 Maintain in good condition all the works protecting the environment.

.7 Avoid any storing of excavation materials in the zones having mention for species at particular status. It is forbidden to store fine and friable materials (clay, sand, concrete) at the proximity of watercourse so to avoid it washing; when present, remove these materials from site as fast as possible. By taking necessary precautions, avoid transporting fine particles in the aquatic environment outside of immediate work area.

.8 Stabilize all disturbed areas, particularly sloped embankments, as work is progressing. If delay is necessary for a permanent stabilization, control and protection erosion measures shall remain in place to prevent erosion and capture any eroded material.

.9 No earthwork or excavation shall be executed near watercourse during flooding periods or heavy rains. Avoid circulating and proceeding with excavation works when it rains heavily or during flooding.

.10 Take all necessary precautions so to avoid soil erosion during temporary closure of construction site.

.11 Limit to strict minimal clearing, scouring, excavation, earth works and levelling in the working areas. Limit to strict minimal the areas and depths of excavation.

.12 All temporary works shall be protected for eroding with proper stabilization, with the help of adequate geotextile membrane or rip-rap. In addition, they shall be built to resist flooding that could occur during construction works.

.13 All construction activities shall in the area ultimately covered by the bridge, including transport of materials, installation, cleaning, etc.

.14 Construction debris or materials shall not fall into creek. Reduce to the minimum the removal on natural debris made of wood, stone, sand or other materials coming from shore, shoreline or creek bed under the HWL. Insure that all the works done into water or on structures being into the water do not obstruct the passage of fishes and do not reduce the width of waterway neither its flow. Install a platform or

nets under the bridge deck to capture debris and diminish the risk of debris falling in the watercourse. Nets for protection/recuperation shall be used under the bridge to recuperate all debris or material during the construction. All construction debris shall be transported off-site at contractor's costs; no debris shall be burnt or dig into ground.

.15 All tools and equipment shall be filled up at a distance of more than 60 m from the creek; all vehicles shall be filled up with gas and oil out of site totally. Any spilling of petroleum products shall be reported to site inspector and a clean-up shall be immediately done by Contractor as per instructions of NCC Representative.

.16 Motorized equipment shall not cross the river bed. Passage in river at low water level is not allowed. Motorized equipment shall pass by the bridge on Fournier Boulevard located between the two entrances to the construction site.

.17 Do not store and manipulate oil or gas within 60m of the natural high water line of watercourse.

.18 Ensure that all heavy machinery is washed before it's use and entering on site, at more than 30 m of the natural high water line of the Ottawa river, in order to limit all deposit of grease or oil within the work area; the contractor is to use machinery and equipment in good working order and showing no oil leaks.
If an oil leak or problem is detected, corrective measures shall be taken and cleaning of machinery or defective machineries shall be done immediately and at least 60 meters of any watercourse.

.19 Proceed with inspection of materials (machineries and equipments) before its introduction on site. Maintain the material in perfect condition and verify daily the presence of contaminant leaks. In case of leak/breakage, the material shall be repaired immediately or be excluded from site. Frequent inspections of heavy machinery and equipment will have to be done to ensure good working order (particularly the exhaust system) and to detect leaks of fuel, oil, grease, etc. Proper corrective measures will have to be taken and maintenance done immediately if a problem is detected.

.20 Shut off any motorized equipment used on site when not used. Do not let motors idling and do not allow the use of generators at least than 2 m from branches and trees. Do not let motors function at night unless indicated otherwise from the NCC Representative's approval.

.21 Use as small equipment as possible. Limit travelling of equipment and machinery.

.22 Following completion of construction, seeds and fertilizers shall be spread as soon as possible to help prevent erosion.

.23 Restrain only vehicular traffic to proposed roadways that shall be identified clearly as shown on drawings. Identify clearly the zones authorized for the machinery traffic. Confine machinery traffic in identified access roads and privileged ways within the intervention zones; machinery traffic is forbidden outside these zones.

.24 If cutting works in vegetation shall be done during nesting period of migratory birds, a biologist shall do a reconnaissance of work areas to locate active nests so to avoid to disrupt migratory birds during the nesting period (from May 1st to August 31st).

.25 If possible, use equipment with noise reducing devices. Install equipment fixed at locations less sensitive to noise. Install as needed temporary acoustic screens so to reduce noise emanating from construction site.

.26 Following measures shall be applied to preserve the quality of surface water:

.1 Execute works below high water level during the period recommended by DFO for the protection of fish habitat, i.e. from 16th July to 31st of March;

.2 A special attention shall be bare on all works executed in aquatic environment so to limit sediments in suspension during the spawning of possible other fish species;

.3 Insure at all times the free water flow and a sufficient quantity of water to maintain the functionality of fish habitat (feeding, nursery, spawning) upstream and downstream of the construction area. Take necessary measures to avoid impacts upstream and downstream of the construction area (i.e. flooding, dryness, matters in suspension, erosion, etc).

.4 No concrete shall be fabricated directly on construction site. All concrete necessary for the execution of construction shall be delivered by concrete trucks or other transport means.

.5 Clean washing of concrete trucks and other equipment used to mix concrete shall not be done at least 30 m from waterways and outside the construction site.

.6 Unused concrete shall be also disposed to an authorized dump site.

.27 Install protection fences on ground around trees located nearby the construction site so to not damage their root system. These fences shall be installed at the vertical limit of tree crown to be protected.

.28 Avoid any storage of excavated materials in zones with mention of particular status species.

.29 Except for tree shown on drawings, trees (with outside diameter larger than 10cm) shall not be cut. If cutting of trees with outside diameter larger than 10cm is required, an authorization from *Section for Management of natural resources and of land of NCC Gatineau Park* shall to be obtained by Contractor.
These cut trees shall be replaced in a ratio 2 for 1 with non invading species and indigenous in Gatineau park approved by Park biologists. Contractor shall get his plantation plan approved by NCC Representative before the planting of trees.

.30 Limit cut of vegetation (diameter at trunk level smaller than 10 cm) to strict minimum, i.e. vegetation impeding access of machinery and construction work. Locate properly the areas to deforest with adequate visual markers and indicate deforestation limit on working drawings.

.31 Execute pruning according following rules :
1. Use pruning-scissors or a pruning saw preferably;
2. The best to prune a branch is at collar level (bark rim located at 2 to 3 cm from base of branch);
3. Avoid pruning at the base of branches so to not create a large scar;
4. Cut out at angle to avoid water infiltration or accumulation in the cut limb surface;
5. Cut out in sections of 1 metre long maximum;
6. Disperse branches in nearby forest, with caution to not damage smaller trees which regenerate the glades.

.32 Fauna on site shall not be hunted, harassed or tracked down.

.33 All debris shall be collected and eliminated each day, or stocked in safe containers to prevent garbage effects on consuming animals. All motorized vehicles and machinery shall stay in the designated road or pathways to avoid perturbing the fauna habitat.

.34 Residual matters that cannot be recycled, recuperated or re-used shall be disposed in an appropriate site outside of Park in compliance with applicable requirements of MDDELCC.

.35 Clean site of all residues. Residual matters on site shall be sorted and, if possible, recycled, recuperated or re-used outside NCC lands. Contractor shall transmit to Gatineau Park biologists (for Park projects) and to NCC Environmental Services a report documenting the volumes and types of materials sorted, recuperated or re-cycled.

.36 Contractor shall remove all fences and temporary signage. Contractor shall remove debris and garbage before closure of construction site.

.37 If excavation works are planned, recuperate the excavated vegetal soil and use it to rehabilitate the site following construction completion.

.38 Clean and remove debris and sediments that obstruct storm sewer drains and dispose of these materials taking care for none falling in watercourse.

.39 Remove debris manually or with help of machinery used from the shoreline or from floating dam.

.40 Watercourse bed as well as its shorelines shall be re-instated to their natural condition.

.41 Contractor shall be responsible for the re-instatement of all degraded areas of fauna habitat within the vicinity of site.

.42 Re-instate to original condition all damaged ditches by machinery (damage to drainage slope, shoulders of embankments, etc).

.43 Re-instate to original condition shorelines using known vegetal stabilization technologies which consider stability, erosion sensitivity, slope and height of embankment. Vegetalization works shall be done as soon as possible following earthwork completion by privileging indigenous species in Gatineau Park.

.44 Re-instate site with vegetal soil and seed with mix approved by Engineer as follows (percentages may vary, substitutions shall be approved) :

- For fields and road shoulders:
  - 50% *Phleum pratense* (Phléole des près);
  - 25% *Poa trivialis* (Pâturin rude);
  - 10% *Agrostis alba* (Agrostide blanche);
  - 8% *Trifolium repens* (Trèfle blanc);
  - 7% *Medicago lupulina* (Luzerne lupuline).

.45 An emergency intervention kit and recognized absorbents in sufficient quantity will be available on site to be prepared in case of an accidental hydrocarbon leak (petrol products).

.46 Foresee the implementation and application of an emergency plan in case of an accidental leak of contaminants. Identify properly responsible persons and authorities, as well as the procedures to follow in case of environmental emergency.
In the case of a hydrocarbon leak or any accident which could cause damage to the environment, report immediately to NCC urgency (613-239-5353) and to the Engineer, as well to URGENCE ENVIRONNEMENT QUÉBEC at 1-866-694-5454 or 1-888-626-6663 (extension 32391) and recuperate hydrocarbons and any contaminated

soils by a firm specialized in the field (determined by NCC Representative) once leak is contained.

.47 The Contractor must grant, at any reasonable hour, access to employees from the Ministère des Forêts, de la Faune et des Parcs (MFFP) du Québec and from MDDELCC to the site, in order to ensure that special requirements, listed above, are followed.

.48 A copy of the authorization of the ministry MDDEP and permit from municipality provided by NCC Representative as well as all documents required to execute the work (i.e. drawings and specifications) shall be available on site at all times during construction so that anyone (foreman, inspector, etc.) can consult them.

.49 If the contractor cannot respect one of the above mentioned conditions for any reasons, following uncontrollable events for example, he must contact with the Engineer before starting or proceeding with work so that the latter can analyze the situation and modify the authorization, if necessary.

.50 If human remains are discovered during activities related to project, all works in the affected area shall stop immediately and Contractor shall contact immediately the Engineer and archeologist, NCC Patrimonial Program (Ian Badgley, 613-239-5751). No work shall be done near discovery site of human remains.

.51 Discovery of archeological artifacts during the construction shall require immediate interruption of works at this location until a complete evaluation of site is performed by a qualified archeologist. The regional direction of l'Outaouais du ministère de la Culture, des Communications et de la Condition féminine (819 772-3002) et the Archeologist, NCC Patrimonial Program (613 239-5678 poste 5751) shall be contacted by the Contractor.

.52 Contractor shall pump water accumulating in the cofferdams in a tamper vegetation zone or a decantation basin, this at 30 m from creek before returning pumped water into the waterway so to limit sediment dispersion. Pump shall be installed out of waterways. It includes the installation of sieve at the upstream extremity of pumping conduit and installation of a waterproof membrane (polythene sheet for example) long enough at downstream extremity of pumping conduit to prevent erosion of creek bed and shorelines.

.53 Prior to start of construction, identify on a drawing the location for all filtration devices (sediment barriers/curtains, sedimentation basins, etc) and install them according the plan approved by the NCC Representative. Identify on a drawing the locations where pumped water full of sediments in suspension coming from the isolated zone of the

cofferdams (for the removal of the abutments and construction of the new abutments/walls) and execute according the plan approved by the NCC Representative. In no time this water must not be going in the marshes or directly into the waterway. This water shall be rejected at not less than 30 m from the discharge of Leamy Lake (creek), and this, in an area of small slope. Prior to start of construction, All efficient erosion control measures so to avoid sediments to fall in waterways and latter shall stay in place until completion of works. Inspect works regularly and as needed bring required corrections.

.54 Recuperate and dispose debris according regulations in place. Transport material and contaminated soils in authorized dump sites. Dispose excavated material in an adequate site for this purpose. No debris shall be accumulated at less than 30 meters of waterways. Locate temporary storage site on construction area and re-instate site to its original conditions at the end of construction. Provide on site all necessary equipment (portable chemical toilets, garbage cans, bins, etc) to prevent debris dispersion in the environment. Avoid with all necessary precautions any transportation of fine particles in the aquatic environment outside the immediate construction area. Do not store material or park machinery at less than 30 meters from any waterways (i.e. creeks and their tributaries, humid lands, rivers, lakes and reservoirs).

.55 Transport used oil residue from use of equipment and debris to a site approved to this effect.

.56 Comply to conditions and mitigation measures stipulated in the authorized certificate of Ministère des Ressources naturelles et de la faune (MRNF) obtained by the Commission in virtue of the *Loi sur la conservation et la mise en œuvre de la faune*.

57. Use clean material (exempt of fine particles) for the installation of cofferdam and privilege use of membrane to insure waterproofing of cofferdam.

58. Execute works so to optimize traffic on site and use of material as well as material transport. Limit travelling of machinery and vehicles within the necessary construction areas.

59. Avoid any debris, concrete or wet grout residue in waterways. All debris introduced accidently in waterways shall be removed in the shortest delays.

60. Contractor shall be imposed penalties by local and/or provincial authorities if Contractor does not enforce all required environmental mitigation clauses and measures.

61. Identify as shown on drawings the permitted areas for storage of material of demolition and reconstruction of bridge (refer to Section Construction/Demolition Waste Management and Disposal). Identify on a drawing the areas to be protected without any delay and present the methodologie(s) used (protection mattress, geotextile, rip-rap, etc). The marsh area located west of the bridge shall be prioritized first (refer to Section Construction/Demolition Waste Management and Disposal). The installation of protection fences around the sensitive areas shall be done so to not degrade temporarily or permanently these areas.

62. Determine and use a temporary and isolated storage area on the site for the excavated materials or if necessary for the storage of gas, oil, petroleum products or contaminants. This material shall be stored at a distance of more 60m of waterways and in an area of small slope.

63. If generators are used, insure that gas tank of each has a double shell and is installed on a waterproof surface with a high lip so to avoid any spill.

64. Elaborate a Construction/Demolition Waste Management and Disposal Plan compliant to regulations in place. Avoid rain infiltration in the excavated material and debris stored temporarily by covering them with waterproof tarpaulins during period rains, work stoppages and/or at the end of each working days.

65. Except in the areas or rip-rap, put in place measures so to insure the stability of shorelines and the quick recovery of soil vegetation in the areas of intervention at the end of construction work with plantation of indigenous species approved by the NCC Representative and adapted to the specificities of the site and of regional climate.

66. Execute work of vegetation cutting before April 15 so to avoid the nesting period of birds. According the Law for the migratory birds, no nest of active migratory bird can be disrupted or destroyed. More exactly:

- If the nests containing eggs or fledglings of migratory birds are spotted or discovered during the construction activities, all intrusive activities at the proximity of nesting ground must ceased until the nesting period is completed.
- Any found nest shall be protected with the help of a damper zone based on the protection distance appropriate for the bird species, to the intensity of the disruption and to the surrounding habitat type, and this until the

fledglings have naturally left permanently the nest environment.

- Even if the nest is empty, it shall be preferably left into place, as certain species of migratory birds use them year after year.

67. Considering that a part of the works will take place above the high water line (HWL), the nests of the Northern Map turtle shall be protected (these nests are located at least than 1 m above water level in the soft soil, sandy or in gravel). To this effect, the guidelines of the Ministère des Forêts, de la Faune et des Parcs (MFFP) du Québec shall be applied :
    1. Prior to works and by May 1st at the latest, work site shall be entirely fenced by the Contractor (no turtle shall be found inside the fenced work site).
    2. If there if fauna inside the work area to be fenced, it shall be displaced manually within a nearby appropriate area.
    3. Workers shall be sensibilized to the presence of turtles in the areas of construction site.
    4. If there is nesting at the exterior of the fenced zones: (1) if it is possible, le nesting site shall be protected (no traffic of machinery and screen topping over the nest) – (2) otherwise, eggs shall be displaced manually in a similar nearby environment (according the established protocol: marking of egg orientation, etc)

68. In the eventuality where works reveal the confirmed or suspicious presence of a new individual which is part of a species with particular status, works shall cease and the responsible authorities shall be notified so to take the proper protection measures.

1.8 Methods of construction

.1 Contractor shall use methods of construction approved by MDDELCC and the National Capital Commission.

END OF SECTION

PART 1 - GENERAL

1.1 INSPECTION

.1 Allow NCC Representative and Consultantaccess to Work includding structures. 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 NCC 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 NCC Representative 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, NCC Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by NCC Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by NCC Representative.

.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.

1.2 INDEPENDENT INSPECTION AGENCIES (Suite)

.4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by NCC Representative at no cost to CCN. Pay costs for retesting and reinspection.

1.3 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.

1.4 PROCEDURES

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

.2 Submit samples and/or documents 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.

1.5 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 NCC Representativeas 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.

1.5 REJECTED WORK (Suite)

.3 If in opinion of NCC Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, NCC 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 NCC Representative.

1.6 REPORTS

.1 Submit one print and one electronic copy of inspection and test reports to NCC Representative.

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

1.7 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 NCC Representative and may be authorized as recoverable.

1.8 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.

.2 Construct in locations acceptable to NCC Representativeas specified in specific Section.

.3 Prepare mock-ups for NCC Representative's review with reasonable promptness and in orderly sequence, to not cause delays in Work.

.4 Failure to prepare mock-ups 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.

1.8 MOCK-UPS (Suite)

.5 If requested, NCC Representative will assist in preparing schedule fixing dates for preparation.

.6 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.9 MILL TESTS

.1 Submit mill test certificates as requested.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

FIN DE SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
.1 CCDC 2-1994, Stipulated Price Contract.

.2 Canadian General Standards Board (CGSB)
.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.3 Canadian Standards Association (CSA International)
.1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.2 CSA-0121-M1978(R2003), Douglas Fir Plywood.
.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
.4 CAN/CSA-Z321-96(R2001), Signs and Symbols for the Occupational Environment.

1.2 INSTALLATION AND REMOVAL

.1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.

.2 Identify areas which have to be gravelled to prevent tracking of mud.

.3 Indicate use of supplemental or other staging area.

.4 Provide construction facilities in order to execute work expeditiously.

.5 Indicate zones for which Contractor will not use during the entire project.

.6 Idicate parking areas.

.7 Remove from site all such work after use.

1.3 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2.

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms, and temporary stairs.

1.4 HOISTING

.1 Provide, operate and maintain hoists cranes required for moving of workers, materials, structure and, equipment. Make financial arrangements with Subcontractors for their use of hoists.

.2 Hoists cranes to be operated by qualified operator.

1.5 SITE STORAGE/LOADING

.1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.6 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work.

.2 Provide and maintain adequate access to project site.

.3 Clean pathways and traffic lanes if site equipment was use.

1.7 OFFICES

.1 Provide office conditioned and heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.

.2 Provide marked and fully stocked first-aid case in a readily available location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.7 OFFICES (Suite)

.4 Office of the NCC

.1 Provide temporary office for NCC Representative.

.2 Inside dimensions minimum 5 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with 6-50% opening windows and one lockable door.

.3 Insulate building and provide heating and air conditioning system to maintain 22 degrees C inside temperature from -20 degrees C to +30 degrees C outside temperature.

.4 Finish inside walls and ceiling with plywood, hardboard or wallboard and paint in selected colours. Finish floor with 19 mm thick plywood.

.5 Install electrical lighting system to provide min 750 lx using surface mounted, shielded commercial fixtures with 10 % upward light component.

.6 Provide private washroom facilities adjacent to office complete with flush or chemical type toilet, lavatory and mirror and maintain supply of paper towels and toilet tissue.

.7 The conference room should contain a table and chairs that can accomodate up to 10 people.

.8 Equip office with one desk and one chair with a reference table, 2 three-drawer filing cabinet, one plan rack, a phone, and one coat rack and shelf.

.9 Provide a table for reviewing plans and support plans.

.10 The work area should contain a water cooler, microwave, refrigerator, phone, coat rack and shelf, and high speed Internet connection.

.11 Maintain in clean condition.

1.8 WATER AND ELECTRICITY

.1 Water and electricity are not provide. The connection and water and electricity supply Contractor costs.

1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE

.1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.

1.9 EQUIPMENT, TOOL AND MATERIALS STORAGE (Suite)

.2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.10 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.

.2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.11 CONSTRUCTION SIGNAGE

.1 Provide and erect two project signs, within three weeks of signing Contract, in a location designated by NCC Representative.

.2 Each construction sign 2,4 m x 2,4 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on each sign, name of Owner, Consultant, and Contractor, of design style established by NCC Representative as detailed.

.4 No other signs or advertisements, other than warning signs, are permitted on site.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

.1 Provide access and temporary relocated roads as necessary to maintain traffic.

.2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by NCC Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades, placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs.

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC (Suite)

.4 Protect travelling public from damage to person and property.

.5 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.

.6 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

.8 Haul roads: constructed with suitable grades and widths; sharp curves, blind corners, and dangerous cross traffic shall be avoided.

.9 Provide necessary lighting, signs, barricades, and distinctive markings for safe movement of traffic.

.10 Dust control: adequate to ensure safe operation at all times.

.11 Location, grade, width, and alignment of construction and hauling roads: subject to approval by NCC Representative.

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations,

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, haul roads designated by NCC Representative.

1.13 CLEAN-UP

.1 Remove construction debris, waste materials, packaging material from work site daily.

.2 Clean dirt or mud tracked onto paved or surfaced roadways.

.3 Store materials resulting from demolition activities that are salvageable.

1.13 CLEAN-UP (Suite)

.4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 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.

.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.

FIN DE SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)
.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)
.1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

.3 Tome V - Signalisation routière of the Ministère des Transports du Québec.

1.2 INSTALLATION AND REMOVAL

.1 Provide and install temporary controls in order to execute Work expeditiously.

.2 Remove from site all such work after use.

.3 Protection of existing trees within work site shall be in accordance with section 01 35 43 - Environmental Procedures and section 32 01 90.33 - Trees ans Shrub Preservation.

1.3 TEMPORARY GATES

.1 Install a Modulok fence all around the work site.

.2 Provide one lockable gates as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.3 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around deep excavations.

.2 Provide as required by governing authorities.

1.5 DUST TIGHT SCREENS

.1 Provide dust tight screens or insulated partitions to localize dust generating activities, and for protection of workers, finished areas of Work and public.

.2 Maintain and relocate protection until such work is complete.

1.6 ACCESS TO SITE

.1 Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work.

1.7 PUBLIC TRAFFIC FLOW

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

1.8 EMERGENCY VEHICULE AND FIRE ROUTES

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

1.9 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTYIES

.1 Protect surrounding private and public property from damage during performance of Work.

.2 Be responsible for damage incurred.

1.10 PROTECTION OF FINISHED SUFACES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

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

1.11 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

FIN DE SECTION

PART 1 - GENERAL

1.1 REFERENCES

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

.2 Cost for such testing will be born by NCC Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 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 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.

.3 Should disputes arise as to quality or fitness of products, decision rests strictly with NCC Representative based upon requirements of Contract Documents.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout the project.

.5 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.

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

1.4 STORAGE, HANDLING AND PROTECTION

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

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

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

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

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

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

.7 No piece of steel is to be in contact with the ground directly.

1.4 STORAGE, HANDLING AND PROTECTION (Suite)

.8 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.

.9 Remove and replace damaged products at own expense and to satisfaction of NCC Representative.

.10 Touch-up damaged factory finished surfaces to NCC Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

1.6 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 NCC Representative in writing, of conflicts between specifications and manufacturer's instructions, so that NCC Representative will establish course of action.

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

1.7 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 NCC Representative if required Work is such as to make it impractical to produce required results.

1.7 QUALITY OF WORK (Suite)

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

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

1.8 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.

1.9 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.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

FIN DE SECTION

PART 1 -GENERAL

1.1 Record Drawings

.1 NCC Representative will provide two (2) sets of white paper prints for record drawing purposes.

.2 Maintain project record drawings and record accurately deviations from Contract documents.

.3 Record/mark changes in red on one set of prints and, at completion of project and prior to final inspection, neatly transfer notations to second set and submit both sets to NCC Representative.

.4 Contractor shall inform the NCC Representative of any change before executing the work for the approval by the NCC Representative.

.5 Record field information:
- .1 Field changes of dimension and detail.
- .2 Changes made by Change Order or Field Order.
- .3 Depths of various elements.
- .4 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.

.6 Other project record documents:
- .1 Maintain a record of all other construction documents in an easily accessible (by NCC Representative) format such as:
  1. testing results
  2. product data
  3. telephone and fax numbers of all suppliers, subcontractors and testing agencies and contact persons for each.
- .2 Copies of material tickets for all items paid by unit weight or volume.
- .3 Copies of all correspondence with utilities concerned.
- .4 Updated schedule.
- .5 All NCC Representative's written approvals issued as permission to use alternative equipment, etc.

PART 2 – PRODUCTS

2.1 NO OBJECTS .1 No object.

PART 3 – EXECUTION

3.1 NO OBJECTS .1 No object.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)
   .1 CCDC 2-94, Stipulated Price Contract.

1.2 PROJECT CLEANLINESS

.1 Maintain Work in tidy condition, free from accumulation of waste products and debris, including 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 NCC Representative. Do not burn waste materials on site.

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

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

.5 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.6 Dispose of waste materials and debris.

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

.8 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

1.3 FINAL CLEANING

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

1.3 FINAL CLEANING (Suite)

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

.3 Remove waste products and debris including that caused by Owner or other Contractors.

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

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

.6 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.7 Sweep snd clean Fournier Boulevard when removing detour of the pathway.

.8 Remove dirt and other disfiguration from exterior surfaces.

1.4 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

FIN DE SECTION

PART 1 GENERAL

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with NCC Representative to review and discuss PWGSC's Waste Management Plan and Goals.

.2 PWGSC's Waste Management Goal 75 percent of total Project Waste to be diverted from landfill sites. Provide NCC Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Accomplish maximum control of solid construction waste.

.4 Preserve environment and prevent pollution and environment damage.

1.2 RELATED SECTIONS

.1 01 74 11 – Cleaning

.2 01 35 43 – Environmental Protection

.3 01 33 00 – Submittal Procedures

.4 02 41 16 – Demolition of Structure

1.3 DEFINITIONS

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

.2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, 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 materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. 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. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.4 DOCUMENTS

.1 Maintain at job site, one copy of following documents:

.1 Waste Audit.

.2 Waste Reduction Workplan.

.3 Material Source Separation Plan.

.4 Schedules [A] [B] [C] [D] [E] completed for project.

1.5 SUBMITTALS

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

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

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

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

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

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

.5 Submit 2 copies of Materials Source Separation Program (MSSP) description.

.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 project, include amount in tonnes and the destination.

.4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.6 WASTE AUDIT (WA)

.1 Conduct WA prior to project start-up.

.2 Prepare WA: Schedule A.

.3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

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 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.

.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 Complete DWA: Schedule C.

.3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.9 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Prepare CRAW: Schedule D.

1.10 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

.1 Prepare MSSP and have ready for use prior to project start-up.

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

.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 material[s] in area[s] 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.

1.11 WASTE PROCESSING SITES

.1 With approval from NCC Representative.

1.12 STORAGE, HANDLING AND PROTECTION

.1 Store, materials to be reused, recycled and salvaged in locations as directed by the NCC Representative.

.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 for demolition from movement or damage.

.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify NCC Representative.

.7 Separate and store materials produced during dismantling of structures in designated areas.

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

.1 On-site source separation is recommended.
.2 Remove co-mingled materials to off-site processing facility for separation.
.3 Provide waybills for separated materials.

1.13 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of waste, volatile materials, mineral spirits, oil, paint thinner 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 from deconstruction as deconstruction/disassembly Work progresses.

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

1.14 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises.

.2 Provide temporary security measures approved by NCC Representative.

1.15 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 SELECTIVE DEMOLITION

.1 Reuse of bridge Elements: this project has been designed to result in end of project rates for reuse of bridge elements unless specified otherwise by the NCC Representative, the percentage of existing rip-rap to be reused should not be less than the following:

.1 Existing Rip-Rap: 75 percent.

3.2 APPLICATION

.1 Do Work in compliance with WRW.

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

3.3 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.

3.4 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						
Off-cuts						
Warped Pallet Forms						
Plastic Packaging						
Cardboard Packaging						
Other						

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Doors and Windows Material						
Description						
Painted						
Frames						
Glass						
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	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Material (s) Destina-tion
Wood and Plastics Material Description							
Chutes							
Warped							
Pallet							
Forms							
Plastic Packaging							
Card-board Packaging							
Other							
Doors and Windows Material Description							
Painted							
Frames							
Glass							
Wood							
Metal							
Other							

3.6 DEMOLITION WASTE AUDIT (DWA)

.1 Schedule C - Demolition Waste Audit (DWA):

(1) Material Description	(2) Quantity	(3) Unit	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks and Assumptions
Wood						
Wood Stud						
Plywood						
Baseboard -Wood						
Door Trim - Wood						
Cabinet						
Doors and Windows						
Panel						
Regular						
Slab						
Regular						
Wood						
Laminate						
Byfold - Closet						
Glazing						

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						
Wood Stud						
Plywood						
Baseboard - Wood						
Door Trim - Wood						
Cabinet						
Doors and Windows						
Panel						
Regular						
Slab						
Regular						
Wood						
Laminate						
Byfold - Closet						
Glazing						

3.8 CANADIAN GOVERNMENTAL DEPARTMENTS CHIEF RESPONSIBILITY FOR THE ENVIRONMENT

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

Province	Address	General Inquires	Fax
Alberta	Alberta Environmental Protection Petroleum Plaza, South Tower 9915 - 108 th Street Edmonton AB T5K 2G8	403-427-2739	
	Alberta Special Waste Management Corporation Pacific Plaza, Suite 610 10909 Jasper Avenue NW Edmonton AB T5J 3L9	403-422-5029	403-428-9627
British Columbia	Ministry of Environment Lands and Parks 810 Blanshard Street, 4 th Floor Victoria BC V8V 1X4	604-387-1161	604-356-6464
	Waste Reduction Commission Soils and Hazardous Waste 770 South Pacific Blvd, Suite 303 Vancouver BC V6B 5E7	604-660-9550	604-660-9596
Manitoba	Manitoba Environment Building 2, 139 Tuxedo Avenue, Winnipeg, MB R3N 0H6	204-945-7100	
	The Clean Environment Commission 284 Reimer Avenue, Box 21420 Steinback MB R0A 2T3	204-326-2395	204-326-2472
New Brunswick	Department of the Environment 364 Argyle Street, Box 6000 Fredericton NB E3B 5H1	506-453-3700	506-453-3843
Newfoundland	Department of Environment, Confederation Building, Box 8700 St. John's NF A1B 4J6	709-729-2664	709-729-1930

Province	Address	General Inquires	Fax
Northwest Territories	Department of Renewable Resources Scotia Centre Building, Box 21 5102 - 50 Avenue Yellowknife NT X1A 3S8	403-873-7420	403-873-0114
Nova Scotia	Department of the Environment 5151 Terminal Road, 5th Floor, Box 2107 Halifax NS B3J 3B7	902-424-5300	902-424-0503
Nunavut	Department of Sustainable Development Environmental Protection Service, Box 1000, Station 1195 Iqaluit NU X0A 0H0	867-975-5910	
Ontario	Ministry of Environment and Energy, 135 St. Clair Avenue West Toronto ON M4V 1P5	416-323-4321 800-565-4923	416-323-4682
	Environment Canada Toronto ON	416-734-4494	
Prince Edward Island	Department of Environmental Resources 11 Kent Street, 4th Floor, PO Box 2000 Charlottetown PE C1A 7N8	902-368-5000	902-368-5830
Québec	Ministère de l'Environnement et de la Faune, Siège social 150, boul, René-Lévesque Est Québec QC G1R 4Y1	418-643-3127 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	
Saskatchewan	Saskatchewan Environment and Resource Management 3211 Albert Street Regina SK S4S 5W6	306-787-2700	306-787-3941
Yukon	Yukon Renewable Resources PO Box	403-667-5683	403-667-3641

Province	Address	General Inquires	Fax
	2703 Whitehorse YT Y1A 2C6		

END OF SECTION

PART 1 - GENERAL

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Contractor's Inspection: Contractor conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify NCC Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request NCC Representative's inspection.

.2 NCC Representative's Inspection:

.1 NCC Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in French and English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

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

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

FIN DE SECTION

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Two weeks prior to Substantial Performance of the Work, submit to the NCC Representative, four copies of the final documents required.

1.2 FORMAT

.1 Organize data as instructional manual.

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

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

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

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

.6 Provide, for each category of documents,tab seperator on which must be typed the product description and table of contents.

.7 Text: Printed data or typewritten data from reports.

1.3 CONTENTS - PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;
.1 Date of submission; names.
.2 Addresses, and telephone numbers of Laboratory and Contractor with name of responsible parties.
.3 List of documents indexed to content of volume.

1.3 CONTENTS - PROJECT RECORD DOCUMENTS (Cont'd)

.2 The reports and plans required, with certifications, certificates and other related documentation.

1.4 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Maintain, in addition to requirements in General Conditions, prepare one record copy of:

.1 Weighing tickets from disposal site.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Consider the requirements of the sections 01 74 11 - Cleaning and 01 74 21 - Construction/ Demolition Waste Management and Disposal.

1.2 MEASUREMENT AND PAYMENT

.1 Removal of existing asphalt pavement will be measured in square metres of surface actually removed regardless of depth removed.

.2 Payment under this item will include operations involved in removing, hauling and stockpiling designated pavement, and cleaning of remaining pavement surface.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not used.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Prior to beginning removal operation, inspect and verify with NCC Representative lines of asphalt pavement to be removed.

.2 Protection: Protect from damage existing pavement not designated for removal. If event of damage, immediately replace or make repairs to approval of NCC Representative at no additional cost.

3.2 REMOVAL

.1 Remove existing asphalt pavement to lines and grades as indicated established by NCC Representative in field.

.2 Suppress dust generated by removal process.

3.2 REMOVAL (Suite)

.3 Delineate by cutting at right angles to surfaces which are to remain in place; use a saw or other means approved by NCC Representative.

.4 Protect adjacent joints and granular material underlying or adjacent to the work area.

3.3 FINISH TOLERANCES

.1 Finished surfaces in areas where asphalt pavement has been removed to be within +/-5 mm of grade specified but not uniformly high or low.

FIN DE SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Sections 01 74 11 - Cleaning and 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 REFERENCES

.1 Definitions:

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents,flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.

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

.3 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill.

.4 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials WRW is based on information acquired from WA.

.2 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-2008, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 CSA International

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

.3 Department of Justice Canada (Jus)

1.2 REFERENCES (Suite)

.2 (Suite)
.3 (Suite)
.1 Canadian Environmental Assessment Act (CEAA), 1995, c. 37.
.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.
.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.
.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:
.1 Convene pre-installation meeting 1 week prior to beginning work of this Section and on-site installation, with NCC Representative to:
.1 Verify project requirements.
.2 Verify existing site conditions adjacent to demolition work.
.3 Co-ordination with other construction subtrades.

.2 Scheduling:
.1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion.
.1 In event of unforeseen delay notify NCC Representative in writing.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit in accordance with Section 01 33 00 - Submittal Procedures and Section 01 74 21 Construction/Demolition Waste Management Disposal.

.2 Contactor is responsible for fulfilment of reporting requirements.

.3 Shop Drawings, work method and plans:
.1 Submit for review and approval demolition drawings, work method, diagrams or details showing sequence of demolition work and supporting structures and underpinning.

1.4 ACTION AND INFORMATIONAL SUBMITTALS (Suite)

.3 (Suite)

.2 Submit demolition drawings, breaking method and plans stamped and signed by an engineer licensed by l'Orde des ingénieurs du Québec.

.3 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with authorities having jurisdiction.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements: Ensure Work is performed in compliance with applicable Provincial/Territorial and Municipal regulations.

1.6 SITE CONDITIONS

.1 Environmental protection:

.1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.

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

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not bury rubbish waste materials.

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

.1 Ensure proper disposal procedures are maintained throughout project.

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

.7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.

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

.9 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

1.6 SITE CONDITIONS (Suite)

.1 (Suite)
.10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

1.7 EXISTING CONDITIONS

.1 Structures to be demolished are based on their condition on date that tender is accepted.

PART 2 - PRODUCTS

2.1 EQUIPMENT

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

PART 3 - EXECUTION

3.1 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.
.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.

3.2 DEMOLITION

.1 Do demolition work in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.2 Blasting operations not permitted during demolition.

3.2 DEMOLITION (Suite)

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

.4 Perform required demolition works as per drawings.

.5 Demolish to minimize dusting. Keep materials wetted as directed by NCC Representative.

.6 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.7 Use natural lighting to do Work where possible.
.1 Shut off lighting except those required for security purposes at end of each day.

3.3 CLEANING

.1 Designate appropriate security resources / measures to prevent vandalism, damage and theft.

.2 Dispose of materials in accordance with applicable regulations.
.1 Disposal facilities must be those approved.

FIN DE SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Work Includes:
.1 Provision and installation of materials and equipment necessary to remediate site.
.2 Implementation of safety work zones, site Health and Safety Plans and Emergency Response Plans.
.3 Performance of treatment, control and follow-up.
.4 Management of contaminated waters generated during soil remediation work, including separation, recovery and elimination of free-phase hydrocarbons.
.5 Backfilling of excavations and covering fill with layer of topsoil.

.2 Unit Prices:
.1 Provide disposition costs per additional cubic meter of contaminated groundwater and contaminated soil in the event that additional contaminated materials are found.
.2 Quoted price must include disposition costs for the additional materials.

1.2 REFERENCES

.1 Applicable environmental and health and safety laws, by-laws and regulations for Quebec and City of Gatineau.

.2 CCME (Canadian Council of Ministers of the Environment) Contaminated Sites, Contaminated Soil and Groundwater, and Remediation of Contaminated Sites most current publications.

1.3 DESCRIPTION

.1 Design Requirements:
.1 Ground Water Extraction and Treatment System:
.1 Treats water from excavation and site drainage system.
.2 Extracts free product from wells and trenches.
.3 Pumps as many times volume of contaminated water as necessary to achieve decontamination objectives.

1.3 DESCRIPTION (Cont'd)

.1 (Cont'd)
.1 (Cont'd)
.4 Provides additional storage tanks to hold excess water.
.5 Pumping equipment equipped with auxiliary tanks and emergency shut-down system to avoid risk of spills.
.6 Includes oil/water separator for free-floating phase.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Samples:
.1 Provide samples in accordance with section 01 33 00 - Submittal Procedures as follows.

.3 Quality Assurance and Quality Control Submittals:
.1 Provide Quality Assurance and Quality Control Submittals in accordance with section 01 33 00 - Submittal Procedures as follows:
.1 Description of emergency plans in case of breakdown, spill or other problem.
.2 Waste management plan and complete list of wastes, including waste registration numbers as required by provincial regulations, that will be generated by activities.
.3 Detailed plan of soil and ground water remediation.
.4 Methods that will be used to restore site to its original condition and applicable site criteria as mandated by the Quebec.
.5 Soil and groundwater sampling program.

.4 Closeout Submittals:
.1 Provide Closeout Submittals in accordance with Section 01 78 00 - Closeout Proceduresas follows:
.1 Provide written proof (weigh scale tickets) that contaminated soil has been sent to centre authorized by environmental ministry for Quebec.

1.4 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.4 (Cont'd)
.1 (Cont'd)
.2 Provide written proof that waste and debris have been sent to site authorized by environmental ministry for Quebec or eliminated according to level of contamination.

1.5 QUALITY ASSURANCE

.1 Qualifications:
.1 Identify members of project team including project manager. Define experience, education and training, qualifications, tasks and responsibilities of each team member. Supply résumés of key technical and management staff.

.2 Regulatory Requirements:
.1 Perform work in accordance with:
.1 Acts, Regulations, Laws, guidelines codes of practice, directives and policies of government authorities pertaining to: environment; noise; water supply; waste water; air quality;health and safety; transportation; waste management;.
.2 WHMIS.
.3 Canadian Environmental Assessment Act.
.4 Canadian Environmental Protection Act (New Substance Notification Regulations).
.5 Transportation of Dangerous Goods Act.

.3 Certifications:
.1 Analytical work must be conducted by a certified laboratory and its QA/QC procedures must be explained in detail.
.2 The certification of the Laboratory must be CALA or SSC.

.4 Field Samples:

1.5 QUALITY ASSURANCE (Cont'd)

.4 (Cont'd)
.1 Indicate position of sampling points, sampling method and frequency, number of samples collected, sample preservation and analytical techniques, number of samples analyzed, parameters measured and turnaround time, chain of custody procedures, Quality Control Samples as outlined by provincial regulations.

.5 Pre-proposal meeting:
.1 Attend site meetings and verify site conditions before submitting proposal.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Contaminated Soil:
.1 Store non-contaminated soil excavated by drilling or trenching only on non-contaminated site surface areas. Ensure no contact between non-contaminated excavated soil and drainage or contaminated water or contaminated soil.
.2 Segregate topsoil from non-contaminated and contaminated subsoils.
.3 Prevent compaction of topsoil such that it can be reused during site reinstatement.
.4 Segregate granular materials for reuse in the final excavation.

1.7 SITE CONDITIONS

.1 Existing Conditions:
.1 Review Characterization Report (Appendix summarizing extent of soil and groundwater contamination.
.2 Ensure Characterization Report covers topics: as follows: present and future land use of surrounding area; historical site information; volume and type of contamination; soil stratigraphy including borehole logs and level of contamination.
.3 Contaminated soil removal:
.1 Restore excavated portion with non-contaminated material.

1.8 MAINTENANCE

.1 Access Roads:
.1 Maintain Access Roads

1.8 MAINTENANCE (Cont'd)

.1 (Cont'd)
.1 (Cont'd)
.1 Obtain permission to use existing roads to access site.
.2 Maintain and clean roads for duration of Work.
.3 Repair damage incurred from use of roads.
.4 Provide photographic documentation of roads used by construction vehicles before, during and after Work.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Fill:
.1 Characterized Compactible to meet decontamination objectives.

.2 Hazardous Waste:
.1 Disposed in accordance with provincial regulations.

2.2 EQUIPMENT

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

.2 Trucks:
.1 Cleaned meticulously between loads of contaminated soil and clean fill.
.2 Cleaned meticulously at end of work day.
.3 Cover truck bodies with tarpaulins during transportation.
.4 Use watertight truck bodies for transporting contaminated soil.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Protection:
.1 Keep excavation sites water free throughout work and manage recovered water according to contamination level and provincial and municipal regulations

3.1 PREPARATION (Cont'd)

.1 (Cont'd)
.2 Protect excavation from rainwater.
.3 Provide temporary structures to divert flow of surface waters from excavation.
.4 Provide safety measures to ensure worker and public safety.
.5 Consult NCC Representative regarding potential site specific geotechnical considerations.

3.2 APPLICATION

.1 Soil Management:
.1 Transport and eliminate the contamined soils off-site in accordance with applicable provincial standards, requirements and regulations.
.2 Do not dilute contaminated soil with less contaminated soil.

3.3 RESTORATION

.1 Backfill boreholes and excavations and compact soil to density similar to adjacent natural soil upon completion of groundwater and soil treatment. Ensure confirmatory sampling results indicate that contaminant concentrations are in compliance with applicable provincial standards prior to backfilling.

.2 Re-instate surface grading to give site same appearance as before remediation work.

.3 Clean permanent access roads of contamination resulting from project activity at request of NCC Representative.

END OF SECTION

PART 1 - GENERAL

1.1 PRICE AND PAYMENT PROCEDURE

.1 All Contractor cost for the current section including, but not limited to, costs for supplying formworks, form ties, form liner, formwork installation and formwork removal are include in the price of the element for which formworks are required.

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 O121-08(R2003), Douglas Fir Plywood.

.4 CSA O151-09, Canadian Softwood Plywood.

.5 CSA O153-13, Poplar Plywood.

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

.7 CSA O437 Series-93(R2011), Standards for OSB and Waferboard.

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

.9 CAN/CSA-S269.3-M92(R2013), Concrete Formwork, National Standard of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submittals shop drawings for formwork and falsework.

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

.2 Indicate method and schedule of construction, elevations and dimensions, 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.

1.3 ACTION AND INFORMATIONAL SUBMITTALS (Suite)

.3 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

PART 2 - PRODUCTS

2.1 MATERIALS

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

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

PART 3 - EXECUTION

3.1 FABRICATION AND ERECTION

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

.2 Obtain NCC Representative 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 where necessary.

.5 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.

3.1 FABRICATION AND ERECTION (Suite)

.6 Use 25 mm chamfer strips on external corners and/or 25 mm at joints, unless specified otherwise.

.7 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
.1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes, including painting.

.8 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.
.1 7 days for pile caps.

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

FIN DE SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 American Concrete Institute (ACI)
.1 SP-66-04, ACI Detailing Manual 2004.

.2 ASTM International
.1 ASTM A 82/A 82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
.2 ASTM A 143/A 143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
.3 ASTM A 185/A 185M-07, Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete.
.4 ASTM A 775/A 775M-07b, Standard Specification for Epoxy-Coated Reinforcing Steel Bars.

.3 CSA International
.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
.2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.
.3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
.4 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.6 CSA W186-M1990(R2007), Welding of Reinforcing Bars in Reinforced Concrete Construction.

.4 Reinforcing Steel Institute of Canada (RSIC)
.1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 ACTION AND INFORMATIONAL SUBMITTALS (Suite)

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

.3 Shop Drawings:
.1 Submit drawings stamped and signed by an engineer member of the Ordre des ingénieurs du Québec.
.1 Indicate placing of reinforcement and:
.1 Bar bending details.
.2 Lists.
.3 Quantities of reinforcement.
.4 Sizes, elevations, spacings, locations of reinforcement and mechanical splices if approved by NCC 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 For additional information and notes,refer to the plans.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:
.1 Store materials off ground in accordance with manufacturer's recommendations in clean area.
.2 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by NCC Representative and Consultant.

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

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

.4 Cold-drawn annealed steel wire ties: to ASTM A 82/A 82M.

.5 Deformed steel wire for concrete reinforcement: to ASTM A 82/A 82M.

.6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.7 Mechanical splices: subject to approval of NCC Representative.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 SP-66 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.
.1 SP-66 unless indicated otherwise.

.2 Obtain NCC Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.

.3 Upon approval of NCC Representative, weld reinforcement in accordance with CSA W186.

.4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
.1 Ship epoxy coated bars in accordance with ASTM A 775A/A 775M.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Conduct bending tests to verify galvanized barfragility in accordance with ASTM A 143/A 143M.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by NCC Representative and Consultant.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars, which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings and in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain NCC Representative's approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

3.4 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 recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

FIN DE SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 Abbreviations and Acronyms:

.1 Portland Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement.

.1 Type GU, GUb and GUL - General use cement.

.2 Type MS and MSb - Moderate sulphate-resistant cement.

.3 Type MH, MHb and MHL - Moderate heat of hydration cement.

.4 Type HE, HEb and HEL - High early-strength cement.

.5 Type LH, LHb and LHL - Low heat of hydration cement.

.6 Type HS and HSb - High sulphate-resistant cement.

.2 Fly ash:

.1 Type F - with CaO content less than 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 C 260/C 260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C 309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C 494/C 494M-10a, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C 1017/C 1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.5 ASTM D 412-06ae2, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.

.6 ASTM D 624-00(2007), Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.

1.1 REFERENCES (Suite)

.2 (Suite)

.1 (Suite)

.7 ASTM D 1751-04(2008), Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.8 ASTM D 1752-04a(2008), Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral Colloid-Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.

.2 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.3 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, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation Meetings: Convene pre-installation meeting one week prior to beginning concrete works.

.1 Ensure key personnel attend.

.1 Verify project requirements.

.2 For this meeting, Contractor shall, among other things (but not limited to) indicate to all if changes to elevations have been required and approved by the Consultant on the project drawings and specifications. Contractor shall confirm that elevations on shop drawings are used and shall also indicate the position of the equipments and the sequence for the concrete pour.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Provide testing inspection results and reports for review by NCC 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 NCC Representative deviations exceeding maximum allowable time of 120 minutes for concrete to be delivered to site of Work and discharged after batching.

1.4 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 - Quality Control.

.2 Provide NCC Representative, minimum 4 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 4 weeks prior to starting concrete work, provide proposed quality control procedures for review by NCC Representative on following items:
.1 Falsework erection.
.2 Hot weather concrete / cold weather concrete.
.3 Curing.
.4 Finishes.
.5 Formwork removal.
.6 Joints.

1.5 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 NCC Representative and concrete producer as described in CSA A23.1/A23.2.
.2 Deviations to be submitted for review by NCC Representative.
.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

PART 2 - PRODUCTS

2.1 DESIGN CRITERIA

.1 Alternative 2 - Prescription : to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

2.2 MATERIALS

.1 Portland Cement: to CSA A3001, Type GUb-SF, general use.

.2 Supplementary cementing materials: with minimum 8% fly ash, by mass of total cementitious materials.

.3 Water: to CSA A23.1.

.4 Aggregates: to CSA A23.1/A23.2.

.5 Admixtures:
.1 Air entraining admixture: to ASTM C 260.

.6 Curing compound: to CSA A23.1/A23.2 white and ASTM C 309, Type 1-chlorinated rubber Type1-D with fugitive dye.

2.3 MIXES

.1 Performance Method for specifying concrete: owner's concrete mix to CSA A23.1.

2.3 MIXES (Suite)

.1 (Suite)

.1 Ensure materials used in concrete mix have been submitted for testing and meet requirements of CSA A23.1.

.2 Contractor to proportion concrete mix for normal including:

.1 Intended application: pile caps, approach slabs, concrete sonotubes for guardrails and slabs for lookout furniture.

.2 Concrete compressive strength at 28 days: 35 MPa or more. For concrete of the guardrail sonotubes and concrete of the slabs for lookout furniture, concrete of 25 MPa or more is accepted, unless notes otherwise on architectural landscaping drawings.

.3 Aggregates: normal-density, minimum 5 mm and maximum 20 mm.

.4 Supplementary cementing materials: with minimum 8 % fly ash replacement , by kg/m^3 of total cementitious material.

.5 Water: Water/cement ratio of 0,45.

.6 Air content : 5 % to 8 %.

.7 Slump: at time and point of discharge 130 to 180 mm.

.8 Proportion concrete mix shall be approved by NCC Representative.

2.4 SELF-ADHESIVE MEMBRANE FOR JOINTS

.1 The self-adhesive membrane for joints shall have a nominal thickness of 3 mm. The following
self-adhesive membranes are the only one accepted for this use:

.1 Sopralene Flam Stick available at Soprema Inc.

.2 Armourbond 180 available at IKO Ltd.

.3 Bakor Modified Plus NP 180 Tack Sheet available at Henry Company Canada Inc.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Obtain NCC Representative's written approval before placing concrete.

3.1 PREPARATION (Suite)

.1 (Suite)
.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.

.3 During concreting operations:
.1 Development of cold joints not allowed.
.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain NCC Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.10 Do not place load upon new concrete until authorized by NCC Representative.

3.2 INSTALLATION/ APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Cold weather conditions are considered required from November 15 at Contractor expenses.

.3 Concrete color of the benches shall be the same as the Redi-Rock blocks specified in the specifications.

3.2 INSTALLATION/ APPLICATION (Suite)

.4 Anchor bolts:
.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.5 Finishing and curing:
.1 Finish concrete to CSA A23.1/A23.2.
.2 Use procedures as reviewed by NCC Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
.3 Use concrete curing compound compatible for concrete surfaces.

3.3 SURVEY OF THE ANCHORS FOR THE BRIDGE

.1 After formworks, reinforcing steel, final set-up of the cast-in-place anchors, cleaning and BEFORE concreting, a surveyor shall valide the location of the anchors for the bearings witht a tolerance of a millimeter.

.2 A written notive shall be produced by the surveyor and forwarded to the NCC Representative indicating that the location of the cast-in-place anchors for the bearings (including elevations) are in accordance with shop drawings and contractual documents.

.3 Associated costs shall be included in the price for the concrete pile caps.

.4 Refer to section 05 12 33 - Construction Steel.

3.4 SETTING-UP SELF-ADHESIVE MEMBRANE FOR JOINTS

.1 When the joint gap exceed allowable width specified by the membrane manufacturer, the Contractor shall first fill in the joint using a
way or a method that is approved by the manufacturer of the membrane. The product use and the steps to fill in the joint shall be supplied to the NCC Representative at least twenty-four (24) hours prior to do the work.

3.4 SETTING-UP SELF-ADHESIVE MEMBRANE FOR JOINTS (Suite)

.2 Installation of the membrane shall be as per manufacturer's instruction and shall be done on clean and dry sufaces after a delay between twelve (12) and twenty-four (24) hours after laying-up tack coat.

.3 After concreting surfaces to be covered with membrane, the self-adhesive membrane for joints shall be installed after a minimum delay of fourteen (14) days, ie seven (7) days of concrete curing followed by six (6) days after complete removal of curing and a period of twenty-four (24) hours starts after the complete removal of any stagnant water. This fourteen (14) day delay could although be reduced if the tack coat is installed after a three (3) day period (consecutive) without precipitations after the complete removal of curing or any stagnant water after a precipitation.

.4 Although the delay shall not be less than ten (10) days following concreting.

.5 Immediately after membrane installation, dust and debris shall be removed using air blast. Material used for air blast shall include a filter collecting oil. Filter efficiency shall be demonstrated before its use to the NCC Representative. If a water cleaing is required to obtain clean surfaces, it should be done before the twenty-four (24) hour period without precipitations.

.6 In all cases, Contactor shall preheat surfaces using a propane torch immediately before installing the membrane.

3.5 SURFACE TOLERANCE

.1 Concrete tolerance to CSA A23.1 Straightedge Method.

3.6 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.

3.6 FIELD QUALITY CONTROL (Suite)

.1 (Suite)
.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 NCC 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 NCC Representative.

.4 Inspection or testing by NCC Representative will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.

3.7 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.
.1 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

FIN DE SECTION

PART 1 - GENERAL

1.1 - RELATED REQUIREMENTS

.1 Section 04 05 00 – Common Work Results for Masonry

.2 Section 04 05 12 – Masonry Mortar and Grout

1.2 - REFERENCES

.1 Definitions:
- .1 Raking: removal of loose/deteriorated mortar to a depth suitable for repointing until sound mortar, and/or 4 times the joint thickness and/or a specified mm depth mm is reached.
- .2 Repointing: filling and finishing of masonry joints from which mortar is missing has been raked out or has been omitted.
- .3 Tooling: finishing of masonry joints using tool to provide final contour.
- .4 Low-pressure water cleaning: water soaking of masonry using less than 350 kPa (50 psi) water pressure, measured at nozzle tip of hose.

.2 Reference Standards:
- .1 ASTM C207-06, Standard Specification for Hydrated Lime for Masonry Purposes.
- .2 ASTM C5-03, Standard Specification for Quicklime for Structural Purposes.
- .3 American Society for Testing and Materials International (ASTM).

.3 CSA International
- .1 CSA A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.
- .2 CSA A179-04(R2009), Mortar and Grout for Unit Masonry.
- .3 CSA A370-04, Connectors for Masonry.
- .4 CSA A371-04, Masonry Construction for Buildings.

1.3 - ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Test and Evaluation Reports:
- .1 Provide certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Provide laboratory test reports certifying compliance of mortar ingredients with specifications requirements.

1.4 - QUALITY ASSURANCE

.1 Masonry Contractor:
- .1 Use single Masonry Contractor for masonry work.
- .2 Masonry Contractor to have 10 years' experience minimum in stone masonry work on projects of similar size and complexity to Work of this Contract.
- .3 Masonry Contractor to have good level of understanding of structural

behaviour of masonry walls when masonry work involves replacing or repairing stones which are part of structural masonry work.

.2 Masons:
- .1 Mason to have certificate of qualification with 10 years minimum experience in historic stone masonry work.
- .2 Masons to have proof of license certification for propriety restoration mortars.

.3 Cement grouting: undertake grouting activities by experienced workers in manipulation and cement grouting methods.

.4 Obtain approval from NCC representative for changes to qualified personnel.

.5 Mock-ups:
- .1 Construct mock-up 0,5 square meter (m2) to demonstrate raking and repointing procedures for the retaining wall masonry material specified in locations designated by Engineer on the existing wall.
- .2 Notify Engineer minimum of 24 hours prior to construction of the mock-up.
- .3 Perform mock-up of masonry cleaning with low pressure 30 psi clean water and soft natural bristle brush.
- .4 Construct mock-up under supervision of Engineer to demonstrate a full understanding of specified procedures, techniques and formulations is achieved before work commences.
- .5 Work not to proceed prior to approval of mock-up. Allow 24 hours for inspection of mock-up by Engineer before proceeding with masonry repointing work.
- .6 Accepted mock-up will demonstrate minimum standard for this work. The accepted mock-ups are to be used as the standard reference for acceptance or rejection of all repointing work on the job.

1.5 - DELIVERY, STORAFE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements:
- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Store cementitious materials and aggregates in accordance with CAN/CSA A23.1.
- .3 Store lime putty in plastic lined sealed drums.
- .4 Keep material dry. Protect from weather, freezing and contamination.
- .5 Ensure that manufacturer's labels and seals are intact upon delivery.
- .6 Remove rejected or contaminated material from site.

1.6 - AMBIENT CONDITIONS

.1 When the air temperature is less than 5^0C, sand and mixing water to be heated to produce mortar at a temperature of not less than 5^0C or more than 27^0C.

.2 Do not place mortar when the temperature is below 0^0C or below 4^0C and falling. Do not repoint at temperatures above 27^0C unless shading and water-misted burlap is provided over new work.

.3 Prior to placing new masonry, heat area for a minimum 24 hours so that the masonry or base materials to which new masonry is to be placed is completely free of frost and above 5^0C. All newly laid masonry/mortar placed during cold weather, shall be protected and heated in a manner that will maintain an air temperature of 5^0C for a minimum of 10 days beyond the required curing period by means acceptable to the Engineer.

PART 2 – PRODUCTS

2.1 - MORTAR

.1 Mortar: in accordance with CSA A179 and Section 04 03 08 - Mortaring.

.2 Proportion Specification:
- .1 In accordance with CSA A179 and Section 04 03 08 - Mortaring.

.3 Property Specification:
- .1 Retaining walls: Phase I (Type I) and Phase II (Type II).
  - .1 Mortar compressive strength at 28 days: minimum 12 MPa, maximum 15 MPa.
  - .2 Air entrainment: ≤10%.
  - .3 Flexural bond strength: minimum 0.2 MPa.
- .2 Pointing mortar: Type S.
  - .1 Mortar compressive strength at 28 days: minimum 12 MPa, maximum 15 MPa.
  - .2 Air entrainment: ≤10%.
  - .3 Flexural bond strength: minimum 0.2 MPa.

PART 3 – EXECUTION

3.1 - SITE VERIFICATION OF CONDITIONS

.1 Report in writing to NCC representative areas of deteriorated masonry not previously identified.

.2 Stop work in that area and report to NCC representative immediately evidence of hazardous materials.

3.2 - PROTECTION OF IN-PLACE CONDITIONS

.1 Protection requirements are specified in Section 04 05 00 - Common Work Results for Masonry.

3.3 - SPECIAL TECHNIQUES

.1 Examine mortar joints.

- .1 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as aspects of workmanship which establish authenticity of original work.
- .2 Replicate the style selected by NCC representative.

.2 Test mortar joints.
  .1 Procedure of testing: examine joints visually for obvious signs of deteriorated masonry.
  .2 Replicate the style selected by NCC representative.
    .1 Test for voids and weakness by using hammers or other approved means.
    .2 Perform testing in co-operation with NCC representative so that unsound joints can be marked and recorded.

3.4 - RAKING JOINTS

.1 Use manual raking tool to obtain clean masonry surfaces. Rake out to the full height of the joint and to minimum depths as follows:
  .1 Joints less than 13 mm: rake out a depth of 10 mm in order to reduce the danger of chipping off stone edges.
  .2 Joints greater than 13 mm and less than 50 mm: rake out to a minimum depth of 2 times the joint width.
  .3 If loose material is encountered during removal for joints fitting any of the above definitions, removal and replacement of up to a 100 mm depth shall be included in the work of chipping and repointing.
  .4 Joints greater than 50 mm in width: rake out to a maximum depth of 2 times the joint width or 150 mm. For joints greater than 50 mm, the NCC representative to provide direction as to whether or not new stone units are to be installed as part of the repointing operation. Where authorized, supply and install new stone units in accordance with specifications. Proceed as directed by the NCC representative.
  .5 Where loose, powdery or sandy joint material is encountered during raking out operation, notify the Engineer who will provide direction on how to proceed.
    .1 Medium to low structural importance: repoint the joint to contain the loose, powdery material and seal against water penetration.
    .2 Joint is voided and/or of primary structural importance: pack the joint to the level of the base of finish pointing or remove and reset the unit in a complete bed of mortar.

.2 Remove mortar without chipping, altering or damaging masonry units.

.3 Clean surfaces of joints by compressed air with non-ferrous brush by moderate water wash without damaging texture of exposed joints or masonry units.

.4 Flush open joints and voids. clean open joints and voids with low pressure water. If not free draining blow clean with compressed air.

.5 Leave no standing water.

3.5 - REPOINTING

.1 Keep masonry damp while pointing is being performed.

.2 Completely fill joint with mortar.
  .1 If surface of masonry units has worn rounded edges keep pointing

back from surface to keep same width of joint.
.2 Avoid feather edges.
.3 Pack mortar solidly into voids and joints.

.3 Build-up pointing in layers not exceeding 12 mm in depth.
.1 Allow each layer to set before applying subsequent layers.
.2 Avoid feather edges.
.3 Pack mortar solidly into voids and joints.

.4 Finish joints to match existing profile as shown on drawings.
.1 Tool, compact and finish using jointing tool to force mortar into joint.

.5 Remove excess mortar from masonry face before it sets.

3.6 - PROTECTION DURING CURING PROCESS

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.
.1 Extend membranes to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.

.2 Cover with waterproof tarps to prevent weather from eroding recently repointed material.
.1 Maintain tarps in place for minimum of 2 weeks after repointing.
.2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.3 Anchor coverings securely in position.

.4 Damp cure:
.1 Provide damp cure for pointing mortars.
.2 Install and maintain wetted burlap protection during the curing process for a minimum of 3 days.
.3 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.
.4 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.5 Protect from drying winds. Pay particular attention at corners of structure.

.6 Maintain minimum ambient temperature of 10^0C after repointing masonry for a minimum of 7 days.

3.7 - CLEANING

.1 Clean surfaces of mortar droppings, stains and other blemishes resulting from work of this contract as work progresses.

.2 Remove droppings and splashings using clean sponge and water.

.3 Do further cleaning using stiff natural bristle brushes after mortar has attained its initial set and has not fully cured.

.4 Clean masonry with stiff natural bristle brushes and plain water only

if mortar has fully cured.

.5 Clean masonry with low pressure 30 psi clean water and soft natural bristle brush.

.6 Obtain approval of Engineer prior to using other cleaning methods for persistent stains.

3.8 - PROTECTION OF COMPLETED WORK

.1 Protect adjacent finished work against damage which may be caused by on-going work.

END OF SECTION

PART 1 – GENERAL

1.1 - RELATED REQUIREMENTS

.1 Section 04 03 07 – Masonry Repointing and Repair

.2 Section 04 05 12 – Masonry Mortar and Grout

1.2 - REFERENCES

.1 Canadian Standards Association (CSA International)
- .1 CSA-A165 Series- 04, Standards on Concrete Masonry Units.
- .2 CSA A179-04, Mortar and Grout for Unit Masonry.
- .3 CSA-A371-04, Masonry Construction for Buildings.

.2 International Masonry Industry All-Weather Council (IMIAC)
- .1 Recommended Practices and Guide Specification for Hot and Cold Weather Masonry Construction.

1.3 - ADMINSTRATIVE REQUIREMENTS

.1 Conduct pre-installation meeting one week prior to commencing work of this Section and on-site installations to:
- .1 Verify project requirements, including mock-up requirements.
- .2 Verify substrate conditions.
- .3 Co-ordinate products, installation methods and techniques.
- .4 Sequence work of related sections.
- .5 Co-ordinate with other building subtrades.
- .6 Review manufacturer's installation instructions.
- .7 Review masonry cutting operations, methods and tools and determine worker safety and protection from dust during cutting operations.
- .8 Review warranty requirements.

1.4 - ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Certificates: provide manufacturer's product certificates certifying materials comply with specified requirements.

.3 Test and Evaluation Reports:
- .1 Test reports to certify compliance of masonry units and mortar ingredients with specified performance characteristics and physical properties.
- .2 Provide data for masonry units, in addition to requirements set out in referenced CSA and ASTM Standards, indicating initial rates of absorption.

1.5 - QUALITY ASSURANCE

.1 Qualifications:
- .1 Manufacturer: capable of providing field service representation during construction and approving application method.

.2 Installer: experienced in performing work of this section who has specialized in installation of work similar to that required for this project.

.3 Masons: company or person specializing in masonry installations with 5 years documented experience with masonry work similar to this project.

.2 Mock-ups:

.1 Construct mock-up where directed by NCC representative.

.2 Allow 24 hours for inspection of mock-up by Engineer before proceeding with work.

.3 When accepted by NCC representative, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.4 Start work only upon receipt of written approval of mock-up by NCC representative.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver materials in accordance with Section 01 61 00 - Common Product Requirements.

1.7 - SITE CONDITIONS

.1 Assemble and erect components when temperatures are above 4^0C.

.2 Weather Requirements: to CSA-A371 - Recommended Practices and Guide Specifications for Hot and Cold Weather Masonry Construction.

.3 Cold weather requirements:

.1 To CSA-A371 with following requirements.

.1 Maintain temperature of mortar between 5^0C and 50^0C until batch is used or becomes stable.

.2 Maintain ambient temperature of masonry work and its constituent materials between 5^0C and 50^0C and protect site from windchill.

.3 Maintain temperature of masonry above 0^0C for minimum of 7 days, after mortar is installed.

.4 Preheat unheated wall sections in enclosure for minimum 72 hours above 10^0C, before applying mortar.

.2 Hot weather requirements:

.1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

.2 Keep masonry dry using waterproof, non-staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

.3 Spray mortar surface at intervals and keep moist for maximum of three days after installation.

PART 2 – PRODUCTS

2.1 - MANUFACTURERS

.1 Ensure manufacturer has minimum 5 years' experience in manufacturing components similar to or exceeding requirements of project.

PART 3 – EXECUTION

3.1 - INSTALLER

.1 Experienced and qualified masons to carry out erection, assembly and installation of masonry work.

3.2 - MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.3 - EXAMINATION

.1 Examine conditions, substrates and work to receive work of this Section.
- .1 Co-ordinate with Section 01 71 00 - Examination and Preparation.

.2 Examine openings to receive masonry units. Verify opening size, location, and that opening is square and plumb, and ready to receive work of this Section.
- .1 Inform NCC representative of unacceptable conditions immediately upon discovery.
- .2 Proceed with installation after receipt of written approval from NCC representative.

.3 Verification of Conditions:
- .1 Verify that:
  - .1 Substrate conditions which have been previously installed under other sections or contracts, are acceptable for product installation in accordance with manufacturer's instructions prior to installation of concrete block.
  - .2 Field conditions are acceptable and are ready to receive work.
  - .3 Built-in items are in proper location, and ready for roughing into masonry work.
- .2 Commencing installation means acceptance of existing substrates.

3.4 - PREPARATION

.1 Prepare surface in accordance with manufacturer's written recommendations and co-ordinate with Section 01 71 00 - Examination and Preparation.

.2 Establish and protect lines, levels, and coursing.

.3 Protect adjacent materials from damage and disfiguration.

3.5 - INSTALLATION

.1 Do masonry work in accordance with CSA-A371 except where specified otherwise.

.2 Build masonry plumb, level, and true to line, with vertical joints in alignment, respecting construction tolerances permitted by CSA-A371.

.3 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.6 - CONSTRUCTION

.1 Exposed masonry:
- .1 Remove chipped, cracked, and otherwise damaged units, in accordance with CSA A-165, in exposed masonry and replace with undamaged units.

.2 Jointing:
- .1 Allow joints to set just enough to remove excess water, then rake joints uniformly to 6 mm depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.

.3 Cutting:
- .1 Cut out for electrical switches, outlet boxes, and other recessed or built-in objects.
- .2 Make cuts straight, clean, and free from uneven edges.

.4 Support of loads:
- .1 Use 30 MPa concrete to Section 03 30 00 - Cast-in-Place Concrete, where concrete fill is used in lieu of solid units.

3.7 - SITE TOLERANCES

.1 Tolerances in notes to CSA-A371 apply.

3.8 - FIELD QUALITY CONTROL

.1 Site Tests, Inspection:
- .1 Perform field inspection and testing in accordance with Section 01 45 00 - Quality Control.
- .2 Notify inspection agency minimum of 24 hours in advance of requirement for tests.

3.9 - CLEANING

.1 Progress Cleaning: in accordance with related masonry sections.

.2 Final Cleaning:
- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Upon completion of installation and verification of performance of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.10 - PROTECTION

.1 Temporary Bracing:
- .1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.
- .2 Bracing approved by NCC representative.
- .3 Brace masonry walls as necessary to resist wind pressure and lateral forces during construction.

.2 Moisture Protection:
- .1 Keep masonry dry using waterproof, nonstaining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until completed and protected by flashing or other permanent construction.
- .2 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day. Anchor securely in position.
- .3 Air Temperature Protection: protect completed masonry as recommended in 1.8 SITE CONDITIONS.

END OF SECTION

PART 1 – GENERAL

1.1 - RELATED REQUIREMENTS

.1 Section 04 03 07 – Masonry Repointing and Repair

.2 Section 04 05 00 – Common Work Results for Masonry

1.2 - REFERENCES

.1 Canadian Standards Association (CSA International)
- .1 CSA-A23.1/A23.2-04, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA A179-04, Mortar and Grout for Unit Masonry.
- .3 CSA A371-04, Masonry Construction for Buildings.
- .4 CSA-A3000-03, Cementitious Materials Compendium; CSA-A3002-03, Masonry and Mortar Cement.

1.3 - ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:
- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide two copies of Workplace Hazardous Materials Information System (WHMIS) - Material Safety Data Sheets (MSDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements. Indicate VOC's mortar, grout, colour additives and admixtures expressed as grams per litre (g/L).

.2 Samples:
- .1 Provide unit samples in accordance with Section 04 05 00 - Common Work Results for Masonry, supplemented as follows:
  - .1 Provide confirmation of source or product data sheet, prior to mixing or preparation of mortars, to Engineer of:
    - .1 Aggregate: course aggregate and sand.
    - .2 Cement.
    - .3 Lime.
    - .4 Colour pigment samples.

1.4 - QUALITY ASSURANCE

.1 Test Reports: certified test reports including sand gradation tests in accordance with CSA A179 showing compliance with specified performance characteristics and physical properties, and in accordance with Section 04 05 00 - Common Work Results for Masonry.

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

.3 Mock-ups:
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control and requirements of Section 04 05 00 - Common Work Results

for Masonry.

1.5 - DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handles masonry mortar and grout materials in accordance with Section 01 61 00 - Common Product Requirements, supplemented as follows:
  .1 Deliver prepackaged, dry-blended mortar mix to project site in labelled plastic-lined bags each bearing name and address of manufacturer, production codes or batch numbers, and colour or formula numbers.
  .2 Maintain mortar, grout and packaged materials clean, dry, and protected against dampness, freezing, traffic and contamination by foreign materials.

1.6 - SITE CONDITIONS

.1 Maintain materials and surrounding air temperature to:
  .1 Minimum 10^0C prior to, during, and 48 hours after completion of masonry work.
  .2 Maximum 32^0C prior to, during, and 48 hours after completion of masonry work.

PART 2 - PRODUCTS

2.1 - MATERIALS

.1 Mortar and Grout for Unit Masonry to be in accordance with CSA A179-04 and as augmented by these specifications.

.2 Cement:
  .1 Portland Cement: to CSA-A3000, Type GU - General use hydraulic cement (Type 10) gray colour.
    .1 Acceptable Material: Portland Cement manufactured by Federal Cement Ltd., Ingersoll, Ontario.

.3 Aggregate: supplied by one supplier.
  .1 Aggregate to be well-graded sand (concrete sand conforming to CSA A179) matching texture and range of sizes found in existing joints. Colour of sand to match that of the surrounding mortar; a blending of sands may be required to achieve a satisfactory colour match. Mortar colour should ideally be achieved through mixing of colours of sand. Colour match using pigments must only be done after approval is given by NCC representative.
  .2 Course Aggregate for wide joints and mortar: 6 mm (maximum) washed crushed limestone with no fines passing a 1.18 mm sieve. Source coarse aggregate from quarries approved by the Ministry of Transportation of Ontario with respect to alkali aggregate reactivity (AAR) or that can provide documentation showing that the aggregate has been tested within the last three years and meets the requirements of CSA A23.1/A23.2 with respect to AAR.

.4 Water: clean and potable.

.5 Lime:

.1 Lime to be preferably slaked quicklime putty made from finely ground crushed quicklime.
.2 Acceptable Material:
.1 Quicklime for structural purposes: 5 mm – fines, dry-bagged quicklime manufactured by Domtar Chemicals and distributed by Sylvite Agri-Services Ltd.
.2 Dolomitic finishing hydrated lime (Type S).

.6 Pigments:
.1 Dry, powdered, inorganic pigments, manufactured by Northern Pigment Ltd., Toronto, Ontario.

2.2 - MIX FORMULA

.1 Finish Pointing Mortar and Interior Mortar for Stonework:
.1 Cement: Lime: Aggregate (1:2.5:6) Air Entrainment: ≤10%. Add air entraining agent as required to achieve this level of air entrainment.
.2 Mixing: Mix mortar as dry as possible to minimize shrinkage and cracking.

PART 3 – EXECUTION

3.1 - EXAMINATION

.1 Request inspection of spaces to be grouted.

3.2 - PREPARATION

.1 Apply bonding agent to existing concrete surfaces.

.2 Plug clean-out holes with block masonry units. Brace masonry for wet grout pressure.

3.3 - MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.4 - CONSTRUCTION

.1 Do masonry mortar and grout work in accordance with CSA A179 except where specified otherwise.

3.5 - MIXING

.1 Mix all pointing mortar using a regular paddle mixer. Only electric motor mixers are permissible. Mixing by hand must be pre-approved by the Engineer.

.2 Clean all mixing boards and mechanical mixing machine between batches.

.3 Mortar must be weaker than the units it is binding.

.4 Appoint one individual to mix mortar, for duration of project. In the event that this individual must be changed, mortar mixing must cease until the new individual is trained, and mortar mix is tested.

3.6 - MORTAR PLACEMENT

.1 Install mortar to requirements of CAN/CSA A179.

.2 Remove excess mortar from grout spaces.

3.7 - GROUT PLACEMENT

.1 Install grout in accordance with manufacturer's instructions.

.2 Install grout in accordance with CSA A179.

.3 Work grout into masonry cores and cavities to eliminate voids.

.4 Do not install grout in lifts greater than 400 mm, without consolidating grout by rodding.

.5 Do not displace reinforcement while placing grout.

3.8 - FIELD QUALITY CONTROL

.1 Site Tests, Inspection: in accordance with Section 04 05 00 - Common Work Results for Masonry supplemented as follows:
   .1 Test and evaluate mortar during construction in accordance with CSA A179.
   .2 Test and evaluate grout during construction to CSA A179; test in conjunction with masonry unit sections specified.

.2 Manufacturer's Field Services: in accordance with Section 04 05 00 - Common Work Results for Masonry.

3.9 - CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

.2 Remove droppings and splashings using clean sponge and water.

.3 Clean masonry with low pressure clean water and soft natural bristle brush.

3.10 - PROTECTION OF COMPLETED WORK

.1 Cover completed and partially completed work not enclosed or sheltered with waterproof covering at end of each work day

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 13 34 30 - Prefabricated Steel Bridge.

.2 03 30 00 - Cast-in-Place Concrete.

.3 31 62 16.16 - Steel H Piles.

.4 Current section is applicable to any steel element. Refer to drawings for more information.

1.2 PRICE AND PAYMENT PROCEDURES

.1 There is no specific cost of specific item for steel. Cost shall rather be included in element to which it relates.

1.3 REFERENCES

.1 13 34 30 - Prefabricated Steel Bridge.

.2 03 30 00 - Cast-in-Place Concrete.

.3 13 34 30 - Steel H Piles.

.4 ASTM International
.1 ASTM A 325M-14, Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength Metric.
.2 ASTM A 490M-15, Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.

.5 CSA International
.1 CSA A23.1/A23.2-14, Concrete materials and methods of concrete construction / Test methods and standard practices for concrete.
.2 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.3 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
.4 CAN/CSA S6-14, Canadian Highway Bridge Design Code.
.5 CSA S16-14, Design of Steel Structures.
.6 CSA S269.1-1975(R2003), Falsework for Construction Purposes.

1.3 REFERENCES (Suite)

.5 (Suite)

.7 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.

.8 CSA W59-13, Welded Steel Construction, (Metal Arc Welding).

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation meeting for prefabricated steel bridge:

.1 Convene pre-installation meeting 3 week prior to beginning work for installation of prefabricated with Contractor's Representative, NCC Representative, Representant of the prefabricated bridge manufacturer, Crane operator Supervisor, Crane operators working on the project, and Consultant to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other subtrades.

.4 Installation method of the Contractor.

.5 Review manufacturer's written installation instructions and warranty requirements.

.2 Prior to start of Work arrange for site visit with NCC Representative to examine existing site conditions adjacent to demolition work.

.3 Hold project meetings biweekly.

.4 Ensure key personnel and project manager attend.

.5 NCC Representative will provide written notification of change to meeting schedule established upon contract award 24 hours prior to scheduled meeting.

.6 Site Meetings: as part of Manufacturer's Services described in PART 3 - FIELD QUALITY CONTROL, schedule site visits, to review Work.

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 structural steel and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 30 - Health and Safety Requirements 01 35 43 - Environmental Procedures.

.3 Shop Drawings:
.1 Submit drawings stamped and signed by an engineer licensed by the Ordre des ingénieurs du Québec.
.2 Shop drawings shall be transmitted at least three (3) weeks prior to start fabrication at the manufacturer plant.
.3 Shop drawings shall be approved by the NCC Representative and the Consultant prior to proceed with the fabrication at the manufacturing plant.
.4 Indicate shop and erection details including shop splices, cuts, copes, connections, holes, bearing plates, threaded fasteners, rivets, welds, and elevations. Indicate welds by CSA W59, welding symbols.
.5 Proposed welding procedures to be stamped and approved by Canadian Welding Bureau.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Provide protective blocking for lifting, transportation and storing.
.1 Exercise care during fabrication, transportation and erection so as not to damage girders and beams and other pieces.
.2 Do not notch edges of members.
.3 Do not cause excessive stresses.

.3 Ensure that no portion of steel comes into contact with ground.

1.6 DELIVERY, STORAGE, AND HANDLING (Suite)

.4 Provide NCC Representative with delivery schedules minimum 7 days prior to shipping.

.5 Delivery and Acceptance Requirements: deliver materials on site in original factory packaging, labelled with manufacturer's name and address.

1.7 QUALITY ASSURANCE

.1 Preconstruction Testing:
.1 Provide suitable facilities and cooperate with NCC Representative in carrying out inspection and tests required.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Structural steel: to CSA G40.20/G40.21, grade and types as indicated. For items not listed, use 350A.
.1 Leave atmospheric corrosive resistant steel and connections material in unpainted, include bolts, nuts, washers and weld deposits of compatible weathering characteristics.

.2 High strength bolts, nuts and washers for atmospheric corrosion resistant steels: to ASTM A 325M. Bolts to ASTM A490M approved by NCC Representative.

.3 Anchor bolts, washers and nuts: as noted in contractual documents. For items not listed, used 350A, they shall be in compliance with CSA G40.20/G40.21, 300A steel.

.4 Bearings: to CSA G40.20/G40.21, Grade 350A and to CAN/CSA S6.

.5 Welding electrodes: to CSA W48 series.

.6 Stud shear connectors: to CSA W59, Clause 5.5.6 and Appendix H.

.7 Hot dip galvanizing when applicable : to CAN/CSA G164, minimum zinc coating of 600 g/m^2.

2.1 MATERIALS (Suite)

.8 Shrinkage compensating grout: premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents.

2.2 SOURCE QUALITY CONTROL

.1 Steel producer qualifications: certified in accordance with CSA G40.20/G40.21.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of Substrates previously installed under other Sections or Contracts are acceptable for structural steel installation in accordance with manufacturer's written instructions.
.1 Inform NCC Representative of unacceptable conditions immediately upon discovery.
.2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from NCC Representative.

3.2 PREPARATION

.1 Clean steel surfaces as directed by NCC Representative when staining or defacing occurs.

.2 Verify location of substructure units, elevations of bearing seats and location of anchor bolts before erection of structural steel; report discrepancies to NCC Representative.

3.2 PREPARATION (Suite)

.3 Works near river banks or embankments shall be executed in compliance with the environmental certificate of authorization and with written instructions of the NCC Representant. Contractor commit itself to have the environmental certificate of authorization in the constuction site trailor at any time for the entire duration of the job on site, as well as associated requirements. Contractor is responsible of any inquiries to concerned ministries, when its method or part of its method is not covered by the certificate of authorization. Contactor shall also foresee required delays to works and Contractor is not authorize to modify contractual delays.

.4 Restrict drifting during assembly to minimum required to bring parts into position without enlarging or distorting holes, and without distorting, kinking or sharply bending metal of any unit.
.1 Enlarge holes if necessary by reaming only after receipt of written approval from NCC Representative after obtaining the authorization of the Consultant and written authorization of the Manufacturer engineer.
.2 Ensure reamed holes are 2 mm maximum larger than bolt size used.

.5 Fabricate and install bearings as indicated.

.6 BEFORE concreting, place anchor bolts at elevations and locations indicated in accordance with section 03 30 00 - Cast-in-Place Concrete.
.1 Elevation of bearing seats and anchor bolts shall be transmitted to NCC Representant at least ten (10) working days before positioning them on site and before concreting.
.2 Protect holes against entry of water and foreign material.
.3 Provide heating and protection to CSA A23.3 and CSA S6 and as directed by NCC Representative and completely fill space around anchor bolts with grout.

3.3 INSTALLATION

.1 Do falsework in accordance to CSA S269.1.

3.3 INSTALLATION
(Suite)

.2 Do fabrication and erection of structural steel in accordance with CAN/CSA S6.

.3 Do welding in accordance with CSA W59, except where specified otherwise.

.4 High strength bolting: in accordance with CAN/CSA S6 CSA S16. Use 'turn-of-nut' tightening method.

.5 Finish: members true to line, free from twists, bends, open joints, sharp corners and sharp edges.

.6 Allowable tolerance for bolt holes:
.1 Matching holes for bolts to line up so that dowel 2 mm less in diameter than hole passes freely through assembled members at right angles to such members.
.2 Finish holes not more than 2 mm in diameter larger than diameter of rivet or bolt unless otherwise specified by NCC Representative.
.3 Centre-to-centre distance between any two holes of group to vary by not more than 1 mm from dimensioned distance between such holes.
.4 Centre-to-centre distance between any two groups of holes to vary not more than maximum of the following:

Centre-to-Centre distance in metres	Tolerance in plus or minus mm
less than 10	1
10 to 20	2
20 to 30	3

.5 Correct mispunched or misdrilled members only as directed by CC Representative.

.7 Span length tolerances:
.1 Girders and beams: plus or minus 6 mm
.2 Centre-to-centre of bearing stiffeners and bearing plates: plus or minus 3 mm.
.3 No additional adjustment is allowed depending on the installation temperature on site.

.8 Girder support requirements:

3.3 INSTALLATION (Suite)

.8 (Suite)
.1 Support top and bottom flanges of ends of girders and intermediate bearing locations of continuous girders parallel to each other at 90 degrees to girder web (including HSS members).
.2 Install flat and smooth except as otherwise indicated.
.3 Install bearing stiffeners after girder support requirements have been met.
.4 Correct irregularities of flanges of girders as permitted by NCC Representative.

.9 Shop splices, bolted type. To authorize a welded joint, conditions and following approval must be met.
.1 Joint detailed issued on the first shop drawings transmission for approval.
.2 Use complete joint penetration groove welds finished flush.
.3 Details of butt joints to CSA W59.
.4 Use only as approved by NCC Representative and Consultant.

.10 Camber:
.1 Camber tolerances for plate girders to be to CSA W59.
.2 Record measurements of camber of each girder, at points indicated.
.3 Fabricate field splices to conform to required camber.
.4 Camber indicated on drawings is a final camber at the end of works. Contractor is responsible to determine the construction camber required to obtain camber indicated on drawings at the end of works. In default, a holdback will be applied if camber does not meet requirements.
.5 Submit diagram to NCC Representative showing camber for each girder fabricated.
.6 Advise NCC Representative immediately when camber of fabricated girder is greater than specified tolerances and propose a correction method to Contractor costs.
.7 Submit proposal for corrective measures.
.8 Undertake remedial measures as approved by NCC Representative.

.11 Shop erection:

3.3 INSTALLATION (Suite)

.11 (Suite)
.1 Support each girder on its bearing points and measure and record deflection at same points indicated for measurement of camber.
.2 Measure deflections in plane of girder web.
.3 Submit diagram to NCC Representative showing deflection measurements for each girder before delivery.
.4 Shop erection is not required for single span girders with no field splices.

.12 Field splices: to approval of NCC Representative.

.13 Mark members in accordance with CSA G40.20/G40.21.
.1 Do not use die stamping.
.2 Place marking at locations hidden when viewed from exterior after erection when steel is to be left in unpainted condition.

.14 Match marking: shop mark bearing assemblies and splices.

.15 Protect exposed concrete surfaces of substructures from staining due to weathering of unpainted steel as follows:
.1 Apply two coats of resin to concrete surfaces prior to erection of steel.
.1 Resin: quick drying clear co-polymer resin, based on methyl methacrylate formulation.
.2 Apply resin in accordance with manufacturer's instructions.
.2 Protect top surfaces of concrete with waterproof cover and drain away from vertical faces.
.1 Install drain pipe to ground surface to discharge water.
.3 Use galvanized anchors for anchorage to concrete.
.4 Submit details of installation and methods of support to NCC Representative for review prior to commencing protection work.
.5 Repair tears or holes in protective cover immediately.

.16 Maintain protection of concrete for 7 days after completion of steel erection.

3.3 INSTALLATION (Suite)

.16 (Suite)

.1 Remove waterproof covers and drains and holding structures when steel erection complete.

3.4 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 A manufacturor technical advisor shall be on site at least for the following steps: during the first three (3) days of assembly near final site location and during the entire duration of the installation above water course. The technical advisor shall be on site until cranes completed the installation.

.2 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, protecting and cleaning of steel.

.3 Maximum two (2) working days after bridge installation, Contractor shall submit to NCC Representative a written advice of acceptance indicating that the installed structure is in compliance with the approved shop drawings as well as manufacturer recommendations. The written advice shall be signed and sealed by an engineer licensed by the Ordre des ingénieurs du Québec and shall indicate time and date of the engineer inspection. If this written advice is submitted after more than two (2) days, a permanent holdback will be applied to payment.

.4 Submit manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.5 Ensure manufacturer's representative is present before installation, during critical periods of installation and during construction of field joints.

.6 Schedule site visits:

.1 After delivery and storage of products, and when preparatory Work, or other Work, on which the Work of this Section depends, is complete but before installation begins.

.2 Upon completion of the Work, after cleaning is carried out.

3.5 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials for 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.

FIN DE SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Contractor to design, fabricate, supply, transport, assemble and install a prefabricated steel bridge and bearings that take place on abutments, as identify on drawings.

.2 Prefabricated bridge to be in accordance with criteria specified on drawings as well as CAN/CSA S6 and all other pertinent standards.

.3 Provide sealed and signed design drawings stamped by two (2) Professionnal Engineer licensed to practice in the Province of Quebec (OIQ) or the Province of Ontario (PEO). At least one Engineer shall be member of OIQ.

1.2 RELATED REQUIREMENTS

.1 Specification Section 05 12 33 - Construction Steel (Acier de construction) is an integrated part of prefabricated steel bridge requirements.

1.3 PRICE AND PAYMENT PROCEDURES

.1 Prefabricated steel bridge will be paid based on a lump sum as detailed in 01 11 00 - Works summary.

.2 Bearings will be paid based on a lump sum.

1.4 REFERENCES

.1 05 12 33 - Construction Steel (Acier de construction)

.2 American Society for Testing and Materials International, (ASTM)
.1 ASTM A123M-13, Standard Specification for Zinc (Hot-Dip Galvanised) Coatings on Iron andSteel Products.
.2 ASTM A153/A153M-09, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

1.4 REFERENCES (Cont'd)

.2 (Cont'd)

.3 ASTM A193M-14, Standard Specification for Alloy-Steel and Stainless Stell Bolting for High Temperature or High Pressure Service and Other Special Purpose Applications.

.4 ASTM A307-10 - Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strenght.

.5 ASTM A325M-13, Specification for High-Strengh Bolts for Structural Steel Joints Metric.

.6 ASTM A490M-15, Standard Specification High-Strengh Steel Bolts.

.3 Canadian Standards Association (CSA International)

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

.2 CAN/CSA G164-M92 (R2003), Hot Dip Galvanizing or Irregularly Shaped Articles.

.3 CAN/CSA S6-14, Canadian Highway Bridge Design Code.

.4 CAN/CSA W47.1-09 (R2014), Certification of Companies for Fusion Welding of Steel.

.5 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.

.6 CSA W59-13, Welded Steel Construction, (Metal Arc Welding) (Metric Version).

.7 CAN/CSA G164 Hot Dip Galvanizing of Irregularly Shaped Articles.

.8 CAN/CSA O80 Series-15, Wood Preservation.

.4 National Lumber Grades Authority (NLGA)

.1 NLGA Standard Grading Rules for Canadian Lumber, 2014 Edition.

1.5 SYSTEM DESCRIPTION

.1 Bridge shall comprise longitudinal steel trusses, floor beams, stringers and diagonals, as illustrated on drawings. Refer to drawings for required dimensions.

1.5 SYSTEM DESCRIPTION (Cont'd)

.2 The entire walkway surface shall be composed of a non-slip surface specially designed aggregate/epoxy system, as provided by Algonquin (or equivalent approved by NCC Representative), over a properly prepared steel surface. Please contact Joel Vallée (506-871-9745 or jvallee@algonquinbridge.com), for further details on approved coating. The non-slip surface must be applied by an approved applicator with a minimum of 10 years experience in performing this system and must also be applied by manufacturer at factory on steel sheets. Steel sheets to sit and to be welded on stringers and floor beams prior to application of non-slip surface coating.

.3 The internal clearance between the bridge trusses shall be 3500 mm as shown on drawings.

.4 Handrails shall be at 1400 mm high and shall be provided on each side of the walkway, as shown on drawings. Refer to required dimensions.

.5 Anchors for bearings to be precast in concrete.

.6 Camber: Provide bridge with a construction camber that counter the effects of full dead load deflection in order to obtain final camber shown on drawings. Refer to Section 05 12 33 - Construction Steel (acier de construction) for more details.

1.6 DESIGN REQUIREMENTS

.1 Design Loadings and Environmental Conditions

.1 Bridge shall be able to sustain the most stringent requirements from the following:

.1 Minimum theoretical design live loads shown on drawings

.2 CAN/CSA S6 requirements

.2 The bridge shall be designed so as be suitable for use in areas subject to the following environmental conditions:

.1 Temperatures: -30°C to +50°C.

.2 Wind Speeds: as per CSA S6 for the city of Gatineau.

.3 Seismic loads: as per CSA S6 for the city of Gatineau.

1.6 DESIGN REQUIREMENTS (Cont'd)

.1 (Cont'd)
.2 (Cont'd)
.4 Other requirements: as per CSA S6 for the city of Gatineau.

.2 Live Load Deflection:
.1 Design bridge in order to meet the most stringent requirements from the following:
.1 Maximum Live Load Deflection of L/1000 under artificial loading of CL-625 Truck from the CSA S6 (even if CL-625 truck is not part of loading conditions ultime limit stress).
.2 Section 3.4.4 of the CSA S6 uner CL-625 Loading for a The case of sidewalks with frequent pedestrian circulation (Avec trottoirs - circulation piétonnière fréquente) (even if CL-625 truck is not part of loading conditions at ultimate limit stress).
.3 Other applicable requirements of CAN/CSA S6.

.3 Bridge Bearings:
.1 Contractor to Design bridge bearings in accordance with the Canadian Highway Bridge Design Code CSA S6-14. Refer to Section 05 12 33 - Construction Steel (Acier de construction) for bearings (Éléments d'appui). Galvanize components for bearing system in accordance with ASTM A153/A153M and CAN/CSA G164.
.2 Elevations: refer to subsection Submittal if underside of bridge bearing elevation would need to be adjusted.

1.7 SUBMITTALS

.1 Six (6) weeks after the tender award (octroi du contrat), submit the following information to NCC (National Capital Commission) in accordance with 01 33 00 - Submittals Review and Acceptance.

.2 Three (3) bound copies and one (1) electronic copy in PDF format of the design and assembly drawings and instructions including bearings at each end of bridge as well as all other required documents covered be the current contact.

1.7 SUBMITTALS
(Cont'd)

.3 A schematic for each part - three (3) paper copies and one (1) electronic copy in PDF format.

.4 Design drawings indicating information including but not limited to plans and grid lines, structural members and connection details, bearing and anchorage details, accessories, schedule of materials and finishes, construction camber, calculated final camber at the end of works, loads and reaction forces, fasteners and welds. Indicated welds by CSA W59, welding symbols.

.5 one detailed illustrated method to put in place the prefabricated steel bridge on bearings over water.

.6 Total mass of the bridge parts delivered as well as mass of assembled parts when the bridge will be put in place and total final dead load.

.7 A proof of a valid welding certification in accordance with CSA W47.1.

.8 Proposed welding procedures to be stamped and approved by Canadian Welding Bureau.

.9 Submit description of methods, temporary bracing and strenghtening, sequence of erection and type of equipment proposed for use in erecting bridge on site.

1.7 SUBMITTALS (Cont'd)

.10 Proposed bridge bearings dimensions are identified on drawings. Contractor to design the bearings and adjust bearing dimensions as required. In the case of designed Contractor bearing dimensions differ from those identified on Tender Drawings, Contractor shall adjust other elevations or dimensions of the abutments. Any adjustment shall appear on initial shop drawings submission and shall be clearly identified with a cloud around each value modified for revision and approbation by the NCC's Representative and Consultant. Contractor is fully responsible for these adjustments. NCC's Representative and Consultant cannot be taken responsible of these changes in any circumstances. Some of these adjustments include, but not limited to:

.1 Bearing thickness
.2 Bearing dimensions
.3 Underside Elevation bearings
.4 Elevation abutment
.5 Height of ballast wall (garde-grève)
.6 Reinforing steel into ballast wall
.7 All other required adjustments

1.8 DELIVERY, STORAGE AND HANDLING

.1 Ensure no portion of steel comes in contact with ground.

.2 Store materials on flat, level surface, raised above ground, with adequate support.

.3 Protect materials and finish during delivery, storage, handling, and installation to prevent damage.

PART 2 - PRODUCTS

2.1 MATERIAL THICKNESSES

.1 For bridge components, the minimum thickness of steel to be used for the various elements shall be as follow:

.1 All major structural elements, except for the webs of rolled shapes and the ribs and plates of decks, shall have a minimum thickness of 8 mm.

2.1 MATERIAL THICKNESSES (Cont'd)

.1 (Cont'd)

.2 Webs of rolled shapes shall have a minimum thickness of 6 mm.

.3 Ribs and plates of decks shall have a minimum thickness of 5 mm.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

.1 Refer to 05 12 33 - Construction Steel (Acier de construction).

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

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

.1 ASTM C 127-04, Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate.

.2 ASTM D 1557-02e1, Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m^3)).

.3 ASTM D 4253-00, Standard Test Methods for Maximum Index Density and Unit Weight of Soils Using a Vibratory Table.

1.2 DEFINITIONS

.1 Corrected maximum dry density is defined as:

.1 D = (D1xD2) / ((F1 x D2) + (F2 x D1))

.2 D = (F1 x D1) + (0.9 x D2 x F2)

.3 Where: D = corrected maximum dry density kg/m^3.

.1 F1 = fraction (decimal) of total field sample passing 19 mm sieve

.2 F2 = fraction (decimal) of total field sample retained on 19 mm sieve (equal to 1.00 - F1)

.3 D1 = maximum dry density, kg/m^3 of material passing 19 mm sieve determined in accordance with Method A C of ASTM D 698 ASTM D 1557.

.4 D2 = bulk density, kg/m^3, of material retained on 19 mm sieve, equal to 1000G where G is bulk specific gravity (dry basis) of material when tested to ASTM C 127.

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 BNQ - Bureau de normalisation du Québec
.1 BNQ 2560-114/2014 - Travaux de génie civil - Granulats.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for aggregate materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
.1 Allow continual sampling by NCC Representative during production.
.2 Provide NCC Representative with access to source and processed material for sampling.
.3 Install sampling facilities at discharge end of production conveyor, to allow NCC Representative to obtain representative samples of items being produced. Stop conveyor belt when requested by NCC Representative to permit full cross section sampling.
.4 Pay cost of sampling and testing of aggregates which fail to meet specified requirements.

1.3 DELIVERY, STORAGE AND HANDLING

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

.2 Transportation and Handling: handle and transport aggregates to avoid segregation, contamination and degradation.

.3 Storage: store washed materials or materials excavated from underwater 24 hours minimum to allow free water to drain and for materials to attain uniform water content.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aggregate quality: sound, hard, durable material free from soft, thin, elongated or laminated particles, organic material, clay lumps or minerals, free from adherent coatings and injurious amounts of disintegrated pieces or other deleterious substances.

.2 Flat and elongated particles of coarse aggregate: to BNQ 2560-114.
.1 Greatest dimension to exceed 5 times least dimension.

.3 Fine aggregates satisfying requirements of applicable section to be one, or blend of following:
.1 Screenings produced in crushing of quarried rock, boulders, gravel or slag.
.2 Reclaimed asphalt pavement.
.3 Reclaimed concrete material.

.4 Coarse aggregates satisfying requirements of applicable section to be one of or blend of following:
.1 Crushed rock.
.2 Gravel and crushed gravel composed of naturally formed particles of stone.
.3 Light weight aggregate, including slag and expanded shale.

2.2 SOURCE QUALITY CONTROL

.1 Inform NCC Representative of proposed source of aggregates and provide access for sampling 4 weeks minimum before starting production.

.2 If materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate alternative source.

.3 Advise NCC Representative 4 weeks minimum in advance of proposed change of material source.

2.2 SOURCE QUALITY CONTROL (Cont'd)

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

PART 3 - EXECUTION

3.1 PREPARATION .

.1 Processing:

.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation.

.2 Blend aggregates, as required, including reclaimed materials that meet physical requirements of specification is permitted in order to satisfy gradation requirements for material and, percentage of crushed particles, or particle shapes specified.

.1 Use methods and equipment approved in writing by NCC Representative.

.2 Stockpiling:

.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by NCC Representative. Do not stockpile on completed pavement surfaces.

.2 Stockpile aggregates in sufficient quantities to meet project schedules.

.3 Stockpiling sites to be level, well drained, and of adequate bearing capacity and stability to support stockpiled materials and handling equipment.

.4 Except where stockpiled on acceptably stabilized areas, provide compacted sand base not less than 300 mm in depth to prevent contamination of aggregate. Stockpile aggregates on ground but do not incorporate bottom 300 mm of pile into Work.

.5 Separate different aggregates by strong, full depth bulkheads, or stockpile far enough apart to prevent intermixing.

.6 Do not use intermixed or contaminated materials. Remove and dispose of rejected materials as directed by NCC Representative within 48 hours of rejection.

.7 Stockpile materials in uniform layers of thickness as follows:

3.1 PREPARATION (Cont'd)

.2 (Cont'd)

.7 (Cont'd)

.1 Maximum 1.5 m for coarse aggregate and base course materials.

.2 Maximum 1.5 m for fine aggregate and sub-base materials.

.3 Maximum 1.5 m for other materials.

.8 Uniformly spot-dump aggregates delivered to stockpile in trucks and build up stockpile as specified.

.9 Do not cone piles or spill material over edges of piles.

.10 Do not use conveying stackers.

.11 During winter operations, prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

3.2 CLEANING

.1 Leave aggregate stockpile site in tidy, well drained condition, free of standing surface water.

.2 Leave any unused aggregates in neat compact stockpiles.

END OF SECTION

PART 1 - GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM)
.1 ASTM D 1143-07(2013), Standard Test Method for Piles Under Static Axial Compressive Load.
.2 ASTM D 4945-12, Standard Test Method for High-Strain Dynamic Testing of Piles.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit 2 weeks before testing, outline of test method to be employed as specified and include drawings showing details of test set up.

.3 Quality assurance submittals:
.1 Preliminary results shall be submitted to the NCC Representative within a forty-eight (48) hours delay after the tests.
.2 Contractor shall submit to NCC Representative a final report for the pile driving analysis. This report shall be prepared by a geotechnical company and shall include all analysis results, dynamic testing on piles, results of the CAPWAP analysis as well as relevant commentaries on pile integrity and problems met. The final report shall be signed by an engineer licensed of the Ordre des ingénieurs du Québec and shall be submitted within seven (7) days after test realisation.
.3 Test reports: submit 3 copies of dynamic test reports from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties. The test report includes, but not limited to, the CAPWAP analysis.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Not Used.

PART 3 - EXECUTION

3.1 GENERAL

.1 Allowable design load capacity of pile under factor load is as indicated on drawings.

.2 The Contractor shall confirm the capacity of piles through dynamic test in accordance with ASTM D 4945.
.1 Include drawings showing details of test set up.

.3 Supply and erect equipment and temporary structures necessary for making tests.

.4 NCC Representative to select piles for testing at the end of Work.

.5 Test to be performed in presence of NCC Representative, otherwise the test must be repeated without additional costs to NCC.

.6 Provide shelter, enclosures and lighting for observation, testing and recording of data.

3.2 TESTING

.1 A minimum period between the end of pile driving and dynamic test is required; the delay is indicated on drawings.

.2 Do dynamic tests and prepare reports in accordance with ASTM D 4945.

3.3 TEST EVALUATION

.1 Qualified geotechnical engineer to interpret results for predicting pile performance and capacity.

3.3 TEST EVALUATION (Suite)

.2 Carry out additional load tests, at the Contractor's expense, as directed by NCC Representative if pile fails to sustain test load.

.3 Contractor shall verify geotechnical resistance of three (3) different piles for each abutment (pile cap). Piles chosen by the NCC Representative will be tested by dynamic testing with CAPWAP analysis. If the factored bearing capacity of the tested piles is less than the factored geotechnical resistance specified on drawings at ultimate limit state (ULS) for a dynamic test, Contractor shall do appropriate corrections to reach the required capacity and realise again a serie of dynamic tests on three (3) piles per foundation. If the capacity is still not reached, Contractor shall repeat the process until the required capacity is reached for three (3) tests.

.4 Test validity determined by NCC Representative.

3.4 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

FIN DE SECTION

PART 1 - GENERAL

1.1 PRICE AND PAYMENT PROCEDURE

.1 Works for the current section are included in the works and the cost of the trees. Costs included, but not limited to, material, material required for fire prevention and fire protection, mechanical chipping, site preparation, forest cover restauration, equipment, and all incident expenses.

1.2 STORAGE AND PROTECTION

.1 Provide public protection and prevent damage to fencing, trees, landscaping, natural features, bench marks utility lines, water courses, and root systems of trees which are to remain as well as public way.
.1 Repair damaged items to approval of NCC Representative.
.2 Replace trees ded to remain, if damaged, as directed by NCC Representative.

PART 2 - PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 - EXECUTION

3.1 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.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL (Suite)

.3 Remove erosion and sedimentation controls, restore and stabilize areas disturbed during removal.

3.2 PREPARATION

.1 Inspect site and verify with NCC Representative, items designated to remain.

3.3 CLEARING

.1 Clearing includes felling, trimming, and cutting of trees into sections and satisfactory disposal of trees and other vegetation designated for removal, including downed timber, snags, brush, and rubbish occurring within cleared areas.

.2 Clear as NCC Representative, by cutting 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 1000 mm above ground surface.

.3 Cut off branches and cut down trees overhanging area cleared as directed by NCC Representative.

.4 Cut off unsound branches on trees designated to remain as directed by NCC Representative.

3.4 CLOSE CUT CLEARING

.1 Close cut clearing to ground level to within 100 mm of ground surface.

.2 Cut off branchesanddown trees overhanging area cleared as directed by NCC Representative.

.3 Cut off unsound branches on trees designated to remain as directed by NCC Representative.

3.5 UNDERBRUSH CLEARING

.1 Clear underbrush from areas as indicated at ground level.

3.6 GRUBBING

.1 Remove and dispose of roots larger than 7.5 cm in diameter, matted roots, and designated stumps from indicated grubbing areas.

.2 Grub out stumps and roots to not less than 200 mm below ground surface.

.3 Fill depressions made by grubbing with suitable material and to make new surface conform with existing adjacent surface of ground.

3.7 FINISHED SURFACE

.1 Leave ground surface in condition suitable for immediate grading operations to approval of NCC Representative.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

FIN DE SECTION

PART 1 - GENERAL

1.1 REFERENCES

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

.1 ASTM C 117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.

.2 ASTM C 136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.

.3 ASTM D 422-632002, Standard Test Method for Particle-Size Analysis of Soils.

.4 ASTM D 698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft ^{3}) (600 kN-m/m ^{3}).

.5 ASTM D 1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft ^{3}) (2,700 kN-m/m ^{3}).

.6 ASTM D 4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

.2 Canadian General Standards Board (CGSB)

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

.2 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-03, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.1 CSA-A3001-03, Cementitious Materials for Use in Concrete.

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

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Preconstruction Submittals:

1.2 ACTION AND INFORMATIONAL SUBMITTALS (Suite)

.2 (Suite)
.1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
.2 Submit records of underground utility locates, indicating: location plan of existing utilities as found in field.

1.3 QUALITY ASSURANCE

.1 Qualification Statement: submit proof of insurance coverage for professional liability.

.2 Engage services of qualified professional Engineer who is registered or licensed in Province, Canada in which Work is to be carried out to design and inspect cofferdams, shoring, bracing and underpinning required for Work.

.3 Do not use soil material until written report of soil test results are reviewed and approved by NCC Representative.

.4 Health and Safety Requirements:
.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.4 EXISTING CONDITIONS

.1 Examine soil report.

.2 Buried services:
.1 Before commencing work verify and establish location of buried services on and adjacent to site.
.2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
.3 Remove obsolete buried services within 2 m of foundations: cap cut-offs.
.4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.

1.4 EXISTING CONDITIONS (Suite)

.2 (Suite)

.5 Prior to beginning excavation Work, notify applicable NCC Representative establish location and state of use of buried utilities and structures. NCC Representative to clearly mark such locations to prevent disturbance during Work.

.6 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.

.3 Surface features:

.1 Conduct, with NCC Representative, condition survey of trees and other plants, lawns, fencing, service poles, wires, pavement, survey bench marks, and monuments which may be affected by Work.

.2 Protect surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by NCC Representative.

.3 Where required for excavation, cut roots or branches in accordance with Section 32 01 90.33 - Tree and Shrub Preservation.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Type 1 and Type 2 fill: properties to Section 31 05 16 - Aggregate Materials and the following requirements:

.1 Crushed, pit run or screened stone, gravel or sand.

.2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.1 CAN/CGSB-8.2.

.3 Table:

Tamis Designation	% tamisat	
	Type 1	Type 2
75 mm	-	100
50 mm	-	-
37.5 mm	-	-
25 mm	100	-
19 mm	75 - 100	-
12.5 mm	-	-
9.5 mm	50 - 100	-
4.75 mm	30 - 70	22 - 85
2.00 mm	20 - 45	-
0.425 mm	10 - 25	5 - 30
0.180 mm	-	-
0.075 mm	3 - 8	0 - 10

.2 Backfill materials in accordance with BNQ : to Section 31 05 16 - Aggregate Materials.

.3 Geotextiles : to Section 31 32 19.01 - Geotextiles.

.4 Fill : selected material from excavation or other sources, approved by NCC Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.

PART 3 - EXECUTION

3.1 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.

.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.

3.2 SITE PREPARATION

.1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.

.2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 PREPARATION/ PROTECTION

.1 Protect existing features in accordance with Section 01 56 00 - Temporary Barriers and Enclosures and applicable local regulations.

.2 Keep excavations clean, free of standing water, and loose soil.

.3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to NCC Representative approval.

.4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.

.5 Protect buried services that are required to remain undisturbed.

3.4 STOCKPILING

.1 Protect fill materials from contamination.

.2 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries and into water bodies.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING

.1 Maintain sides and slopes of excavations in safe condition by appropriate methods and in accordance with Section 01 35 30 - Health and Safety Requirements.
.1 Where conditions are unstable, NCC Representative to verify and advise methods.

.2 Obtain permit from authority having jurisdiction for temporary diversion of water course.

.3 Construct temporary Works to depths, heights and locations as indicated.

.4 During backfill operation:
.1 Unless otherwise indicated or directed by NCC Representative, remove sheeting and shoring from excavations.

3.5 COFFERDAMS, SHORING, BRACING AND UNDERPINNING (Suite)

.4 (Suite)
.2 Do not remove bracing until backfilling has reached respective levels of such bracing.
.3 Pull sheeting in increments that will ensure compacted backfill is maintained at elevation at least 500 mm above toe of sheeting.

.5 When sheeting is required to remain in place, cut off tops at elevations as indicated.

.6 Upon completion of substructure construction:
.1 Remove cofferdams, shoring and bracing.
.2 Remove excess materials from site and restore watercourses as indicated and as directed by NCC Representative.

3.6 DEWATERING AND HEAVE PREVENTION

.1 Keep excavations free of water while Work is in progress.

.2 Provide for NCC Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.

.3 Avoid excavation below groundwater table if quick condition or heave is likely to occur.
.1 Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.

.4 Protect open excavations against flooding and damage due to surface run-off.

.5 Dispose of water in accordance with Section 01 35 43 - Environmental Procedures to approved collection and in manner not detrimental to public and private property, or portion of Work completed or under construction.
.1 Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.7 EXCAVATION

.1 Advise NCC Representative at least 7 days in advance of excavation operations for initial cross sections to be taken.

.2 Excavate to lines, grades, elevations and dimensions as indicated.

.3 Remove concrete, masonry, paving, walks, demolished foundations and rubble, and other obstructions encountered during excavation.

.4 Keep excavated and stockpiled materials safe distance away from edge of trench.

.5 Restrict vehicle operations directly adjacent to open trenches.

.6 Do not obstruct flow of surface drainage or natural watercourses.

.7 Obtain NCC Representative approval of completed excavation.

.8 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by NCC Representative.

.9 Install geotextiles in accordance with Section 31 32 19.01 - Geotextiles.

3.8 FILL TYPES AND COMPACTION

.1 Use types of fill as indicated. Compaction densities are percentages of maximum densities obtained from ASTM D 698 and ASTM D 1557 in accordance with Section 31 05 10 - Corrected Maximum Dry Density for Fill.

3.9 BACKFILLING

.1 Do not proceed with backfilling operations until completion of following:
.1 NCC Representative has inspected and approved installations.
.2 NCC Representative has inspected and approved of construction below finish grade.
.3 Inspection, testing, approval, and recording location of underground utilities.
.4 Removal of concrete formwork.

3.9 BACKFILLING (Suite)

.1 (Suite)
.5 Removal of shoring and bracing; backfilling of voids with satisfactory soil material.

.2 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.

.3 Do not use backfill material which is frozen or contains ice, snow or debris.

.4 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Backfilling around installations:
.1 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
.2 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
.1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from NCC Representative.

3.10 RESTORATION

.1 Upon completion of Work, remove waste materials and debris in accordance to Section 01 74 21 - Construction/Demolition Waste Management and Disposal, trim slopes, and correct defects as directed by NCC Representative.

.2 Replace topsoil as indicated.

.3 Reinstate lawns to elevation which existed before excavation.

.4 Reinstate pavements disturbed by excavation to thickness, structure and elevation which existed before excavation.

.5 Clean and reinstate areas affected by Work as directed by NCC Representative.

3.10 RESTORATION (Suite) .6 Protect newly graded areas from traffic and erosion and maintain free of trash or debris.

FIN DE SECTION

PART 1 - GENERAL

1.1 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Storage and Handling Requirements:
.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect geotextiles from direct sunlight and UV rays.
.3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIAL

.1 Geoxtextiles must comply with the requirements described in Tome 7 of the ministère des Transports du Québec.

.2 Geotextiles for pavement structure of the pathway: fabric needled non-weaven, supplied in rolls.
.1 Tensil strenght: minimum 400 N
.2 Elongation at break: minimum 15 %
.3 Apparent opening size (AOS): to ASTM D 4751, 150 micrometres.

.3 Other geotextiles project
.1 Rupture resistance: minimum 1000 N
.2 Elongation at break: minimum 15 %
.3 Apparent opening size (AOS): to ASTM D 4751, 150 micrometres.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated.

3.1 INSTALLATION (Suite)

.2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.

.3 Place geotextile material on sloping surfaces in one continuous length from toe of slope to upper extent of geotextile.

.4 Overlap each successive strip of geotextile 300 mm over previously laid strip.

.5 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.

.6 After installation, cover with overlying layer within 4 hours of placement.

.7 Replace damaged or deteriorated geotextile to approval of NCC Representative.

3.2 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.

3.3 PROTECTION

.1 Vehicular traffic not permitted directly on geotextile.

FIN DE SECTION

PART 1 - GENERAL

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data: submit manufacturer's printed product literature, specifications and datasheet.

.3 Sub-surface investigation report: when site conditions differ from those indicated, submit written notification to NCC Representative and await further instructions.

.4 Submit schedule of planned sequence of driving to NCC Representative for review, as specified.

.5 Spliced piles: when authorized, submit design details of splice complete with signature and stamp of qualified professional engineer registered or licensed in Province of Quebec, Canada.

.6 Equipment:
.1 Submit prior to pile installation for approval by NCC Representative, list and details of equipment for use in installation of piles.
.2 Impact hammers: submit manufacturer's written data as specified.
.3 Non-impact methods; submit characteristics to evaluate performance.

.7 At least two (2) weeks prior to pile driving, Contractor shall supply to NCC Representative a detailed design note of the refusal used to evaluate the geotechnical resistance of the piles during pile driving. The design note shall take into account pile characteristic, driving material, and losses. Design note to be signed by an engineer licensed by the Ordre des ingénieurs du Québec.

.8 Submit driveability analysis as specified, to NCC Representative for approval of hammers.

1.1 ACTION AND INFORMATIONAL SUBMITTALS (Suite)

.9 Quality assurance submittals:
.1 Test reports: submit three (3) copies of certified test reports for piles from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.
.2 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

1.2 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and manufacturer's instructions.

.2 Protect piles from damage due to excessive bending stresses, impact, abrasion or other causes during delivery, storage and handling.

.3 Replace damaged piles as directed by NCC Representative.

1.3 EXISTING CONDITIONS

.1 Sub-surface investigation report is bound into specification.

.2 Notify NCC Representative in writing if subsurface conditions at site differ from those indicated and await further instructions from NCC Representative.

1.4 SCHEDULING

.1 Provide schedule of planned sequence of driving to NCC Representative for review, not less than two weeks prior to commencement of pile driving.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Type of piles and their material are presented on drawings.

2.1 MATERIALS
(Suite)

.2 Supply or fabricate full length piles as indicated and provide equipment to handle full length piles without cutting and splicing.

.3 Splice piles only with written authorization of NCC Representative.
.1 When permitted, provide details for NCC Representative review.
.2 Design details of splice to bear dated signature stamp of professional engineer registered or licensed in Province of Quebec, Canada.

2.2 EQUIPMENT

.1 Impact hammers: provide manufacturer's name, type, rated energy per blow at normal working rate, mass of striking parts of hammer, mass of driving cap and type and elastic properties of hammer and pile cushions.

.2 Hammer:
.1 Hammers to be selected on basis of driveability analysis using wave equation theory, performed to show that piles can be driven to levels indicated.
.2 Driveability analysis to include, but not be limited to, following: hammer, cushion, and cap block details; static soil parameters; quake and damping factors, total soil resistance, blow count, pile stresses and energy throughput at representative penetrations.
.3 When required criteria can not be achieved with the proposed hammer, use larger hammer and take other measures as required.

PART 3 - EXECUTION

3.1 PREPARATION

.1 Protection:
.1 Protect adjacent structures, services and work of other sections from hazards due to pile driving operations.
.2 Arrange sequencing of pile driving operations and methods to avoid damages to adjacent existing structures.

3.1 PREPARATION (Suite)

.1 (Suite)
.3 When damages occur, remedy damaged items to restore to original or better condition at own expense.

.2 Ensure that ground conditions at pile locations are adequate to support pile driving operation and load testing operation.
.1 Make provision for access and support of piling equipment during performance of Work.

.3 Drive piles only when excavation has been completed.

.4 Drive piles within embankments only when embankment has been placed and compacted to at least bottom elevation of pile cap.

.5 Pre-boring of holes may be acceptable to facilitate pile alignment control.

3.2 INSTALLATION

.1 Required minimum factored geotechnical capacity at ultimate limite state (ULS) is indicated on drawings.

.2 Installation of each pile will be subject to approval of NCC Representative.
.1 NCC Representative will be sole judge of acceptability of each pile with respect to final driving resistance, depth of penetration or other criteria used to determine load capacity.

.3 Drive each pile to at least reach refusal, as established by the Contractor engineer in order to reach the minimum required resistance, in accordance with CAN/CSA-S6, Canadian Highway Bridge Design Code.
.1 Before reaching refusal, drive piles without interruption to avoid pile locking in soil.
.2 In addition to refusal, the Contractor shall also make sure that the length of each pile is at least the length indicated on drawings (under the concrete pile cap).

3.3 APPLICATION / DRIVING

.1 Use driving caps and cushions to protect piles.
.1 Reinforce pile heads as required by NCC Representative.
.2 Piles with damaged heads as determined by NCC Representative will be rejected.

.2 Hold piles securely and accurately in position while driving.

.3 Deliver hammer blows along axis of pile.

.4 All piles shall be re-driving after a relaxation delay, as indicated on drawings.

.5 Remove loose and displaced material from around piles after completion of driving, and leave clean, solid surfaces.

.6 Cut off piles neatly and squarely at elevations as indicated.
.1 Provide sufficient length above cut-off elevation so that part damaged during driving is cut off.
.2 Do not cut tendons or other reinforcement, which will be used to tie pile caps to pile.

.7 Remove cut-off lengths from site on completion of work.

3.4 DRIVING TOLERANCES

.1 Pile heads to be within 100 mm of locations as indicated.

.2 Piles not to be more than 1 % of length out of vertical alignment.

3.5 OBSTRUCTIONS

.1 Where obstruction is encountered that causes sudden unexpected change in penetration resistance or deviation from specified tolerances, proceed as directed by NCC Representative.

3.6 REPAIR AND RESTORATION

.1 Pull out rejected piles and replace with new piles.

.2 No extra compensation will be made for removing and replacing or other work made necessary through rejection of defective piles.

3.7 FIELD QUALITY CONTROL

.1 Dynamic test reports and CAPWAP analysis are required. Contractor shall wait a minimum delay before realising them, in compliance with notes on drawings and to section 31 09 16.28 - Pile Tests.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

FIN DE SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 31 09 16.28 - Piles Tests.

.2 Section 31 61 13 - Foundations, General Requirements.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

.1 CSA W47.1-09 (R004), Certification of Companies for Fusion Welding of Steel Structures.

.2 CSA G30.18-09 (2014), Carbon Steel Bars for Concrete Reinforcement.

.3 CSA-G40.20/G40.21-2013, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.

.4 CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.

.5 CSA W59-2013, Welded Steel Construction (Metal Arc Welding).

.6 CSA-W186-M1990 (R2012, Welding of Reinforcing Bars in Reinforced Concrete Construction.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit shop drawings and indicate: pile shoes, driving caps, pile embedment (including welded rebar).

.1 Each drawing signed by qualified professional engineer registered or licensed in Quebec, Canada.

.3 Quality Assurance:

.1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.2 Submit pile driving records, as described in PART 3 - RECORDS, for review by NCC Representative.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused metal materials from landfill to metal recycling facility as approved by NCC Representative.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Steel H piles: to CSA-G40.20/G40.21, Type and Grade 350W.
.1 Size and weight as indicated in drawings.

.2 Welding materials: to CSA W48.

.3 Steel plates for pile embedment: to CSA-G40.20/G40.21, Type and grade 350W.

.4. Reinforcing steel for pile embedment: to CSA-G38.18, Type and grade 400W.

.5 Pile driving shoes: to CSA-G40.20/G40.21, Grade 350W.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install piling in accordance with Section 31 61 13 - Pile Foundations, General Requirements.

.2 Provide driving caps and pile number as directed by NCC Representative.

.3 Contractor shall take into account the potential rebound of the surrounding piles during driving; use appropriate approach to reduce and limit it (by using restraining device, by considering a waiting time and/or an appropriate driving sequence) in order not to affect its productivity.

.4 Cut off piles squarely at required elevation.

3.2 WELDING

.1 Weld to CSA W59.

.2 Welding certification of companies: to CSA W47.1.

3.3 BRACING FOR STEEL PILE BENTS

.1 Connect structural steel sway bracing as indicated before placing caps.

.2 Provide fills and shims between bracing and pile as directed by NCC Representative.

3.4 RECORDS

.1 Keep complete and accurate record of each pile driven.

.2 Indicate:
.1 Pile location.
.2 Deviations from design location.
.3 Cross section shape and dimensions.
.4 Original length.
.5 Ground elevation.
.6 Tip elevation.
.7 Cutoff elevation.
.8 Penetration in blows per meter for entire length of penetration.
.9 Hammer data including: rate of operation, make and size.
.10 Unusual pile behavior or circumstances experienced during driving such as redriving, heaving, weaving, obstructions, jetting, and unanticipated interruptions.

3.5 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

FIN DE SECTION

PART 1 - GENERAL

1.1 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 ASTM International
.1 ASTM A 1064/A 1064M-13, Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
.2 CSA Group
.1 CSA G30.18-09, Carbon Steel Bars for Concrete Reinforcement.
.3 Department of Justice Canada (Jus)
.1 Canadian Environmental Protection Act (CEPA), 1999, c. 33.
.2 Fertilizers Act (R.S. 1985, c. F-10).
.3 Fertilizers Regulations (C.R.C., c. 666).
.4 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.
.4 Health Canada - Pest Management Regulatory Agency (PMRA)
.1 National Standard for Pesticide Education, Training and Certification in Canada (1995).
.5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

1.2 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:
.1 Obtain approval from NCC Representative of schedule indicating beginning of Work.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

1.3 ACTION AND INFORMATIONAL SUBMITTALS (Suite)

.2 (Suite)
.1 Submit manufacturer's instructions, printed product literature and data sheets for tree and shrub preservation materials and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:
.1 Store materials off ground and in accordance with manufacturer's recommendations.
.2 Store and protect tree and shrub preservation materials from nicks, scratches, and blemishes.
.3 Replace defective or damaged materials with new.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Fill:
.1 Fill material BNQ, see section 31 05 16 - Aggregate Material and refer to information specified on drawings.
.2 Type (A): clean, natural river sand and gravel material, free from silt, clay, loam, friable or soluble materials and organic matter.
.3 Type (B): excavated pervious soil, free from roots, rocks larger than 75 mm, building debris, and toxic ingredients (salt, oil, etc). Excavated material shall be approved by NCC Representative before use as fill.

2.1 MATERIALS (Suite)

.2 Coarse washed stones: 35-75 mm diameter clean round hard stone.

.3 Draintile: 100 mm diameter corrugated recycled content plastic perforated tubing complete with snap couplings. Fill vents with 20 mm clear stone.

.4 Peatmoss:
.1 Derived from partially decomposed species of Sphagnum Mosses.
.2 Elastic and homogeneous.
.3 Free of wood and deleterious material which could prohibit growth.
.4 Shredded minimum particle size: 5 mm.

.5 Fertilizer:
.1 To Canada Fertilizer Act and Fertilizers Regulations.
.2 Complete, commercial, slow release with 35% of nitrogen content in water-insoluble form.

.6 Anti-desiccant: commercial, wax-like emulsion.

.7 Filter Cloth:
.1 Type 1: 100 % non-woven needle punched polyester, 2.75 mm thick, 240 g/m^2 mass.
.2 Type 2: biodegradable burlap.

.8 Posts : 38 x 89 x 2400 mm length, untreated wood.

.9 Welded wire fabric (WWF): 102 x 102 mm, MW 18.7 x MW 18.7, to ASTM A 1064/A 1064 Mand CSA G30.18.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for tree and shrub preservation installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of NCC Representative.

3.1 EXAMINATION (Suite)

.1 (Suite)
.2 Inform NCC 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 NCC Representative.

3.2 IDENTIFICATION AND PROTECTION

.1 Identify plants and limits of root systems to be preserved as approved by NCC Representative.

.2 Protect plant and root systems from damage, compaction and contamination resulting from construction as approved by NCC Representative.

.3 Ensure no pruning is done inside drip line. If pruning inside drip line is required consult an arborist or Canadian Certified Horticultural Technician (CCHT) as approved by NCC Representative.

3.3 ROOT CURTAIN SYSTEM

.1 Identify limits for required construction excavation as approved by NCC Representative.

.2 Prior to construction excavation, hand dig trench minimum 500 mm wide x 1500 mm deep, along perimeter of excavation limits.

.3 Prune exposed roots cleanly at side of trench nearest plants to be preserved. Pruned ends to point obliquely downwards.

.4 Install posts and welded wire fabric against construction edge of trench.

.5 Securely attach Type 2 filter fabric on plant side of wire mesh.

.6 Prepare homogeneous mixture of fertilizer, parent material and organic matter.
.1 Add organic matter to mixture to achieve 7-9% organic matter content by weight.
.2 Incorporate with mixture grade 2:12:8 ratio fertilizer (dry) at rate of 1.5 kg/m^3.

3.3 ROOT CURTAIN SYSTEM (Suite)

.7 Backfill with homogeneous mixture between curtain wall and plants to be preserved in layers not exceeding 150 mm in depth. Compact each layer to 85% Standard Proctor Density.

.8 Protect root curtain from damage during construction operations.

.9 Water plants and root curtain sufficiently during construction to maintain optimum soil moisture condition until backfill operations are complete.

.10 Protect root curtain before during backfill operations. Ensure root curtain is cut down to 300 mm below finished grade and remove cut material.

3.4 AIR LAYERING SYSTEM

.1 Using manual methods, carefully remove turf, plants, leaves and organic matter in area of root system, dispose of plant matter through compost site and slightly loosen topsoil surface. Avoid damage to root system.

.2 Lay horizontal system of perforated recycled content drain pipe on surface of existing grade.
.1 Slope drain tile minimum 3% for drainage away from trunk of tree.
.2 Connect system with general site drainage system or drain to low point on site.

.3 Install recycled content plastic vent pipes vertically over joints in horizontal pipe system or where indicated. Top of vent pipe to be 20 mm above finished grade of fill. Keep top of vent pipe covered during construction.

.4 Cover joints with Type 1 filter fabric and place coarse washed stone around joints and vertical pipes to secure their position.

.5 Construct drywell around trunk of tree.
.1 Ensure open ends of horizontal pipe system vertical vent pipes are left exposed for air circulation to root system.

3.4 AIR LAYERING SYSTEM (Suite)

.5 (Suite)
.2 Protect openings from blockage during construction.
.3 Install protective caps on exposed horizontal openings.

.6 Place 200 mm depth of coarse washed stone on surface of original ground and horizontal pipe system to limits.

.7 Place Type 1 filter fabric over surface of granular layer.

.8 Place Type A fill over filter fabric to required depth without disturbing or damaging drain pipe system. Avoid damage to filter fabric.

.9 Complete topsoil and sodding finished paving over area of sub-surface system within weeks of placing fill.

.10 Remove temporary protective covering from vent pipe openings. Install protective caps flush with finished grade.

3.5 TRENCHING AND TUNNELING FOR UNDERGROUND SERVICES

.1 Centre line location and limits of trench/tunnel excavation to be approved by NCC Representative prior to excavation. Tunnel excavation to extend 2000 mm from edge of trunk on either side.

.2 Excavate manually within zone of root system. Do not sever roots greater than 40 mm diameter except at greater than 500 mm below existing grade. Protect roots, and cut roots cleanly with sharp disinfected tools.

.3 Excavate tunnel under centre of tree trunk using methods and equipment approved by NCC Representative.

.4 Minimum acceptable depth to top of tunnel: 1000 mm.

.5 Backfill for tunnel and trench to 85% Standard Proctor Density. Avoid damage to trunk and roots of tree.

3.5 TRENCHING AND TUNNELING FOR UNDERGROUND SERVICES (Suite)

.6 Complete tunnelling and backfilling at tree within 2 weeks of beginning Work.

3.6 LOWERING GRADE AROUND EXISTING TREE

.1 Begin Work in accordance with schedule approved by NCC Representative.

.2 Cut slope not less than 500 mm from tree trunk to new grade level retaining wall.

.3 Excavate to depths as indicated. Protect from damage root zone which is to remain.

.4 When severing roots at excavation level, cut roots with sharp tools.

.5 Cultivate excavated surface manually to 15 mm depth.

.6 Prepare homogeneous soil mixture consisting by volume of:
.1 60% excavated soil cleaned of roots, plant matter, stones, debris.
.2 25% coarse, clean sterile sand.
.3 15% organic matter.
.4 Grade 2:12:8 fertilizer at rate of 1.5 kg/m^3.

.7 Place soil mixture over area of excavation to finished grade level. Compact to 85% Standard Proctor Density.

.8 Water entire root zone to optimum soil moisture level.

.9 Install surface cover of seeding and sodding in accordance with Section Section 32 92 19.16 - Hydraulic Seeding.

3.7 PRUNING

.1 Prune in accordance with Section 32 93 43.01 - Tree Pruning.

3.7 PRUNING (Suite)

.2 Prune crown to compensate for root loss while maintaining general form and character of plant. Dispose of debris through alternative disposal, composting, and mulching.

3.8 ANTI-DESICCANT

.1 Apply anti-desiccant to foliage where applicable and as directed by NCC Representative.

3.9 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.

FIN DE SECTION

PART 1 - GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 Measure granular base in square metre of material in place. Will be taken into account only material incorporated into Work.

1.2 REFERENCES

.1 BNQ - Bureau de normalisation du Québec
.1 BNQ 2560-114/2014, Travaux de génie civil- Granuat.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 31 05 16 - Aggregate Materials and with manufacturer's written instructions.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Granular base for cycle path: material in accordance with Section 31 05 16 - Aggregate Materials and following requirements:
.1 Crushed stone or gravel, MG 20 according to intrinsic and production standard mentioned in BNQ 2560-114.

PART 3 - EXECUTION

3.1 PLACEMENT AND INSTALLATION

.1 Level and compact the existing soil to 93% of modified Proctor.

.2 Place granular base after subgrade surface is inspected and approved in writing by NCC Representative.

.3 Placing:
.1 Construct granular base to depth and grade in areas indicated.
.2 Ensure no frozen material is placed.

3.1 PLACEMENT AND INSTALLATION (Cont'd)

.3 (Cont'd)

.3 Place material only on clean unfrozen surface, free from snow and ice.

.4 Place material using methods which do not lead to segregation or degradation of aggregate.

.5 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.

.1 NCC Representative may authorize thicker lifts (layers) if specified compaction can be achieved.

.6 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.7 Remove and replace that portion of layer in which material becomes segregated during spreading.

.4 Compaction Equipment:

.1 Ensure compaction equipment is capable of obtaining required material densities.

.5 Compacting:

.1 Compact to density not less than 98% corrected maximum dry density.

.2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.

.3 Apply water as necessary during compacting to obtain specified density.

.4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by NCC Representative.

.5 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

3.2 SITE TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low. However, on bridge approach, base surface to be within plus or minus 5 mm.

3.3 PROTECTION

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied or until acceptance by NCC Representative.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT AND PAYMENT

.1 Measure asphalt concrete paving in tonnes of asphalt concrete actually incorporated into Work.

1.2 REFERENCES

.1 MTQ - Ministère des Transports du Québec
.1 Norme 4101 - Bitumes, Tome VII - Matériaux de la collection des normes Ouvrages routiers.
.2 Norme 4202 - Enrobés à chaud formulés selon la méthode de formulation du Laboratoire des chaussées, Tome VII - Matériaux de la collection des normes Ouvrages routiers.

.2 BNQ - Bureau de normalisation du Québec
.1 BNQ 2560-114, Travaux de génie civil - Granulats.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C 2 weeks prior to beginning Work.

.3 Samples:
.1 Inform NCC Representative of proposed source of aggregates and provide access for sampling 4 weeks prior to beginning Work.
.2 Submit samples of following materials proposed for use 4 weeks prior to beginning Work.
.1 One 5 L container of asphalt cement.

1.3 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.3 (Cont'd)
.2 (Cont'd)

.4 Test and Evaluation Reports:

.5 Certificates:
.1 Certification to be marked on pipe.

.6 Test and Evaluation Reports:
.1 Submit manufacturer's test data and certification that asphalt cement meets specification requirements.
.2 Submit manufacturer's test data and certification that hydrated lime meets specified requirements.
.3 Submit asphalt concrete mix design and trial mix test results to NCC Representative for review at least 4 weeks prior to beginning Work.
.4 Submit printed record of mix temperatures at end of each week.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Deliver and stockpile aggregates in accordance with Section 31 05 16 - Aggregate Materials and erosion and sedimentation control plan. Stockpile minimum 50 % of total amount of aggregate required before beginning asphalt mixing operation.

.3 When necessary to blend aggregates from one or more sources to produce required gradation, do not blend in stockpiles.

.4 Stockpile fine aggregate separately from coarse aggregate, although separate stockpiles for more than two mix components are permitted.

.5 Provide approved storage, heating tanks and pumping facilities for asphalt cement.

.6 Submit to NCC Representative copies of freight and waybills for asphalt cement as shipments are received.

1.4 DELIVERY, STORAGE AND HANDLING (Cont'd)

.6 (Cont'd)
.1 NCC Representative reserves right to check weights as material is received.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Performance graded asphalt cement: to 4101, Tome VII - MTQ, Grade PG 58-28.

.2 Aggregates: in accordance with Section 31 05 16 - Aggregate Materials: General and requirements as follows:
.1 Crushed stone or gravel.
.2 In accordance with BNQ 2560-114.

.3 Mineral filler:
.1 Ensure finely ground particles of limestone, hydrated lime, Portland cement or non-plastic mineral matter are thoroughly dry and free from lumps.
.2 Add mineral filler when necessary to meet job mix aggregate gradation or as directed to improve mix properties.
.3 Ensure mineral filler is dry and free flowing when added to aggregate.

.4 Water: to approval of NCC Representative.

2.2 EQUIPMENT

.1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.

.3 Vibratory rollers:
.1 Drum diameter: 1200 mm minimum.
.2 Amplitude of vibration (machine setting): 0.5 mm maximum for lifts less than 40 mm thick.

2.2 EQUIPMENT (Cont'd)

.4 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:
.1 Boxes with tight metal bottoms.
.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.
.3 In cool weather or for long hauls, insulate entire contact area of each truck box.
.4 Use only trucks which can be weighed in single operation on scales supplied.

.5 Hand tools:
.1 Lutes or rakes with covered teeth for spreading and finishing operations.
.2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm^2 for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by NCC Representative, may be used instead of tamping irons.
.3 Straight edges, 4.5 m in length, to test finished surface.

2.3 MIX DESIGN

.1 Mix design to beapproved in writing by NCC Representative.

.2 Mix design to be developed by testing laboratory approved in writing by NCC Representative.

.3 Design of mix: by Pavement Laboratory method (MTQ). .1
.1 Do not change job-mix without prior approval of NCC Representative. When change in material source proposed, new job-mix formula to be approved by NCC Representative.
.2 Return plant dust collected during processing to mix in quantities acceptable to NCC Representative.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving in accordance with manufacturer's written instructions.
.1 Visually inspect substrate.
.2 Inform NCC 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 NCC Representative.

3.2 PLANT AND MIXING REQUIREMENTS

.1 Batch and continuous mixing plants:
.1 To ASTM D 995.
.2 Feed aggregates from individual stockpiles through separate bins to cold elevator feeders.
.1 Do not load frozen materials into bins.
.3 Feed cold aggregates to plant in proportions to ensure continuous operations.
.4 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.
.5 Before mixing, dry aggregates to moisture content not greater than 1 % by mass or to lesser moisture content if required to meet mix design requirements.
.6 Immediately after drying, screen aggregates into hot storage bins in sizes to permit recombining into gradation meeting job-mix requirements.
.7 Store hot screened aggregates in manner to minimize segregation and temperature loss.
.8 Heat asphalt cement and aggregate to mixing temperature directed by NCC Representative. Do not heat asphalt cement above maximum temperature indicated on temperature-viscosity chart.

3.2 PLANT AND MIXING REQUIREMENTS (Cont'd)

.1 (Cont'd)

.9 Make available current asphalt cement viscosity data at plant. With information relative to viscosity of asphalt being used, NCC Representative to approve temperature of completed mix at plant and at paver after considering hauling and placing conditions.

.10 Maintain temperature of materials within 5 degrees C of specified mix temperature during mixing.

.11 Mixing time:

.1 In batch plants, both dry and wet mixing times as directed by NCC Representative. Continue wet mixing as long as necessary to obtain thoroughly blended mix but not less than 30s or more than 75s.

.2 In continuous mixing plants, mixing time as directed by NCC Representative but not less than 45s.

.2 Dryer drum mixing plant:

.1 To ASTM D 995.

.2 Load aggregates from individual stockpiles to separate cold feed bins. Do not load frozen materials into bins.

.3 Feed aggregates to burner end of dryer drum by means of multi-bin cold feed unit and blend to meet job-mix requirements by adjustments of variable speed feed belts and gates on each bin.

.4 Meter total flow of aggregate using electronic weigh belt system with indicator that can be monitored by plant operator and which is interlocked with asphalt pump to ensure proportions of aggregate and asphalt entering mixer remain constant.

.5 Allow for easy calibration of weighing systems for aggregates without having material enter mixer.

.6 Calibrate bin gate openings and conveyor speeds to ensure mix proportions are achieved.

.1 Calibrate weigh bridge on charging conveyor by weighing amount of aggregate passing over weigh bridge in set amount of time.

.2 Difference between this value and amount shown by plant computer system to differ by not more than plus or minus 2 %.

3.2 PLANT AND MIXING REQUIREMENTS (Cont'd)

.2 (Cont'd)

.6 (Cont'd)

.7 Make provision for conveniently sampling full flow of materials from cold feed.

.8 Provide screens or other suitable devices to reject oversize particles or lumps of aggregate from cold feed prior to entering drum.

.9 Provide system interlock stop on feed components if either asphalt or aggregate from bin stops flowing.

.10 Accomplish heating and mixing of asphalt mix in approved parallel flow dryer-mixer in which aggregate enters drum at burner end and travels parallel to flame and exhaust gas stream.

.1 Control heating to prevent fracture of aggregate or excessive oxidation of asphalt.

.2 Equip system with automatic burner controls and provide for continuous temperature sensing of asphalt mixture at discharge, with printing recorder that can be monitored by plant operator.

.3 Submit printed record of mix temperatures at end of each day.

.11 Ensure mixing period and temperature to produce uniform mixture in which particles are thoroughly coated, and moisture content of material as it leaves mixer is 2 % maximum.

.3 Temporary storage of hot mix:

.1 Provide mix storage of sufficient capacity to permit continuous operation and designed to prevent segregation.

.2 Do not store asphalt mix in storage bins in excess of 3 hour.

.4 While producing asphalt mix for this Project, do not produce mix for other users unless separate storage and pumping facilities are provided for materials supplied to this project.

.5 Mixing tolerances:

.1 Permissible variation in aggregate gradation from job mix (percent of total mass)in accordance with BNQ 2560-114 and 4202 standards.

3.2 PLANT AND MIXING REQUIREMENTS (Cont'd)

.5 (Cont'd)
.2 Permissible variation of asphalt cement from job mix: in accordance with 4202 standard.
.3 Permissible variation of mix temperature at discharge from plant: in accordance with 4202 standards.

.6 Addition of anti-stripping agent:
.1 Plant to be equipped with pug mill to thoroughly mix aggregates and lime prior to entering the plant.
.2 Plant to be equipped with suitable conveyor systems capable of supplying aggregates and lime at constant rate.
.3 Plant and equipment used for addition of lime to be equipped with covers to control loss of lime.
.4 Plant to be equipped to control rate of lime incorporation to within 1/4%.
.5 Add water to aggregate prior to entering pug mill.
.6 Add water to lime sufficiently in advance to permit time to slake prior to entering pug mill.

3.3 PREPARATION

.1 Reshape granular roadbed.

.2 Prior to laying mix, clean surfaces of loose and foreign material.

3.4 TRANSPORTATION OF MIX

.1 Transport mix to job site in vehicles cleaned of foreign material.

.2 Schedule delivery of material for placing in daylight.

.3 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation.
.1 Do not dribble mix into trucks.

.4 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.

3.4 TRANSPORTATION OF MIX (Cont'd)

.5 Deliver loads continuously in covered vehicles and immediately spread and compact.
.1 Deliver and place mixes at temperature within range as directed by NCC Representative, but not less than 135 degrees C.

3.5 PLACING

.1 Obtain NCC Representative's approval of existing surface prior to placing asphalt.

.2 Place asphalt concrete to thicknesses, grades and lines as indicated.

.3 Placing conditions:
.1 Place asphalt mixtures only when air temperature is 5 degrees C minimum.
.2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.
.3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

.4 Place asphalt by layer of thickness as indicated.

.5 Where possible do tapering and levelling where required in lower lifts. Overlap joints by not less than 300 mm.

.6 Place individual strips no longer than 500 m.

.7 On airport runways and taxiways, aprons and parking lots commence spreading at high side of pavement or at crown and span crowned centerlines with initial strip.

.8 Spread and strike off mixture with self propelled mechanical finisher.
.1 Construct longitudinal joints and edges true to line markings.
.2 Maintain constant head of mix in auger chamber of paver during placing.
.3 If segregation occurs, immediately suspend spreading operation until cause is determined and corrected.

3.5 PLACING (Cont'd)

.8 (Cont'd)

.4 Correct irregularities in alignment left by paver by trimming directly behind machine.

.5 Correct irregularities in surface of pavement course directly behind paver.

.1 Remove excess material forming high spots using shovel or lute.

.1 Fill and smooth indented areas with hot mix.

.2 Do not broadcast material over such areas.

.6 Do not throw surplus material on freshly screeded surfaces.

3.6 COMPACTING

.1 Roll asphalt continuously using established rolling pattern for test strip and to density of not less than 97 % of 75 blow Mashall density to to ASTM 1559.

.2 General:

.1 Provide at least 2 rollers and as many additional rollers as necessary to achieve specified pavement density. When more than 2 rollers are required, 1 roller must be pneumatic tired type.

.2 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.

.3 Operate roller slowly initially to avoid displacement of material. Do not exceed 5 km/h for breakdown and intermediate rolling for static steel-wheeled and pneumatic tired rollers. Do not exceed 9 km/h for finish rolling.

.4 Use static compaction for levelling coarse less than 25 mm thick.

.5 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.

.6 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.

.7 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.

3.6 COMPACTING (Cont'd)

.2 (Cont'd)

.8 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.

.9 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.

.10 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.

.1 Ensure that all points across width of pavement receive essentially equal numbers of passes of compactors.

.3 Breakdown rolling:

.1 Begin breakdown rolling with vibratory roller immediately following rolling of transverse and longitudinal joint and edges.

.2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.

.3 Operate breakdown roller with drive roll or wheel nearest finishing machine. When working on steep slopes or super-elevated sections use operation approved by NCC Representative.

.4 Use only experienced roller operators.

.4 Intermediate rolling:

.1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.

.2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.

.5 Finish rolling:

.1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks.

.1 If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by NCC Representative.

.2 Conduct rolling operations in close sequence.

3.7 JOINTS

.1 General:

.1 Remove surplus material from surface of previously laid strip.

.1 Do not deposit on surface of freshly laid strip.

.2 Construct joints between asphalt concrete pavement and Portland cement concrete pavement as indicated.

.3 Paint contact surfaces of existing structures such as manholes, curbs or gutters with bituminous material prior to placing adjacent pavement.

.2 Transverse joints:

.1 Offset transverse joint in succeeding lifts by at least 600 mm.

.2 Cut back to full depth vertical face and tack face with thin coat of hot asphalt prior to continuing paving.

.3 Compact transverse joints to provide smooth riding surface. Use methods to prevent rounding of compacted surface at joints.

.3 Longitudinal joints:

.1 Offset longitudinal joints in succeeding lifts by at least 150 mm.

.2 Cold joint is defined as joint where asphalt mix is placed, compacted and left to cool below 100 degrees C prior to paving of adjacent lane.

.1 For airfield runway paving, avoid cold joint construction in mid 30 m of runway.

.2 If cold joint can not be avoided, cut back by saw cutting previously laid lane, by at least 150 mm, to full depth vertical face, and tack face with thin coat of hot asphalt of adjacent lane.

.3 Overlap previously laid strip with spreader by 25 to 50 mm.

.4 Before rolling, carefully remove and discard coarse aggregate in material overlapping joint with lute or rake.

.5 Roll longitudinal joints directly behind paving operation.

.6 When rolling with static or vibratory rollers, have most of drum width ride on newly placed lane with remaining 150 mm extending onto previously placed and compacted lane.

3.7 JOINTS (Cont'd)

.4 Construct feather joints so that thinner portion of joint contains fine graded material obtained by changed mix design or by raking out coarse aggregate in mix.
.1 Place and compact joint to ensure joint is smooth and without visible breaks in grade.
.2 Locate feather joints as indicated.

.5 Construct butt joints as indicated.

3.8 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

3.9 DEFECTIVE WORK

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.
.1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 Repair areas showing checking, rippling, or segregation.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Requirements and procedures for installing precast concrete unit pavers by hand or with mechanical equipment.

1.2 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 32 11 16.01 – Pavement foundation layer

1.3 REFERENCES

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

- .1 ASTM C136-01, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
- .2 ASTM C979-99, Standard Specification for Pigments for Integrally Colored Concrete.

.2 Canadian Standards Association (CSA International).

- .1 CSA A23.1/A23.2-00, Concrete Materials and Methods of Concrete Construction/Method of Test for Concrete.
- .2 CSA A179-94, Mortar and Grout for Unit Masonry.
- .3 CSA-A231.2-95, Precast Concrete Pavers.
- .4 CSA A283-00, Qualification Code for Concrete Testing Laboratories.

1.4 SHOP DRAWINGS

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

.2 Indicate layout, pattern and relationship of paving joints to fixtures and project formed details and other specific details for the job.

1.5 SUBMITTALS

.1 Product Data:

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit following sampling and testing data:
  - .1 Sieve analysis for gradation of bedding and joint material.
  - .2 Unit paver sampling and testing.

.2 Samples:

- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit full size sample of standard size pavers.

.3 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.6 QUALITY ASSURANCE

.1 Qualifications:

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

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

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

1.7 MEASUREMENT PROCEDURES

.1 Measure precast concrete paving for payment in square metres.

Part 2 Products

2.1 CONCRETE PAVERS

.1 Concrete pavers: to CSA-A231.2 and as follows:

.1 Model : Permacon Melville Paver or approved equivalent
.2 Dimensions :
.3 Module A 80 mm x 190 mm x 380 mm.
.4 Module B 80 mm x 380 mm x 380 mm.
.5 Module C 80 mm x 380 mm x 570 mm.
.6 Shape : as indicate
.7 Color : Range Newport grey.
.8 Installation pattern : linear

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

.3 Pigment in concrete pavers: to ASTM C979.

2.2 BEDDING AND JOINT MATERIAL

.1 Determine bedding sand hardness as follows:

.1 Randomly select single 1.4 kg sample from sand source.
.2 Dry sample for 24 hours at 115 degrees C to 121 degrees C.
.3 Obtain 3 sub-samples each weighing 0.2 kg by passing original sample several times through riffle box.
.4 Carry out seive analysis test on each sub-sample in accordance with CSA 23.2.

.2 Remix each sub-sample and place in nominal 1 litre capacity porcelain jar with two 25 mm diameter steel ball bearings weighing 75 +/-5 g each. Rotate each jar at 50 rpm for six hours. Repeat sieve analysis. Record individual and average sieve analysis.

.3 For each sample tested, maximum increase in percentages passing each sieve and maximum individual percent passing is in accordance with table as follows:

Sieve Size	Max. Increase	Maximum Passing
0.075 mm	2%	2%
0.150 mm	5%	15%
0.300 mm	5%	35%

.4 Bedding and joint sand: clean, non-plastic, free from deleterious or foreign matter, natural or manufactured from crushed rock or gravel. Do not use limestone screenings or stone dust.

.5 Gradation: to CSA-A23.1, Table 4 - Grading Limits for Fine Aggregate, and CSA A179 as follows:

Sieve Designation	% Passing for Bedding Sand	Joint Sand
10 mm	[100]	
5 mm	[95-100]	[100]
2.5 mm	[80-100]	[95-100]
1.25 mm	[50-90]	[60-100]
630 microns	[25-65]	
600 microns		[35-80]
315 microns	[10-35]	
300 microns		[15-20]
160 microns	[2-10]	
150 microns		[2-15]

2.3 CLEANING COMPOUND

.1 Clear, organic solvent, designed and recommended by manufacturer for cleaning concrete pavers of contamination encountered.

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

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.2 STRUCTURAL SURFACE

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

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

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

3.3 PLACING OF BEDDING MATERIAL

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

.2 Spread and screed material on structural surface to achieve 25mm compacted thickness after vibrating pavers in place. Do not use joint sand for bedding sand.

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

3.4 INSTALLATION OF CONCRETE PAVERS

.1 Lay pavers to pattern[s] indicated. Joints between pavers: 2 to 5 mm wide, as recommended by manufacturer.

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

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

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

.5 Sweep dry joint sand material into joints.

.6 Settle sand by vibrating pavers with plate compactor.

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

.8 Complete installation to within 1 m of laying face, with sand-filled joints, at completion of each work day before any work-stoppage greater than 1 h.

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

.10 Proof roll street pavements with at least two passes of a 10 T rubber-tired roller.

.11 Final surface elevations not to exceed plus or minus 10 mm under 3 m long straightedge.

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

.13 Ensure conformance of final elevations.

3.5 CLEANING

.1 Remove and dispose of loose, extraneous materials from surfaces to be cleaned.

.2 Final surface to be free of contamination.

3.6 CLEANING

.1 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 MEASUREMENT FOR PAYMENT

.1 Pavement marking including reflective glass beads: measured in metres of solid lines, void exluded.

1.2 REFERENCES

.1 Environment Canada (EC)
.1 Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulations, SOR/2009-264.

.2 Green Seal (GS)
.1 GS-11-2013, Standard for Paints and Coatings.

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

.4 Master Painters Institute (MPI)
.1 Architectural Painting Specification Manual - current edition.
.1 MPI #32 Traffic Markings Paint, Alkyd.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's printed product literature and data sheets for pavement markings and include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 30 - Health and Safety Requirements01 35 43 - Environmental Procedures.

.3 Samples:
.1 Submit to NCC Representative following material sample quantities at least 4 weeks prior to commencing work.

1.3 ACTION AND INFORMATIONAL SUBMITTALS (Cont'd)

.3 (Cont'd)
.1 (Cont'd)
.1 Two 1 L samples of each type of paint.
.2 One 1 kg sample of glass beads.
.3 Sampling to MPI Painting Manual.
.2 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, MPI specification number and formulation number and batch number.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Paint and Markings:
.1 To MPI #32, Alkyd zone/traffic marking.
.2 Colour: to MPI listed, yellow.
.3 Upon request, NCC Representative will supply qualified product list of paints applicable to work. Qualified paints may be used but NCC Representative reserves right to perform further tests.

.2 Glass reflective beads: type suitable for application to wet paint surface for light reflectance.

PART 3 - EXECUTION

3.1 EXAMINATION

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

.2 Proceed with Work only after unacceptable conditions have been rectified.

3.2 EQUIPMENT REQUIREMENTS

.1 Paint applicator: approved pressure type mobile with positive shut-off distributor capable of applying paint in single, double and dashed lines and capable of applying marking components uniformly, at rates specified, and to dimensions as indicated.

3.2 EQUIPMENT REQUIREMENTS (Cont'd)

.2 Distributor: capable of applying reflective glass beads as overlay on freshly applied paint.

3.3 APPLICATION

.1 Pavement markings: laid out by NCC Representative lay out pavement markings.

.2 Unless otherwise approved by NCC Representative , apply paint only when air temperature is above 10 degrees C, wind speed is less than 60 km/h and no rain is forecast within next 4 hours.

.3 Apply traffic paint evenly at rate of 3 m^2 /L.

.4 Do not thin paint.

.5 Symbols and letters to dimensions indicated.

.6 Paint lines of uniform colour and density with sharp edges.

.7 Thoroughly clean distributor tank before refilling with paint of different colour.

.8 Apply glass beads at rate of 0.5 kg/L of painted area immediately after application of paint.

3.4 TOLERANCE

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

3.5 PROTECTION

.1 Protect pavement markings until dry.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 74 21

1.2 MEASUREMENT AND PAYMENT

.1 The term “fence” in the present section makes reference to the brige approach guardrails including the belvedere and excluding the bridge himself.

.2 Measure supply and erection of fence in metres erected

1.3 REFERENCES

.1 ASTM International

.1 ASTM A53/A53M-10, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

.2 ASTM A90/A90M-09, Standard Test Method for Weight Mass of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings.

.3 ASTM A121-07, Standard Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.

.4 A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM C618-08a, Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

.6 ASTM F1664-08, Standard Specification for Poly(Vinyl Chloride) (PVC)-Coated Steel Tension Wire Used with Chain-Link Fence.

.7 ASTM A123/A123M-09, Standard Specification for Zinc (Hot Dip Galvanized) coatings on Iron and Steel Products.

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 concrete mixes, fences, posts and gates and include product characteristics, performance criteria, physical size, finish and limitations.

1.5 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 in accordance with manufacturer's recommendations.

.2 Store and protect fence and gate materials from damage.

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

Part 2 Products

2.1 MATERIALS

.1 Concrete mixes and materials: in accordance with CSA A23.1 Section 03 30 00 - Cast-in-Place Concrete.

.2 Model choice by the client:

.1 Iron Eagle II series (commercial), model ELEGANT EAGLE II by Iron Eagle industries inc.

.2 Color: Black

.3 Height: 1.5m (5’) above ground

.4 With pyramid post cap

.5 Must include all hardware and accessories for final installation conform to the manufacturer recommendations.

.6 Refer to point 3.2 ERECTION OF FENCE for the (2) types of installations required.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrate previously installed under other Sections or Contracts are acceptable for fence and gate installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of NCC representative.

.2 Inform NCC 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 NCC representative

3.2 ERECTION OF FENCE

.1 Erect fence along lines as indicated on plans

.2 Provide welded steel plates at heel post for the fence sections that are to be installed on top of the concrete wall Redi-Rock type (see plan). Plates are to be fixed on top of concrete wall with tamper proof bolts (four bolts per plate).

.3 Provide 300mm dia. and 1500mm depth sonotube base for section of fencing that will not be fixed on top of concrete wall (see plan). Fencing post base must meet mentioned requirements and dimensions or as per directives from NCC representative.

.4 Installation must be executed in accordance with the manufacturer recommandations

3.3 CLEANING

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

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

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

.3 Waste Management: separate waste materials for reuse 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.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

.1 Current section deals with retaining walls to be installed at bridge approaches and at the lookout.

.2 Works related to retaining walls includes design, supply of required documents like shop drawings, and design notes, all labour, material, excavation, compacted backfill and equipments required in order to set up retaining walls.

1.2 TYPE OF WALL

.1 The retaining wall to be mechanically stabilized earth wall with geogrid inclusions and overlapping concrete blocks for walls having a height H of 1,2 meter and more (see drawings for more details). Although, for walls of less than 1,2 meter, it is possible that geogrids are not necessary depending of wall height and site conditions. In such case, the wall shall be a gravity wall with overlapping concrete blocks. Wall design to meet existing and future site conditions. Design will also meet requirements indicated on drawings. The two types of wall to come from the same manufacturer and to be the same model.

.1 Contractor to supply a sample to the NCC Representative at least four (4) weeks before the beginning of any wall set-up. Sample to meet requirements of Section 01 33 00 - Submittal Procedures.

.2 The wall to be a Redi-Rock wall, Ledgestone model or equivalent approved by the NCC Representative. NCC reserves the right to refuse a retaining wall model if it do not meet their esthetics criteria, their integration criteria with other similar structures on NCC properties or if it does not meet requirement specified in the contractual documents or if the structural capacity is insufficient.

.3 All geogrids must have a minimum ultimate tensile strength of 32 kN/m. All geogrids must also have a minimum cohesion between soil-geogrid of 10 kPa. In addition to geogrid length defined by the Contractor engineer, the length to be at least the minimum length specified on drawings.

1.3 REFERENCE

.1 All retaining wall works to be in conformity with the following standards:

.1 ASTM A325M-13, "Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric)".

.2 ASTM C881/C881M-13, "Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete".

.3 National Building Code 2010.

.4 CAN/BNQ 2501-255/2013, «Sols – Détermination de la relation teneur en eau-masse-volumique-Essai avec énergie de compactage modifiée (2700 kN*m/m³)».

.5 BNQ 2560–114, «Travaux de génie civil-Granulats », « Partie II : Fondation, sous-fondation, couche de roulement et accotement».

.6 BNQ-3624-110, «Tuyaux et raccords en polyéthylène (PE) - Tuyaux semi-rigides ou flexibles pour l'évacuation des eaux de ruissellement, le drainage des sols et les ponceaux - Caractéristiques et méthodes d'essais».

.7 BNQ-3624- 115, «Tuyaux et raccords en polyéthylène (PE) - Tuyaux flexibles pour le drainage».

.8 BNQ 7009-910, «Géotextiles – Qualité des géotextiles utilisés en génie routier – Protocole de certification».

.9 AASHTO LRFD "Bridge Design Specifications, SI Units, 6th Edition, with 2013 Interim Revisions".

.10 AASHTO T236, "Direct Shear Test of Soils Under Consolidated Drained Conditions".

.11 AASHTO T288, "Test for Determining Minimum Laboratory Soil Resistivity".

.12 AASHTO T289, "Test for Determining pH of Soil for Use in Corrosion Testing".

.13 AASHTO T290, "Test for Determining Water-Soluble Sulfate Ion Content in Soil".

.14 AASHTO T291, "Test for Determining Water-Soluble Chloride Ion Content in Soil".

.15 Norme 3101 of the Tome VII – Matériaux, Bétons de masse volumique normale, ministère des Transports du Québec.

.16 Norme 3403 of the Tome VII – Matériaux, Blocs remblais, ministère des Transports du Québec.

.17 Norme 13101 of the Tome VII – Matériaux, Géotextile, ministère des Transports du Québec.

.18 CAN/CSA S6, Canadian Highway Bridge Design Code.

.19 CSA G164-M92 (R2003), « Hot Dip Galvanizing of Irregularly Shaped Articles ».

1.4 DESIGN REQUIREMENTS

.1 Design of walls to be in accordance with the standard CAN/CSA S6 « Canadian Highway Bridge Design Code ». Each wall to be designed to resist to vertical loads induced by embankment, to live loads from the pathway and/or roadway, to seismic loads, to guardrail loads (where applicable), etc. wall Design to include loads due to embankment including soil slope behind the wall.

.2 Design will also take into account global geotechnical stability during works with the presence of cranes on top of retaining walls (according to Contractor method). Note that analysis for global geotechnical stability for permanent loading after construction (see appendix) do not include any live load. This concept and all concepts mentioned in the current section have to be part of the detailed design note.

.3 Retaining wall to be able to sustain loads from guard rail of a maximum height of 1,5 meter according to National Building Code 2010. Wall manufacturer to be certified that the retaining wall can sustain the guard rail, as per specifications, drawings and details of landscape architecture.

.4 Retaining wall design to meet in situ soil conditions. Geotechnical studies are included into the current tender documents (see appendices). Drilling logs indicate type and thickness of the layers only at specific locations where drilling occurred. Any interpretation from the drilling logs cannot be liable to the laboratory who did the drilling nor the Engineer nor the NCC.

.5 Contractor’s Engineer is fully responsible for the design of the retaining walls and the global stability analysis. In addition to the design by the Contractor’s Engineer, the geogrids to have a minimum length of 3 meters for the walls with a height H of 1,2 meter and more.

.6 Based on geotechnical report data, the Contractor Engineer to verify the ULS bearing capacity and to make sure that the retaining wall is able to take anticipated settlements.

.7 The buried depth is the height of the wall into the soil from the bottom of the wall to the level of the backfill in front of the wall corresponding to a horizontal plateau of a 1 meter minimum width (see drawings). The buried depth excludes the leveling footing or the bedding shown on drawings. For the project, the buried depth can be reduced to 400 mm according to manufacturer’s indications, with rigid insulation shown on drawings.

.8 Top of wall to exceed final soil level of at least 150 mm, unless noted otherwise. The first row of blocks, modules or other elements to always be installed horizontally for the entire wall length.

.9 When height is given on drawings or specifications, it is considering no batter and a wall thickness of zero. Contractor to determine the wall height required, considering the actual thickness at the top of the wall as well as its angle of inclination (batter).

.10 Contractor to take into account horizontal curves, skew and chainage equations in order to determine the actual wall length to erect.

.11 Metal inclusions within embankment, anchors and their embedment to have appropriate dimensions to resist the design loadings for the entire structure lifetime. Contractor to foresee additional thickness for these elements as per indications of the following table in order to compensate for the anticipated section loss due to corrosion. In addition to the values of the table, an increased thickness of 1 mm tobe added for metal elements buried within the top 2 m of a wall embankment being part of a road infrastructure.

.12 Contractor to foresee a drainage system to avoid water accumulation behind wall. The drainage system to take into account water table variation, Ottawa River Elevation, accidental leakage of the water supply system or wastewater system,
as well as upstream water level elevation indicated on drawings. Drainage system composed of either pipes going through wall blocks with one pipe every 10 m² of wall or horizontal drains composed of perforated pipes lined with geotextile and connected to a water discharge system.

1.5 SUBMITTALS INCLUDDDING SHOP DRAWINGS

.1 Contractor to submit a detailed design note, shop drawings and the construction specifications of the wall to erect at least 28 days before setting up any retaining wall on site; refer also to drawings for additional information. When lifting device are required for handling elements, shop drawings must describe them. Design note to be signed and other documents to be stamped and signed by an engineer licensed by the Ordre des ingénieurs du Québec. All these documents to be verified and signed by another engineer licensed by the Ordre des ingénieurs du Québec. Shop drawings to show final ground profiles on each side of the wall, as well as each block drawn to scale.

.2 Shop drawings to clearly identify the type of block to be used for each block. Distinguish block with two (2) finished sides, three (3) finished sides and four (4) finished sides, with or without backfill on the top block.

.3 Shop drawings to illustrate details used to take into account for the piles installed before the beginning of the retaining walls erection.

.4 Shop drawings to show if geogrids have to be anchored to bridge concrete abutments by illustrating the detail to be used, if required.

PART 2 – PRODUCTS

2.1 - GENERAL

.1 Retaining wall lifetime to be at least 75 years. Retaining wall steel elements must be galvanized.

2.2 GRANULAR MATERIAL FOR THE REINFORCED SOIL RETAINING WALL

Granular material for the reinforced soil retaining wall to be in accordance with BNQ 2560–114, «Travaux de génie civil-Granulats », « Partie II : Fondation, sous-fondation, couche de roulement et accotement», after setting up materials. Materials to meet the following requirements before they are used on site:

.1 For non-crushed materials taken from a sandpit, granulometry to meet particle size of the MG 112 according to BNQ 2560-114;

.2 For crushed materials, granulometry must meet particle size of the MG 20 according to BNQ 2560-114;

Internal friction angle to be at least 36° for the portion of soil having less than 2 mm particles, as determined by direct shear testing using procedure described in AASHTO T236, "Direct Shear Test of Soils Under Consolidated Drained Conditions". The test is realized on a sample compacted to 90% corrected maximum dry density and with an optimal water content according to the 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/m³) ». If the portion of soil having less than 2 mm particles is less than 60% the total mass of the tested sample, the soil internal friction angle to be determined using a 300mm × 300mm box shear and removing particles larger than 56 mm. When 60% of the particles of a material are having a diameter over 20 mm, the friction angle is considered suitable and no shear test is required;

.3 Electrochemical criterion to be in accordance with the following table :

Criterion	Requirements		Test Method
	Min.	Max.	
Resistivity (Ω·cm)	3000	–	AASHTO T288
pH	5	10	AASHTO T289
Chlorides (ppm)	–	100	AASHTO T291 method A, art. 13.1 Dosage MA.300[1], MA.303[1]
Sulfates (ppm)	–	200	AASHTO T290 Dosage MA.300[1], MA.303[1]

1. Method of the centre d'expertise en analyse environnementale du Québec.

2.3 OTHER MATERIALS .1 Concrete to be type V, V-P or XIV-C, in accordance with Norme 3101 of the Tome VII from provincial standards « Ouvrages routiers » of the ministère des Transports du Québec.

.2 Color of the overlapping concrete blocks to be beige-limestone gray. These blocks to be in accordance with Norme 3403 of the Tome VII from provincial standards « Ouvrages routiers » of the ministère des Transports du Québec. The color and the texture of the concrete blocks to be submitted for approval to NCC.

.3 As shown on architectural landscaping drawings and on structural drawings (bridges), 2 types of top blocks are required: with backfill on the top of the retaining wall or with a minimum two (2) finished sides. Top blocks to be approved by NCC.

.4 Use A325 Type 1 bolts. Bolts to be galvanized.

.5 Geotextile to be Type IV and in accordance with requirements of the Norme 13101 of the Tome VII from provincial standards « Ouvrages routiers » of the ministère des Transports du Québec and same type as indicated on drawings.

.6 Geogrid to be in accordance with requirements of table 11.10.6.4.2b-1 from standard AASHTO LRFD « Bridge Design Specifications, SI Units, 6th Edition, with 2013 Interim Revisions ».

.7 Type 2 HDPE Perforated drains to be in accordance with standard BNQ 3624-110 and 115.

.8 Sleeves to be made of PVC DR35.

.9 Granular material for setting up retaining wall to be in accordance with requirements shown on drawings and in standard BNQ 2560-114:

.1 Draining Zone: drainage medium, type BC 5-20 in accordance with standard BNQ 2560-114 « Travaux de génie-civil – Granulats », « Partie IV : Béton de masse volumique normale ».

.10 Hot dipped galvanise: apply two zinc layers of at least 600 g/m² where indicated, in accordance to standard CSA G164-M92 (R2003).

2.4 QUALITY INSURANCE - GEOGRIDS

.1 For each geogrid delivery and at least 7 days before being used, Contractor to supply to the NCC Representative a confirmation of compliance with the following information for each production lot:

.1 Manufacturer name and address;

.2 Trade description;

.3 Type of polymer used;

.4 Production Method;

.5 Roll dimensions;

.6 Production lot number. The production lot number to be easily found on delivery slip and on the rolls;

.7 Testing results:

- Tensile Strength;
- Resistance to ultraviolet radiation;

.8 Name of registered laboratory in charge to realize these analyses and tests.

.2 A production lot is composed of one or many geogrid rolls of the same type and the same nature, presenting the same characteristics, manufactured continuously with the same machine and the same lot of raw material. In addition, the maximum surface for a lot is limited to 3000 m².

2.5 BLOCKS

.1 For a receiving inspection of the blocks, 3 blocks are randomly sampled.

2.6 GEOTEXTILE

.1 Geotextiles delivered on site to be produced by a manufacturer where the factory has a certificate of compliance delivered by the BNQ in compliance with the certification protocol BNQ 7009-910 « Géotextiles – Qualité des géotextiles utilisés en génie routier ».

.2 A copy of the certificate of compliance and the appendix presenting the type of geotextile being part of the certification must be supplied for each type of geotextile used.

PART 3 – EXECUTION

3.1 GENERAL

.1 Contractor to execute works with the assistance of a qualified representative of the wall manufacturer. The representative to be on site with the contractor at the beginning for the setting up of the first structural elements of the wall and once required afterwards.

.2 Exact location of the retaining wall to be laid out on site with the NCC Representative.

3.2 GEOMETRY

.1 Unless noted otherwise, wall face to be uniform, without notch, without exterior crown and without irregularity. The horizontal alignment shall not deviate from the theoretical line by more than 15 mm over a length of 3 m; acceptable tilting deviation or acceptable vertical deviation of the wall face is 5 mm for each meter in height.

3.3 FOUNDATION PREPARATION

.1 Bottom of excavations to be densified over a depth of 150 mm at 95% maximum dry density determined 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/m³) ».

3.4 EMBANKMENT AND EXCAVATION

.1 Contractor to backfill up to the top of the wall or up to the foundation of the planned roadway and/or the foundation of the pathway and/or the underside of the rip-rap.

.2 Excavation depth to take into account the thickness of the foundation and/or the lowest row of blocks as well as the minimum buried depth of the wall into the soil.

.3 Granular material of the foundations shall not be used to correct deviation of flatness of the infrastructure.

.4 Bottom of excavations to be parallel to the base of the structure, generally horizontal or in steps, and with the uniform bearing capacity and in accordance with requirements of drawings and specifications. Unstable soils to be stabilised or replaced.

.5 In the case of a structure that is not constructed on piles, on an existing concrete footing or on rock, the excavation of the last 500 mm of soil above the elevation of the bottom of the excavation to be realized with a wide-tipped bucket and just before placing the foundation footing. Bottom of excavations shall not be remoulded. Bottom of excavations to be dry.

.6 When works related to bottom of excavations are completed, Contractor to inform the NCC Representative by transmitting a written notice at least 24 hours before continuing works. NCC Representative will give to the Contractor a written notice to authorize work continuation once defects noted by the NCC Representative have been corrected.

.7 Final grading for the top of walls of Northeast approach and lookout is illustrated on architectural landscaping drawings. Elsewhere, information for rip-rap in front of retaining walls and embankment on top of walls is presented on structural drawings (bridges).

3.5 GRANULAR MATERIAL SET-UP OF THE REINFORCED SOIL

.1 Each bed of inclusions or bed of geogrid is placed on granular material of the embankment once granular material compaction meets requirements.

.2 Contractor to drive piles BEFORE starting to set up retaining walls and their geogrids. Geogrids to pass a round the piles in place and details used will have to be shown on shop drawings.

.3 Unloading granular material on bed of inclusions or bed of geogrids to be done parallel to the wall. Any vehicular traffic (for transportation or compaction) is prohibited directly on inclusions or geogrids.

.4 Grading and compaction to be done by strips parallel to the wall beginning at the center of the embankment towards back, and then going towards the wall.

3.6 CONSTRUCTION OF THE CONCRETE OVERLAPPING BLOCKS

.1 A geotextile to cover the entire surface of the inner face of the wall.

.2 Voids between blocks and geotextiles to be filled with BC 5-20 in accordance with standard BNQ 2560-114, after they have been setting-up.

.3 For the case where the coping block, on top of the wall, to be bonded to the last row of blocks using epoxy adhesive, it to be in accordance with standard ASTM C881/C881M 13 « Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete ».

.4 Contractor will also supply an attestation from his Engineer and/or from the manufacturer confirming that the retaining wall as well as anchors are designed to withstand live loads applied through guardrail on top of the wall. These loads to be in accordance with the standard CAN/CSA-S6, Canadian Highway Bridge Design Code.

3.7 GEOTEXTILE

.1 In order to prevent contamination of the granular materials, Contractor to install a geotextile behind the draining zone as illustrated on drawings. Geotextile to exceed the top part by 300 mm or more. Placing the geotextile to be in compliance with manufacturer's requirements of the retaining wall.

3.8 SLEEVE

.1 Contractor to drill into concrete overlapping block to insert a sleeve through the retaining wall. A sealing compound, an insulation foam and a geotextile are required around the sleeve as per drawings.

3.9 COFFERDAM

.1 Retaining wall set-up to be realized in dry conditions. It is possible that cofferdams are required.

.2 Cofferdam is considered a false work. Contractor to supply false work drawings signed and sealed by two (2) engineers licensed by the Ordre des ingénieurs du Québec. False work drawing to describe the proposed method to allow construction of the permanent structure.

.3 After construction of the cofferdam and after its inspection by an engineer licensed by the Ordre des ingénieurs du Québec, Contractor to supply to NCC Representative a written notice signed by this engineer indicating that the constructed cofferdam is in compliance with submitted drawings. This notice will also indicate time and date of the inspection.

.4 Contractor to dewater the cofferdam.

.5 Once the cofferdam is not required anymore, Contractor to remove it; removal to be realized from downstream towards upstream. Under cold weather, immediately prior to proceed to removal of an earth cofferdam earth (if accepted/acceptable for the project), Contractor to cut up to pieces frozen materials of the cofferdam top part.

3.10 PREFABRICATED BRIDGE INSTALLATION

.1 Contractor to coordinate works with prefabricated bridge installation. Planning to take into account that setting-up retaining walls could be realiszd in more than one phase; for instance, if cranes or other equipment require granular bases lower or higher than the level of the final grade and/or if the granular bases require to exceed the location of the retaining walls with or without temporarily embankment outside of the retaining walls.

3.11 ENVIRONMENTAL PROTECTION

.1 In addition to environmental requirements, the following requirements are applicable for the retaining walls.

.2 In the case where 2 requirements are applicable, the Contractor to consider the most expensive when preparing its submission.

.3 Water coming from dewatering excavations of cofferdams to be evacuated in a sedimentation tank or a natural filter, like a vegetation zone, as per the following requirements :

.1 Sedimentation tank to be designed for an inflow and an outflow;

.2 When the sedimentation tank is filled out to 50%, it to be cleaned;

.3 The natural filter to be located in a grass field (herb), in a peatland or in a forest litter;

.4 Contractor to get the authorisation from the land owner and move regularly the water exit to distribute the sedimentary deposits in order to avoid vegetation reduction;

.5 For zones where there is soil erosion hazard, the soil to be stabilized; if necessary, Contractor to install a pipe, a geotextile or rock ballast;

.6 Temporary sedimentation tank to be teardown at the end of works and the area used to be reconfigured.

.4 NCC Representative could require setting-up sedimentation tanks in order to avoid sediment input towards water body.

.5 Suspended fine material in water course when realizing work in water to be confined using turbidity curtains. Before beginning works, Contractor to install in water course turbidity curtains.

.6 Turbidity curtains to be at a distance exceeding 5 meters downstream of the working zone in water. Filter opening size to be adjusted based on soil type. Turbidity curtains to be installed to allow fish movement. The curtain to be maintained at the bottom of the water course in order to follow irregularities. Height of curtains to be sufficient to allow adjustment due to water level variation. Turbidity curtains to be anchored so that is resists to water movement and/or speed of water. Before removing turbidity curtains, collected sediments to be taken out of water and disposed off-site.

.7 At the first site meeting, Contractor to supply to NCC Representative installation method of turbidity curtains.

.8 Contractor to supply drawings for falsework of sedimentation tank and turbidity curtains. These falsework drawings to be signed and sealed by an engineer licensed by the Ordre des ingénieurs du Québec.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 74 21.

1.2 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 furniture and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit shop drawings indicating dimensions, sizes, assembly, anchorage and installation details for each furnishing specified.

1.3 CLOSEOUT SUBMITTALS

.1 Submit maintenance data for care and cleaning of site furnishings for incorporation into manual specified in Section 01 77 00 - Closeout Submittals.

1.4 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 dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

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

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified inConstruction Waste Management Plan Waste Reduction Workplan] in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

Bench model: client choice. No equivalence.

The only bench model accepted is:

2.1 BENCH

.1 Model: Backless bench, model C-144 classic series by the compagnie Victor Stanley

.2 Specifications:

.1 C-144 components

.2 Length: 6 foot (6’)

.3 Standard metal work color: black

.4 2 X 3 IPE Slats

.5 No stain

.3 Installation:

.1 Installation on concrete slab. (slab covered by asphalt. Refer to plans)

.2 Antitheft anchors required

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for exterior site furnishing installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of NCC representative.

.2 Inform NCC 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 NCC representative.

3.2 INSTALLATION

.1 Assemble furnishings in accordance with manufacturer's written recommendations.

.2 Install furnishing true, plumb, anchored firmly supported, as indicated as directed by NCC representative.

.3 Touch-up damaged finishes to approval of NCC representative.

3.3 CLEANING

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

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

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

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

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

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by site furnishings installation.

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Preparation of sub-grade for placing of topsoil will be measured in square metres of area prepared. This will be measured by NCC representative

1.2 REFERENCES

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

.1 PN1340-2005, Guidelines for Compost Quality.

.3 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.

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

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality control submittals :

.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 - SOURCE QUALITY CONTROL.

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

Part 2 Products

2.1 TOPSOIL

.1 Topsoil for seeded areas and trees specifications:

.1 PH: 6-7

.2 Organic matter: 4-7%

.3 C.E.C.: 10-20 méq / 100g de sol

.4 Electrical conductivity: < 3,5 mmhos / cm
.5 Compaction: 25%
.6 P (Phosphore) Mehlich 3 : > 27 ppm
.7 K (Potassium) Mehlich 3 : > 126 ppm
.8 Mg (Magnesium) Mehlich 3 : > 151 ppm
.9 Ca (Calcium) Mehlich 3 : > 1001 ppm
.10 Sieve size : 20mm
.11 Theoric infiltration level : 0,12 cm / hr
.12 Composition: compost, sand, topsoil, black earth, recycled intrants: 55%

Sieve (mm)	% Passing
10	100
5	98-100
2,5	90-100
1,25	90-97
0,630	80-95
0,315	50-85
0,160	35-65
0,080	15-35

.2 Topsoil for planting beds specifications:

.1 PH: 6-7
.2 Organic matter: 4-7%
.3 C.E.C.: 10-20 méq / 100g de sol
.4 Electrical conductivity: < 3,5 mmhos / cm
.5 Compaction: 30%
.6 P (Phosphore) Mehlich 3 : > 67 ppm
.7 K (Potassium) Mehlich 3 : > 134 ppm
.8 Mg (Magnesium) Mehlich 3 : > 151 ppm
.9 Ca (Calcium) Mehlich 3 : > 1001 ppm
.10 Sieve size : 20mm
.11 Composition: compost, organic fertilizer, sand, topsoil, black earth, recycled intrants: 45%

Sieve (mm)	% Passing
10	100
5	98-100
2,5	90-100
1,25	90-97
0,630	80-95
0,315	50-85
0,160	35-65
0,080	15-35

Part 3 Execution

3.1 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify NCC representative and do not commence work until instructed by NCC representative.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.

.1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.2 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

.1 Place topsoil after NCC representative has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 100 mm.

.3 For sodded areas keep topsoil 15 mm below finished grade.

.4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.3 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by NCC representative.

.1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.4 ACCEPTANCE

.1 NCC representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.5 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site where directed by NCC representative.

3.6 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 74 21.

1.2 MEASUREMENT AND PAYMENT

.1 Measure of hydraulic seeding in square metres

.2 Measure maintenance during establishment period and warranty period of areas seeded in square metres.

.3 Payment for seeding made at unit price bid of actual area surface measurements taken and computed by NCC representative.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

.1 Schedule hydraulic seeding to coincide with preparation of soil surface.

.2 Schedule hydraulic seeding using grass mixtures and mixtures between dates recommended by the manufacturer.

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.

.2 Submit 2 copies of WHMIS MSDS in accordance with 01 35 43 - Environmental Procedures.

.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 Samples:

.1 Submit 0.5 kg container of each type of fertilizer used.

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

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

1.6 QUALITY ASSURANCE

.1 Qualifications:

.1 Landscape Contractor: must demonstrate to the NCC representative.that he have required qualifications for this hydraulic seeding job

.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 Section 01 61 00 - Common Product Requirements 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.

.4 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management.

1.8 WARRANTY

.1 For seeding, 12 months warranty period is extended to 24 month, 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 24 months 1 full growing season.

.3 End-of-warranty inspection will be conducted by NCC 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 Lawn Grass Mixture" in accordance with Government of Canada "Seeds Act" and "Seeds Regulations".
  - .1 Mixture composition: Mountainview Turf, tel :819-777-0112.
    - .1 40% Poa compressa (Canada Bluegrass).
    - .2 35% Poa trivalis (Rough stalked bluegrass).
    - .3 10% Agrotis alba (Red top).
    - .4 7% Medicago lupulina (Black medick).
    - .5 8% Trifolium repens (creeping white clover)

.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%.

.3 Tackifier: water dilutable, liquid dispersion.

.4 Water: free of impurities that would inhibit germination and growth.

.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 NCC representative.
- .2 Inform NCC 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 NCC 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 NCC 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 NCC representative approval of grade and topsoil depth (minimum 150mm) before starting to seed.

3.5 PREPARATION OF SLURRY

.1 Measure quantities of materials by weight or weight-calibrated volume measurement satisfactory to NCC 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.

3.6 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: grass mixture 220 kg.

.2 Mulch: Type I, 1500 kg.

.3 Tackifier: 80 kg.

.4 Water: Minimum 10,000 L.

.5 Fertilizer: 200 kg, ratio 5-10-12.

.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 and 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.

3.7 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 NCC representative.

3.8 PROTECTION

.1 Protect seeded areas from trespass until plants are established.

.2 Remove protection devices as directed by NCC representative.

3.9 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 NCC representative.

.3 Grass Mixture:

.1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

.2 Mow grass to 50 mm whenever it reaches height of 70 mm. Remove clippings which will smother grass as directed by NCC representative.

.3 Fertilize seeded areas after 10 weeks after germination provided plants have mature true leafs and first cutting in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles; water in well.

.4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.

.5 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.

3.10 ACCEPTANCE

.1 Seeded areas will be accepted by NCC representative provided that:

.1 Plants are uniformly established.

.2 Areas must be free of seeding dead spots, ruts and deficient development

.3 Areas have been mown at least twice.

.4 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.

3.11 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 NCC representative.

.2 Mow areas seeded, remove clippings that will smother grassed areas, as directed by NCC representative.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 32 91 19.13.

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 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).

.3 Canadian Nursery Landscape Association (CNLA)

.1 Canadian Standards for Nursery Stock-2006.

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

.1 Material Safety Data Sheets (MSDS).

.5 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 [Departmental Representative] [DCC Representative] [Consultant] of schedule [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.

.3 Samples:

.1 Submit samples of mulch.

.4 Qualifications:

.1 Landscape Contractor: must demonstrate to the NCC representative.that he have required qualifications for this hydraulic seeding job

.2 Landscape Planting Supervisor: Landscape Industry Certified Technician with Softscape Installation designation.

.3 Landscape Maintenance Supervisor: Landscape Industry Certified Technician with Ornamental Maintenance designation.

1.5 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 NCC 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.

1.6 WARRANTY

.1 For plant material over 75 mm caliper plant material as itemized on plant list the 12 months warranty period is extended to 24 months.

.2 Contractor hereby warrants that plant material over 75 mm caliper plant material as itemized on plant list will remain free of defects in accordance with General Conditions CCDC GC 12.3, but for 1 full growing season, one time only providing adequate maintenance has been provided.

.3 End-of-warranty inspection will be conducted by NCC representative.

.4 NCC 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 Zone 5A in accordance with Plant Hardiness Zones in Canada.

.2 Plant material must be planted in zone specified as appropriate for its species.

.3 Plant material in location appropriate for its species.

.2 Plant material: free of disease, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: with straight trunks, well and characteristically branched for species.

.4 Trees larger than 200 mm in caliper: half root pruned during each of two successive growing seasons, the latter at least one growing season before arrival on site.

.5 Bare root stock: nursery grown, in dormant stage, not balled and burlapped or container grown.

.6 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.

2.4 WIRE TIGHTENER

.1 Type 1: galvanized steel, stamped plate type.

.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 2: [38 x 67 x 600] mm.

2.8 GUYING COLLAR

.1 Tube: plastic, 13 mm diameter, nylon reinforced.

2.9 TRUNK PROTECTION

.1 Plastic: perforated spiralled strip.

2.10 MULCH

.1 Natural ceder wood chip: varying in size from 50 mm to 75 mm and 5 to 20 mm thick, free of bark, small branches and leaves. Minimum depth 100mm.

2.11 FERTILIZER

.1 Synthetic commercial type as recommended by 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, colour to be determined.

2.14 SOURCE QUALITY CONTROL

.1 Obtain approval from NCC 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 NCC representative.

.2 Inform NCC 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 NCC representative.

3.2 PRE-PLANTING PREPARATION

.1 Proceed only after receipt of written acceptability of plant material from NCC 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 sediment and erosion control drawings sediment and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.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 Preparation of planting beds in accordance with Section 32 91 19.13 - Topsoil Placement and Grading.

.2 For individual planting holes:

.1 Stake out location and obtain approval from NCC representative prior to excavating.

.2 Excavate to depth and width as indicated.

.3 Remove subsoil, 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 NCC 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 than2 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 to 30 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.

.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 NCC 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 NCC 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 NCC 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 NCC 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 NCC 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 NCC 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 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] [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 NCC representative.

.3 Dispose of unused fertilizer at official hazardous material collection site approved by NCC representative.

.4 Dispose of unused anti-desiccant at official hazardous material collections site approved by NCC representative.

.5 Divert unused wood and mulch materials from landfill to recycling or composting facility approved by NCC representative.

3.11 CLOSEOUT ACTIVITIES

.1 Submit maintenance reports for trees, shrubs, and other plantings.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 REFERENCES

.1 Canadian Nursery Landscape Association (CNLA).

.2 Ontario Ministry of Agriculture, Food and Rural Affairs.

.1 Pruning Ornamentals (#483)-1992.

1.3 SITE VISIT

.1 Contractor shall visit the site work prior to submitting his bid and before starting the work. He shall be aware of existing site conditions, municipal and provincial laws in order to fully understand the scope of work to be completed including other related site constraints.

1.4 QUALIFICATIONS

.1 Staff to possess International Society of Arboriculture and Canadian Nursery Landscape Association certification.

1.5 FIELD SAMPLE

.1 Do sample pruning acceptable to NCC Representative to identify:

.1 Knowledge of target areas including branch bark ridge and branch collars.

.2 Technique for selection process and pruning used to establish desired form and shape for each species.

.2 Acceptance of Work will be determined by NCC Representative from field sample.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Dispose of unused disinfectant at official hazardous material collections site approved by NCC Representative.

.2 Do not dispose of unused disinfectant into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

1.7 MAINTENANCE

.1 Tool maintenance:

.1 Ensure that tools are clean and sharp throughout pruning operation. Do not use tools which crush or tear bark.

.2 Disinfect tools before each tree is pruned.

.3 On diseased plant material disinfect tools before each cut.

2.0 PRODUCTS

2.1 DISINFECTANT

.1 20% solution of sodium hypochlorite or 70% solution of ethyl alcohol.

3.0 EXECUTION

3.1 GENERAL

.1 Prune in accordance with Pruning Ornamentals, and as directed by NCC Representative. Where discrepancies occur between standard and specifications, specifications govern.

.2 Notify immediately NCC Representative conditions detrimental to health of plant material or operations.

.3 Prune during plant dormant period or after leaves have matured. Avoid pruning during leaf formation, at time of leaf fall, or when seasonal temperature drops below minus 10° C.

.4 Prune each species when in full leaf.

.5 Retain natural form and shape of plant species.

.6 Do not:

.1 Flush cut branches.

.2 Crush or tear bark.

.3 Cut behind branch bark ridge.

.4 Damage branch collars.

.5 Damage branches to remain.

3.2 PRUNING

.1 Remove dead, dying, diseased and weak growth from plant material designated by NCC Representative in order to promote healthy growth.

.2 Remove live branches that:

.1 Interfere with healthy development and structural strength including branches crossed or rubbing more important branches.

.2 Are of weak structure including narrow crotches.

.3 Obstruct development of more important branches.

.4 Are broken.

.3 Remove live branches to re-establish natural species form including:

.1 One or more developing leaders.

.2 Multiple growth due to previous topping.

.3 Branches extending outward from natural form.

.4 Undesirable sucker growth.

.4 Remove loose branches, twigs and other debris lodged in tree.

.5 Remove vines.

.6 For branches under 50 mm in diameter:

.1 Locate branch bark ridge and make cuts smooth and flush with outer edge of branch collar to ensure retention of branch collar. Cut target area to bottom of branch collar at angle equal to that formed by line opposite to branch bark ridge.

.2 Make cuts on dead branches smooth and flush with swollen callus collar. Do not injure or remove callus collar.

.3 Do not cut lead branches unless directed by NCC Representative.

.7 For branches greater than 50 mm in diameter:

.1 Make first cut on lower side of branch 300 mm from trunk, one third diameter of branch.

.2 Make second cut on upper side of branch 500 mm from trunk until branch falls off.

.3 Make final cut adjacent to and outside branch collar.

.8 Ensure that trunk bark and branch collar are not damaged or torn during limb removal. Repair areas which are damaged, or remove damaged area back to next branch collar.

.9 Remove additional growth designated by NCC Representative.

3.3 ROOT GIRDLING

.1 For girdling roots one-quarter size of trunk diameter or larger, V-cut girdling root one-half way through at point where root is crossing.

.2 Remove exposed portion of girdling root as directed by NCC Representative after cleanly cutting root flush with grade on each side of parent root. Do not injure bark or parent root.

3.4 CARE OF WOUNDS

.1 Shape bark around wound to oblong configuration ensuring minimal increase in wound size. Retain peninsulas of existing live bark.

3.5 CLEAN-UP

.1 Collect and dispose of applicable pruned material.

END OF SECTION

Part 1 General

1.1 DESCRIPTION

.1 This section specifies requirements for dewatering work spaces described by drawings and specifications. Dewatering systems or cofferdams shall be built to dry up the excavation where new abutments will be built for piles caps (abutments) and retaining walls. Contractor shall use method of its choice, or cofferdams built with sand bags and waterproof membrane, concrete blocks and waterproof membrane or steel sheet piles or other dewatering system equivalent to be approved by NCC Representative.

.2 The work includes but is not limited to:

.1 The design, construction and maintenance of cofferdams considered temporary structures as required to facilitate demolition for existing bridge, construction for the new bridge, setting-up retaining walls and all other work required to realize the project.

.2 Design, provision and maintenance of a dewatering systems for removal of water from the work spaces and to maintain these spaces in the dry state.

.3 Removal of water from the work spaces and the continued maintenance of these spaces in the dry state for the duration of the work to meet work requirements and environmental regulations.

.4 Supply of standby equipment available at any time in order to replace dewatering equipment which malfunctions.

.3 This work is part of NCC General Condition GC3.4.5 stipulating sole responsibility of contractors for temporary structures and other temporary installations. Refer to GC3.4.5.

1.2 RELATED SECTION

.1 Section 01 35 43 — Environmental Protection

.2 Section 35 49 25 — Turbidity Curtains

.3 Section 31 24 13 — Excavation, Embankments and Compaction

.4 Section 02 41 16 — Demolition of Structures

1.3 REGULATORY REQUIREMENTS

.1 Adhere to local, provincial & federal requirements relating to:

.1 Protection of environment
.2 Safety of construction
.3 Protection of workers

.2 Installation of cofferdams must be approved by Department of Fisheries and Oceans in accordance with Fisheries Act.

.3 Pumping water out of cofferdam enclosure: to Section 01 35 43 – Environmental Protection.

.4 Obtain and pay costs of, all required permits at Contractor's costs.

1.4 SUBMITTALS

.1 Shop drawings of water tight cofferdam and other dewatering systems.

.1 Shop drawings shall be signed and sealed by two (2) engineers : a first one licensed by the Ordre des ingénieurs du Québec and a second one licensed by the Ordre des ingénieurs du Québec or by the Professional Engineers Ontario.

.2 Submit design note for the dewatering and cofferdam systems used indicating clearly data and elevations used.

.2 Submit detail drawings to Regulatory Agencies, as required to satisfy conditions for granting of permits.

.3 Submit a certificate of compliance signed by an engineer licensed by the Ordre des ingénieurs du Québec.

1.5 QUALIFICATIONS OF DESIGNER

.1 Designer and verification of cofferdam and other related dewatering structures realised by engineers : a first one licensed by the Ordre des ingéneiurs du Québec and a second one licensed by the Ordre des ingénieurs du Québec or by the Professional Engineers Ontario. Each engineer considerable expertise and experience in design of similar structures and systems.

.2 Designer must: make, check and sign all calculations; check, seal and sign all drawings; inspect dewatering structures and systems on site and verify their adequacy and safety as well as submit a certificate of compliance.

1.6 DESIGN CRITERIA

.1 Design cofferdams to ensure maintenance of work spaces in a dry state for duration of work.

.2 Plan and design dewatering systems considering:

.1 Access to cofferdams and access to reach any portion of Work.
.2 Space required for crews to work in dewatered areas.
.3 Sequence of Work.
.4 Water levels.
.5 Environmental regulations and requirements.

.3 Assurer at all times, maintain environmental quality of water to Section 01 35 43 — Environmental Protection.

.4 Assurer Ensure that no phase of Work threatens safe performance of cofferdam.

.5 The cofferdams are not to obstruct more than two-thirds of the watercourse width when simultaniously present on each side of the watercourse.

.6 Water cumulating in the cofferdams shall be pumped and diverted in a vegetated area located at least 20 meters from watercourse.

1.7 WATER LEVELS

.1 A water level is indicated on the plans. The Contractor must confirm the actual water level on site.

1.8 ENVIRONMENTAL REQUIREMENTS

.1 Dispose of water so that it does not create a safety or health hazard; or cause damage to the environment, to adjacent property or to any portion of Work.

.2 Turbidity limit: to Section 01 35 43 – Environmental Protection and Section 35 49 25 — Turbidity Curtains.

.3 Do not release any silt or other materials into watercourse during construction or removal of cofferdams.

.4 Cofferdam shall be composed of material easily retractable (example : sheet pile, concrete blocks or other types equivalent and approved by NCC), according to environmental requirements and request presented in section 01 35 43 – Environmental Protection.

1.9 PROTECTION

.1 Protect cofferdam and dewatered work spaces from damage due to floods, rain, ice, snow or other adverse climatic conditions.

Part 2 PRODUCTS

2.1 MATERIALS

.1 In good condition, approved by NCC Representative and suitable for their use in Work.

.2 Do not use materials which may cause environmental damage to waterway or to land at or near site.

.3 Materials & methods proposed for use in cofferdams must be approved by Engineer of Contractor and by NCC Representative.

.4 Earth or granular materials with sand and fine material is not acceptable.

.5 If using sandbags, sand must be washed of fine material before placing in water.

.6 Note that Fisheries & Oceans prefers gravel/rock fill with rubber membrane, caissons, rubber dams, sheet piling, bolted pre-engineered frame-type structures, or other types of cofferdams which do not generate turbidity.

.7 Materials used to build earthfill cofferdams shall not have more than 10% of fine material screening through 80 microns sieve, as fine particules stay in suspension in water.

Part 3 EXECUTION

3.1 GENERAL

.1 Evaluate, plan and execute Work in an expert & prudent manner giving due consideration to:

- .1 Climatic conditions which may occur at work location during period of work in its entirety.
- .2 Safety of personnel and of general public.
- .3 Safety of Work and of adjacent property.
- .4 Safety of removals.
- .5 Environmental requirements.
- .6 Clearance requirements for Work.
- .7 Changes in water levels.

3.2 DEWATERING

.1 Dewater work spaces and maintain them in a fully dewatered state until Work is finished.

.2 Continue dewatering operations, to enable Work to proceed in the dry, for duration of Work.

.3 Repeat entire dewatering procedure as often as may be necessary if flooding or other damage occurs before completion of Work.

3.3 EQUIPEMENT

.1 General:

- .1 Provide equipment in safe operating condition & maintain it in a safe operating condition for entire period of use and/or standby for use on Work.
- .2 Provide skilled operators for equipment.

.2 Normes et performance:

- .1 Provide equipment of such quality and in such quantity as to provide sufficient capability to perform essential functions of Work.
- .2 Provide standby replacement for pumps and other essential dewatering equipment which may break down during Work.
- .3 Keep this replacement equipment available on Site for immediate use.

.3 Contractor is responsible to use sufficient pumps in quantity and in diameter to dry the working area in particular, but not limited to, for the retaining walls, piles, and abutments (pile caps). Contractor could not extend contractual delay to do the works due to dewatering or to the cofferdams.

3.4 COFFERDAM REMOVAL

.1 At approved stages in Work remove all cofferdam, temporary structures, and dewatering systems to original bottom level. Removal shall be from downstream towards upstream.

.2 Do not dispose of any materials in canal.

.3 Turbidity curtain is to be removed once cofferdam is removed.

3.5 CLEANING

.1 According to section 01 74 11 - Cleaning.

END OF SECTION

PART I – GENERAL

1.1 SCOPE OF WORK

.1 This Section covers the coordination and the restoration and closure works for the trail S2 of 154 m long and its passing round trail 48m long approximately in natural sensitive environment (marshes and swamps) located southeast of the pedestrian bridge so to re-naturalize the trails as stipulated in the contract. It includes four (4) works for the closure of trails at each one of their extremities (existing dead trees and large stones) – refer to view plan at the end of this Section.

.2 This includes the restoration and closure works for the passing round trail of trail S1 24 m long approximately. It includes two (2) works for the closure of trails at each one of their extremities (existing dead trees and large stones) – refer to view plan at the end of this Section.

.3 It includes also the removal of four (4) dead trees.

.4 Works include the supply of materials, transport of materials to site and to trails, transport of debris off site, the preparation of sites to restore, the installation and levelling of compost layer, plantation with indigenous vegetals of schrub and herbaceous type so to re-naturalize the trail, and the site re-instatement and clean-up of site. Also a follow-up of the evaluation of the stability of sites and ot the recovery of vegetation is included within the warranty period.

.5 The following table shows the dimensions of the trails. Localisation of trails is shown in the map attached at the end of the present Section.

Trail No.	Length (m)	Width (m)	Notes
S1	349	3	Parking-beach – trail to preserve (no works)
S1-A	24	2	Passing round trail to close
S2	154	2	Dump-beach - Trail to close
S2-A	48	1	Passing round trail to close

PART 2 – PRODUCTS

.1 Compost

.1 Compost shall be supplied as per Section 32 91 19.13 – item 2.1.1. The following mix shall be used:

- 40% Poa compressa (Canada Bluegrass)
- 35% Poa trivalis (Rough stalked bluegrass)
- 10% Agrotis alba (Red top)
- 7% Medicago lupulina (Black medick)
- 8% Trifolium repens (creeping white clover)

This mix is available and done at Mountain View Turf (613-777-0112) or equivalent approved by CCN Representative.

.2 Plantation

.1 The plantation with indigenous vegetals of schrub and herbaceous type shall be supplied as per Section 32 93 10.

The species shall be an equal mix of the following :
- Red Maple- *Acer Rubrum* - 200cm ht. (in pot)
- Red Oak – Quercus Rubrum – 200cm ht (in pot)
- Sugar Maple – Acer saccharum – 225cm ht (in pot)
- Silver Maple - Acer saccharinum - 250cm ht. (in pot)
- Bitternut Hickory - Carya cordiformis - 200cm ht. (in pot)
- Northern Hackberry - Celtis occidentalis - 250cm ht. (in pot)
- Bur Oak - Quercus macrocarpa - 200cm ht. (in pot)

Species used for the plantation shall be pure indigenous species (no cultivars or hybrids).

.3 Closure of trails At each of their extremities

.1 Refer to the view plan attached at the end of the present Section.

.2 An example of this type of arrangement shall be fabricated and approved by the NCC Representative before pursuing with the other ones.

PART 3 – EXECUTION

.1 Compost

.1 The compost shall be put in place and levelled as per Section 32 91 19.13.

.2 Plantation

.1 Regroupments of 3 to 5 indigenous trees shall be planted at every 20 to 30 meters in interval along the 3 trails to re-naturalize.

.2 Plantation with indigenous vegetals of schrub and herbaceous type shall be done as per Section 32 93 10.

.3 Closure of trails
At each of their extremities

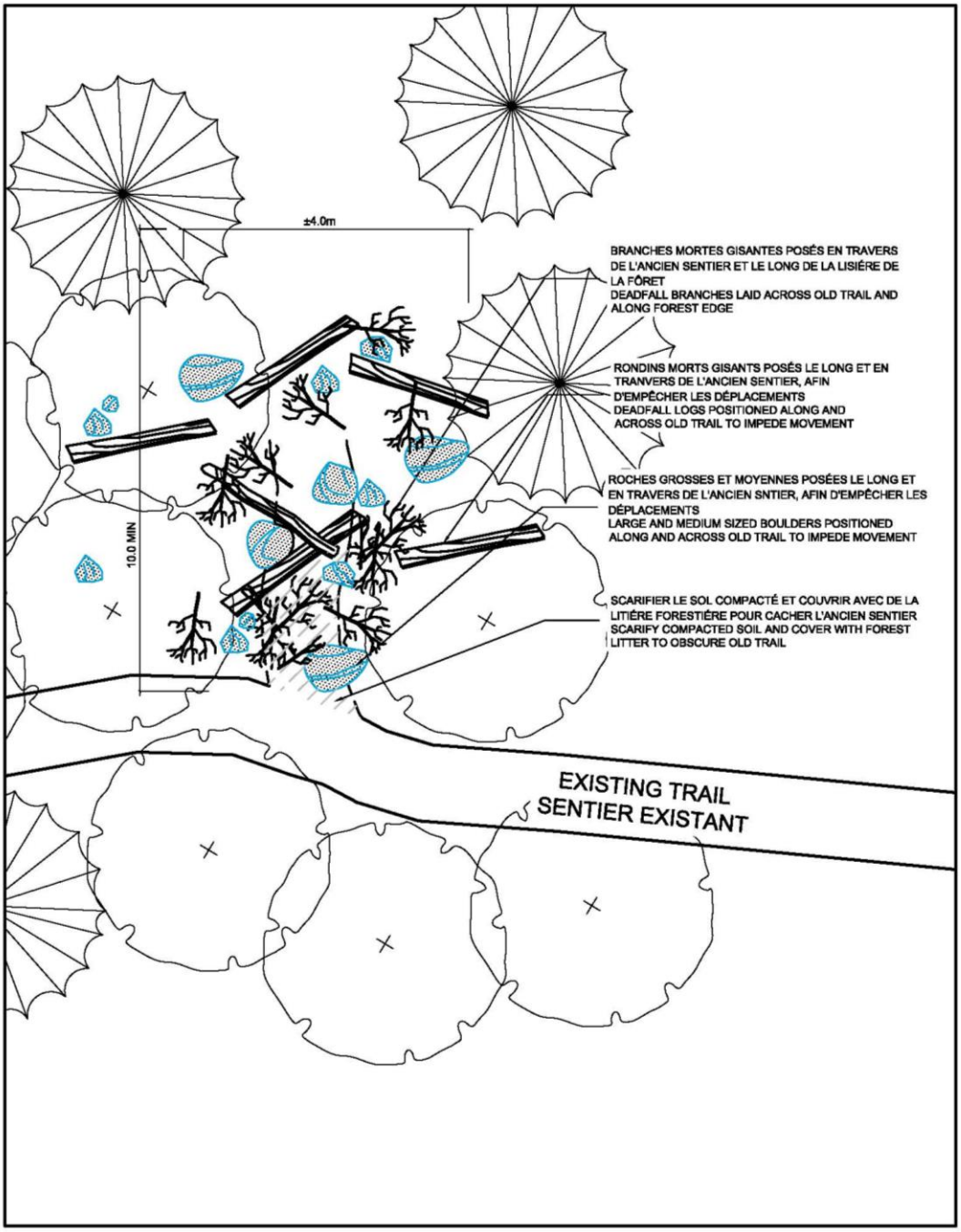
.1 Refer to the view plan attached at the end of the present Section for the description of works.

.2 An example of this type of arrangement shall be fabricated and approved by the NCC Representative before pursuing with the other ones.

FIN DE SECTION


CCN NCC
Canada
Inventaire des sentiers non-officiels dans un secteur de milieux humides situé à proximité du lac Leamy
Localisation des sentiers non-officiels
Zone d'étude
Sentier officiel
Sentier non-officiel
Chemin d'accès
Dépotoir
Point d'intérêt
m 0 50 100 150 200 m
CARTE 2
Octobre 2015
GROUPE DDM
Rivière Gatineau
Sentier de la rivière Gatineau
Promenade du lac Leamy
Sentier des Voyageurs
Boulevard Fournier
Sentier des Voyageurs
Sentier des Voyageurs
Décharge du lac Leamy
Rivière des Outaouais
S1-A
S1
S2-A
S2

English Translation:
Zone d'étude : Study Zone, Sentier officiel : Offical Trail, Sentier non-officiel : Non - Offical Trail, Chemin d'accès : Access Road, Dépotoir : Dump, Point d'intérêt : Point of Interest



Plan view of works for the closure of trails at each of their extremities (six in total)

FIN DE SECTION

1.0 GENERAL

1.1 WASTE MANAGEMENT AND DISPOSAL

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

2.0 PRODUCTS

2.1 MATERIALS

.1 Stone revetments should be hard, dense, durable quarry stone, free from seams, cracks or other structural defects, to meet following size distribution for use intended :

.1 Stones caliber 200-300 mm not less than 50 % of total volume of stones with individual volume of 250 mm or more. Stones caliber 300-500 mm not less than 50 % of total volume of stones with individual volume of 400 mm or more. Refer to detail on drawings.

.2 Remaining percentage of total volume to have uniform distribution of stones between specified caliber.

.2 Underlayer stone, where applicable :

.1 Hard, durable, abrasion-resistant material which will not disintegrate under wave action or wet-dry, freeze-thaw cycles; to NCC Representative's approval.

.2 Angular in shape with ratio of maximum to minimum dimensions not exceeding 3, free of weak cleavage planes, hairline cracks or laminations.

.3 Relative density (formerly specific gravity): to ASTM C 127, not less than 2.65.

.4 Absorption: to ASTM C 127, maximum of 2.0 %.

.5 Los Angeles degradation test: to ASTM C 535, with 45 % maximum loss.

3.0 EXECUTION

3.1 GRADING

.1 Grade shoreline, bank slope to lines and grades indicated.

.2 Excavated material to be used as fill requires approval before placing.

.1 Remove from site, material rejected for fill or surplus to fill requirements.

.3 Place borrow material approved by NCC Representative where required to bring surfaces to required levels.

3.2 GEOTEXTILE FILTER

.1 Place geotextile as indicated, free from wrinkles, with side overlap not less than 600 mm.

3.3 ARMOUR STONE

.1 Place armour stone on completed underlayer stone layers of slope. Placing to be random to thickness as indicated.

.2 Do not end dump stone units. Begin placement at toe of slope and proceed up slope in placing each layer. Place each stone to ensure stability, secure on slope and supported by stone below. Control placement of stone units to produce uniform and continuous cover of overlapping units.

3.4 TEMPORARY PROTECTION

.1 Do not leave each phase of Work exposed for an undue period of time, during revetment construction.

.2 NCC Representative may order excavation to be stopped or may order placing of final protective stone layers to be advanced, depending on anticipated weather conditions.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 43 — Environmental Protection

.2 Section 35 20 22 — Dewatering and Cofferdams

1.2 MESUREMENT AND PAYMENT PROCEDURES

.1 There will be no measurement of Turbidity Curtains.

.2 Payment of Turbidity Curtain shall be included in a Lump Sum Price.

1.3 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM D449l—99a(2004)el, Standard Test Methods for Water Permeability of Geotextiles by Permittivity.

.2 ASTM D4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide—Width Strip Method.

.3 ASTM D4716-04, Standard Test Method for Determining the (In—Plane) Flow Rate Per Unit Width and Hydraulic Transmissivity of a Geosynthetic Using a Constant Head.

.4 ASTM D4751-O4, Standard Test Method for Determining Apparent Opening Size of a Geotextile.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB—4.2, Textile Test Methods.

.2 CAN/CGSB—148.1, Methods of Testing Geosynthetics.

.1 No.2—M85, Mass per Unit Area.

.2 No.3—M85, Thickness of Geotextiles.

.3 No.6.1—93, Bursting Strength of Geotextiles Under No Compressive Load.

.4 No.7.3—92, Grab Tensile Test for Geotextiles.

.3 Canadian Standards Association (CSA)

.1 CAN/CSA—G40.20/G40.21—04, General Requirements for Rolled or Welded Structural Quality Steel.

.2 CAN/CSA—Gl64—M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles. Specification for Temporary Erosion and Sediment Control Measures.

1.4 SUBMITTALS

.1 Submit details of the temporary turbidity curtain system to the NCC Representative prior to the start of the Work.

.2 Submit to the NCC Representative details of geotextile material and seam at least 2 weeks prior to commencing work.

.3 Complete the submission of a Sediment Control Plan as described in the Ontario Ministry of Natural Resources Technical Note, TN-20, Sediment Control Plans: Reducing Sediment concerns at Water Crossings, dated 1992. Ensure compliance of the sediment control plan throughout the project.

1.5 DELIVERY AND STORAGE

.1 During delivery and storage, protect geotextiles from direct sunlight, ultraviolet rays, excessive heat, mud, dirt, dust, debris and rodents.

PART 2 PRODUCTS

2.1 MATERIALS

.1 Geotextile: as indicated in Section - 31 32 19.01.

PART 3 EXECUTION

3.1 GENERAL

.1 Complete the submission of a Sediment Control Plan as described in the Ontario Ministry of Natural Resources Technical Note, TN—20, Sediment Control Plans; Reducing Sediment concerns at Water Crossings, dated 1992. Ensure compliance of the sediment control plan throughout the project.

.2 Supply, install, maintain and remove silt curtains when instructed by NCC Representative.

.3 Monitoring of water turbidity outside the silt curtain will be done by the Consultant as per the Canadian Water Quality Guidelines for the Protection of Aquatic Life — Total Particulate Matter, the maximum increase of total suspended solids above background levels permitted is of 5 mg/L.

3.2 INSTALLATION

.1 Turbidity curtains shall consist of turbidity curtain geosynthetic, load line, flotation, ballast, anchors, mooring buoys, mooring lines, adjustment lines, and tie—downs.

.2 Design to conform to Ontario Provincial Standard Specification, OPSS 577 and Ontario Provincial Standard Drawings: OPSD 219.260 and OPSD 219.261 as a minimum.

.3 Turbidity curtains shall be constructed as follows:

.1 The floatation shall provide support along the length of the turbidity curtain.

.2 A sleeve shall be formed and heat—sealed or sewn along the entire bottom edge of the turbidity curtain geosynthetic, to contain the ballast in the sleeve. Breaks may be made in the sleeve to facilitate pulling, provided they are a minimum 100 mm in size and spaced at minimum 3 m intervals.

.3 Where turbidity curtain geosynthetic is joined to provide a continuous run, the sections shall be connected to provide a continuous seal and prevent the escape of turbid water between the sections.

.4 The turbidity curtain, as prepared for installation, shall be of sufficient width to account for water depth and wave action.

.5 Adjustment lines shall be placed at maximum intervals of lOm, and are to encircle the turbidity curtain from top to bottom.

.6 The turbidity curtain shall be prepared for installation by furling and tying with furling ties every 1.5 m for the entire length of the curtain.

.7 Anchor locations shall be established as is necessary to maintain the turbidity curtain in place and functioning.

3.3 OPERATION AND MAINTENANCE

.1 Turbidity curtains shall be installed to prevent sediment passage, from the area enclosed by the curtain, to the remaining water body. Turbidity curtains shall be installed and maintained in a manner that avoids entry of equipment, other than hand-held equipment or boats, to the remaining water body.

.2 Equipment is permitted in the work area enclosed by the turbidity curtain.

.3 Turbidity curtains shall be operated and maintained in the specified location, with the entire top edge above the water surface.

.4 The curtain shall be free of tears and gaps, and the bottom edge of the curtain is to be continuously in contact with the water course bed so that sediment passage from the area enclosed is prevented.

.5 Any folds in the turbidity curtain which form next to the floatation collar shall be regularly monitored and freed of collected sediment.

.6 Monitor and maintain the turbidity curtains booms both during and outside normal working shifts as required. Provide all personnel, materials and equipment necessary to maintain, repair or relocate the silt curtain system.

.7 Carry out construction operations to minimize impact on fish habitat from both disturbed sediments and fill materials.

.8 Replace damaged or deteriorated geotextile to approval of the NCC Representative.

.9 Remove turbidity curtain when authorized by the NCC Representative after completion of the work.

END OF SECTION