National Capital Commission
Commission de la capitale nationale

Documents du contrat

Contract Documents

RECONSTRUCTION DE PONCEAUX ET CHEMISAGE
PROMENADE DE LA GATINEAU
BOUCLE NORD
PARC DE LA GATINEAU

DC 3080-5

CULVERTS RECONSTRUCTION AND LINING
GATINEAU PARKWAY
NORTH LOOP
GATINEAU PARK

DC 3080-5

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These documents are not to be used for construction purposes (or manufacturing)

GENERAL REQUIREMENTS

SPECIFIC REQUIREMENTS

LIST OF DRAWINGS

National Capital Commission
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Exigences générales

Generals requirements

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1.0 DESCRIPTION OF WORK

.1 The work covered by the present contract mainly include the reconstruction or lining of the existing culverts including site organization, traffic control, tree planting, access road and work platform, environmental procedures and mitigation measures, beaver management, wetland reinstatement, watercourses preservation and road and site reinstatement.

2.0 CODES

.1 Perform work in accordance with contract documents and any other codes of Federal, Provincial or Local applications, provided that in cases 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.

3.0 DOCUMENTS REQUIRED

.1 Maintain at job site, one copy each of the following:

.1 Contract drawings;
.2 Specifications;
.3 Addendum;
.4 Change orders;
.5 Other modifications to contract;
.6 Copy of approved work schedule;
.7 Manufacturers' installation and application instructions;
.8 Copy of approved on-site traffic and equipment operation plan.

4.0 SITE CONDITION

.1 Sub-surface investigation reports include:

.1 Geotechnical Investigation prepared by “Golders Associates”, report number 13-1121-0159 “Geotechnical Investigation, culvert Replacements along Promenade de la Gatineau and Promenade du Lac-Fortune, Gatineau Park, Chelsea, Quebec”, January 2014.

.2 The Geotechnical Report is available for consultation and may be reviewed by the tenderer during the tender period at:

National Capital Commission
7th Floor, 40 Elgin Street
Ottawa (Ontario)
Mathieu Villeneuve (613) 239-5678 ext. 5494

.3 The National Capital Commission (NCC) accepts no responsibility for the accuracy of any borehole information. The information is not to be construed in any way as a guarantee of the underground conditions.

.4 It is the Contractor's responsibility to conduct any other research or geotechnical investigation he may consider necessary for his own comprehension of the project.

5.0 SITE VISIT

.1 Parties intending to submit tenders on the work must visit the site and obtain by themselves all information pertaining to existing conditions affecting the proper execution and completion of the work.

.2 The submission of a tender shall be deemed as proof that the tenderer has complied with this requirement. After, claims for additional compensation will not be entertained for any items of labour or material required to complete the work that could have been reasonably ascertained by a site examination.

6.0 CHANGE OF PRODUCT

.1 When tender documents specify a particular product, replacement products may be submitted to the Engineer no less than seven (7) days prior to the end of the tender period.

.2 When asked to substitute a product or system by another, the Engineer can authorize a replacement solution. In this case, he will send the proper addendum to the known bidders.

7.0 SITE ACCESS

.1 The Contractor is authorized to use NCC's access roads to get to the site. However, the Contractor will be held responsible for all damages caused to these roads and shall repair all such damages at his own expense and to the Engineer's satisfaction.

8.0 CONTRACTOR'S USE OF SITE

.1 Use of site for work execution:
Contractor is authorized by NCC for complete road closure of the Gatineau Parkway-North Loop (north of Chemin du Lac Meech, between P-8 and P-9)

.2 The Contractor has the obligation to take all appropriate protection measures to protect the existing roads towards job site. Any damage resulting from the utilization of these existing infrastructures by the Contractor has to be repaired and restored to its original condition, all at the Contractor's own expense and to the Engineer's satisfaction.

.3 Traffic control

.1 The Contractor is responsible for installing and maintaining all adequate traffic signs, according to site conditions and as per the actual standards and bylaws. Traffic control has to comply with the appropriate sections of "*Tome V - Signalisation routière, de la collection des Normes et ouvrages routiers du Ministère des Transports du Québec (MTQ)*";

.2 For the complete period of work on the North Loop, Contractor shall clearly notify users (car drivers, pedestrian and cyclists) of the road closure period and of alternate roads to reach other open parkways and tourist attractions in the Gatineau Park. The means of notification shall be approved by NCC.

.3 The contractor must delimit the road closure limits (both ends of North Loop) with construction fences complying with the following specifications:

- Galvanized steel fence: Welded metal panel using an interlocking system;
- Height 2,4 m. min.;
- Anchored in loose terrain and asphalt for maximum security and to avoid intrusion;
- Gates for vehicles with chain and padlock.

.4 Storage areas:

.1 All areas used for work storage shall be maintained by the Contractor. Any damages to existing sods, curbs, trees, pavement, etc., due to the Contractor's use of the area shall be repaired and restored to its original condition, all at the Contractor's own expense and to the Engineer's satisfaction.

.2 The existing NCC parking located near culvert 91 can be used for material storage during construction.

9.0 JOB SITE MEETINGS

.1 The Engineer will arrange job site meetings and assume responsibility for setting times and recording and distributing minutes. The Contractor shall be obligated to attend all meetings.

10.0 SCHEDULING OF WORK AND RESTRICTIONS

.1 Work for this contract is to be executed as per the following instructions:

.1 Time frame window (13 weeks):
- Culverts #96: from July 15 to July 15, 2015;
- Culvert #97, 90 & 91: from July 16 to September 15, 2015;
- Culverts lining: from July 16 to September 15, 2015.

.2 Week-end work is permitted.

.2 Under an acceptable format and within 5 working days following the contract's awarding, provide the Engineer with a work schedule indicating dates for:

.1 The presentation of workshop drawings, list of materials and samples;
.2 The beginning and end of work for each task of the construction work;
.3 The work completion date within the specified allowed period described in the contractual documents.

.3 Periodic examinations of the work progress, as per the submitted calendar, will be carried out according to the Engineer's decisions and the Contractor shall update the calendar with the Engineer's assistance and subject to he's approval.

11.0 SITE SETTING OUT

.1 Prior to start of work, NCC will provide a survey of control points and coordinates of works to be layed out.

.2 Contractor shall assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

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

.4 Contractor shall supply such devices as straight edges and templates required to facilitate Engineer's inspection of work.

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

12.0 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 different items of the unit price table.

.2 No separate payment will be made for work performed with respect to any of the special provisions for which there is no specific pay item on the unit price table. The cost of these works must be allocated among, and included in, the different items of the unit price table.

.3 All other items of work required to complete the contract to the extent indicated on the drawings and specifications herein shall be included in the corresponding items of the unit price table.

.4 Measurements for Payment:

.1 Notify Engineer sufficiently in advance of operations to permit required measurements for payment.

13.0 PERMIT AND BY-LAWS

.1 The Contractor shall be fully acquainted with all Federal, 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 The Contractor shall obtain and pay for permits, factory inspectors' approvals, and other licenses required for this project and also pay any other incidental charges for such permits.

14.0 WEIGHTING OF MATERIALS

.1 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 Engineer on site. The Engineer 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.

.2 Weight 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.

15.0 ADDENDUM

.1 Answers to questions directed at the Engineer, and any amendments to the drawings and specifications during the tender period will be communicated in the form of addenda to all Tenderers. Such addenda are to be considered as and read as part of the specifications, and thereby included in the contract documents.

16.0 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.

17.0 RECORD DRAWINGS AND SPECIFICATIONS

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

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

18.0 PROTECTION OF ARCHEOLOGY AND PATRIMONY

.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 Engineer immediately and wait for his written instructions before resuming work.

.3 Any discovery of archaeological nature, old objects or other discoveries of scientific or historical interest are the property of the NCC.

19.0 DAMAGES

.1 Existing plants, landscaped areas, roadways, pathways, structures, traffic signs and public utilities damaged during the execution of the work of this Contract will need to be restored to their original condition, replaced or full compensation made to affected parties by the Contractor.

.2 It is understood that the terms ‘restored or replaced’ include labour, equipment and material costs.

20.0 BILINGUAL DOCUMENTS

.1 This contract’s drawings and specifications are written in both official languages, French and English. Should there be any difference between the two versions, the version that better represents the intention of the project will be used.

21.0 TERMINOLOGY

.1 In this contract, where the term “Engineer” appears, when related to the NCC, it shall be interpreted to mean “NCC representative”.

.2 In this contact, the term “Owner” refers to the NCC.

END OF SECTION

1.0 GENERAL

1.1 SECTION INCLUDES

.1 Contingency allowances.

1.2 REFERENCES

.1 MTQ's «*Cahier des charges et devis généraux – Infrastructures routières et réparation*» (CCDG) 2015 edition, Section 8.4

1.3 CONTINGENCY ALLOWANCES

.1 Predetermined contingency allowances are included in the table of unit price. This amount is the same for all bidders and cannot be changed or removed.

.2 Do not include in Contract Price, additional contingency allowances for products, installation, overhead or profit.

.3 Expenditures under contingency allowance will be authorized in accordance with procedures provided in section 8.4 of the MTQ «*Cahier des charges et devis généraux – Infrastructures routières et réparation*» (CCDG) 2015 edition.

.4 Unexpected work executed in controlled cost mode (time and materials) as well as the use of machines, tools and vehicles are paid following section 8.4.3 of the CCDG and particularly in accordance with the «*Répertoire machinerie et outillage – taux de location indicatif*» valid since April 1st, 2014. The use of heavy machinery is paid following the maximal rate published by the «*Direction générale des acquisitions – Taux de location de machinerie lourde*» valid since April 1st 2014 and in accordance with section 8.4.3.2 of the CCDG.

END OF SECTION

1.0 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

.1 Particular requirements for inspection and testing to be carried out by testing laboratory designated by the Owner are specified under various sections.

1.2 APPOINTMENT AND PAYMENT

.1 Owner will appoint and pay for services of testing laboratory except for the following:
- .1 Inspection and testing required by law, ordinances, rules, regulations or orders of public authorities;
- .2 Inspection and testing performed exclusively for Contractor's convenience;
- .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems;
- .4 Mill tests and certificates of compliance;
- .5 Tests specified to be carried out by the Contractor under the supervision of the engineer.

.2 Where tests or inspections by a designated testing laboratory reveal work not in accordance with contract requirements, the Contractor shall pay the cost for additional tests or inspections as the Engineer may require verifying acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Furnish labor and facilities to:
- .1 Provide access to work to be inspected and tested;
- .2 Facilitated inspections and tests;
- .3 Make good work disturbed by inspection and test.

.2 Notify the Engineer sufficiently in advance of operations to allow for assignment of laboratory personnel and the scheduling of test.

.3 Pay cost for uncovering and making good work that is covered before the required inspection or testing is completed and approved by the Engineer.

.4 Wherever materials are specified to be tested, deliver representative samples in the required quantity to the testing laboratory.

END OF SECTION

1.0 GENERAL

1.1 DEFINITIONS

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

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

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

.4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission. Seven day weeks can be provided for this project as weekend work is permitted.

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

.6 Master Plan: A summary-level schedule that identifies major activities and key milestones.

.7 Milestone: A significant event in Project, usually completion of major deliverable.

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

.9 Project Planning, Monitoring and Control System: Overall system operated by the Contractor to enable monitoring of project work in relation to established milestones.

1.2 REQUIREMENTS

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

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

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

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

1.3 SUBMITTALS

.1 Submit to Engineer within 5 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

.2 Submit Project Schedule to Engineer 5 working days of receipt of acceptance of Master Plan.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

1. Completion of culvert replacements (4)

2. Completion of culvert lining (2)

1.5 MASTER PLAN

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

.2 The Engineer will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

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

1.6 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
- .1 Award;
- .2 Shop Drawings, Samples;
- .3 Permits;
- .4 Mobilization;
- .5 Excavation;
- .6 Culvert replacement and backfill;
- .7 Slope veneer;
- .8 Beaver dam dismantlement, pre-dams and wire mesh;
- .9 Testing and commissioning;
- .10 Top-soil, sodding and seeding works;
- .11 Planting;
- .12 Surfaces reinstatement;
- .13 Lining;
- .14 Traffic control and signage.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule every two weeks during work meetings reflecting activity changes and completions, as well as activities in progress.

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

1.8 PROJECT MEETINGS

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

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

END OF SECTION

1.0 GENERAL

.1 This section specifies general requirements and procedures for contractor submissions of shop drawings, product data, samples and mock-ups to Engineer for review. Additional specifications for submissions are specified in « Specific Requirements » individual sections.

.2 Do not proceed with work until Engineer reviews relevant submissions.

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

.4 Contractor's responsibility for errors and omissions in submission is not relieved by Engineer's review of submissions.

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

.6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Engineer's review of submission, unless Engineer gives written acceptance of specific deviations.

.7 Make any changes in submissions that Engineer may require consistent with Contract Documents and resubmit as directed by Engineer.

.8 Notify Engineer, in writing, when resubmitting, of any revisions other than those requested by Engineer.

1.1 RELATED SECTIONS

.1 Section 01 45 00 - Quality Control.

.2 Section 01 78 00 - Closeout Submittals.

1.2 ADMINISTRATIVE CONSIDERATIONS

.1 Submit to the Engineer submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in work. Failure to submit in ample time is not considered sufficient reason for an extension of contract time and no claim for extension by reason of such default will be allowed.

.2 Work affected by submittal shall not proceed until review is complete.

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

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

.5 Review submittals prior to submission to the Engineer. 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 shall be considered rejected.

.6 Notify Engineer 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 coordinated.

.8 Even if the Engineer reviews the documents and samples, the Contractor's responsibility for submitting complete, exact and conform pieces in accordance to the contract's documents is not relieved.

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

1.3 SAMPLES

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

.2 Deliver samples prepaid to Engineer's office.

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

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

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

.6 Make changes in samples, that the Engineer may require, consistent with contract documents.

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

1.4 SUBMISSION REQUIREMENTS

.1 Coordinate each submission with requirements of work and Contract Documents. Individual submissions will not be reviewed until all related information is available.

.2 Allow 5 working days for Engineer's review of each submission.

.3 Accompany submissions with transmittal letter, in duplicate, shall contain:
- .1 Date;
- .2 Project title and number;
- .3 Contractor's name and address;
- .4 Identification and quantity of each shop drawing, product data and sample;
- .5 Other pertinent data.

.4 Submissions shall 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 Contractors authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents;
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication;
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances;
  - .3 Setting or erection details;
  - .4 Capacities;
  - .5 Performance characteristics;
  - .6 Standards;
  - .7 Operating weight;
  - .8 Wiring diagrams;
  - .9 Single line and schematic diagrams;
  - .10 Relationship to adjacent work.

.5 After Engineer's review, distribute copies.

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

.3 Allow 5 working days for Engineer's review of each submission.

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

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

.6 Accompany submissions with transmittal letter or electronic file, in duplicate, containing:
- .1 Date;
- .2 Project title and number;
- .3 Contractor's name and address;
- .4 Identification and quantity of each shop drawing, product data and sample;
- .5 Other pertinent data.

.7 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 material and details;
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances;
  - .3 Setting or erection details;
  - .4 Characteristics like Power, Flow or Capacities;
  - .5 Performance characteristics;
  - .6 Standards;
  - .7 Operating weight;
  - .8 Wiring diagrams;
  - .9 Single line and schematic diagrams;
  - .10 Relationship to adjacent work.

.8 After Engineer's review, distribute copies.

.9 Submit one printed copy and one electronic copy of shop drawings for each requirement requested in specification Sections and as Engineer may reasonably request.

.10 Submit one electronic or printed copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Engineer where shop drawings will not be prepared due to standardized manufacture of product.

.11 Submit one electronic or printed copy of test reports for requirements requested in specification Sections and as requested by Engineer.
- .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 2 years of date of contract award for project.

.12 Submit one electronic or printed copy of certificates for requirements requested in specification Sections and as requested by Engineer.
- .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.

.13 Submit one electronic or printed copy of manufacturers instructions for requirements requested in specification Sections and as requested by Engineer.
- .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.

.14 Submit one electronic or printed copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Engineer.
- .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.

.15 Submit one electronic or printed copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Engineer.

.16 Delete information not applicable to project.

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

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

.19 Review of shop drawings is for sole purpose of ascertaining conformance with general concept. This review shall not mean that Engineer approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting all requirements of construction and Contract Documents. Without restricting generality of foregoing, Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of all sub-trades.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 – Instructions to Bidders.

1.2 REFERENCES

.1 « Code de la sécurité routière du Québec » (L.R.Q., C.C.-24.2 art. 289).

.2 «*Cahier des charges et devis généraux*, Construction et réparation», CCDG 2015 Edition, from the *« ministère des Transports du Québec ».*

.3 *« Tome V* – Signalisation *routière »,* from the collection of *« Normes – Ouvrages routiers »* from the *« ministère des Transports du Québec ».*

1.3 PROTECTION OF PUBLIC TRAFFIC

.1 During execution of the work or when hauling materials or equipment, Contractor must comply with, over and beyond, requirements of Acts, Regulations and By-Laws in force for traffic or use of roadways.

.2 When work is carried out on roadway in service:

.1 Lay out equipment so as to cause minimum inconvenience and risk to users;
.2 As much as possible regroup equipment, by preference on same side of roadway;
.3 Do not leave equipment on roadway at night.

.3 No lane must be closed without the Engineer's authorization. Before diverting traffic, install appropriate signs, in accordance with reference document's specified instructions.

1.4 INFORMATIONAL AND WARNING DEVICES

.1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.

.2 Supply and erect signs, delineators, barricades and miscellaneous warning devices, as specified in applicable standards.

.3 Place signs and other devices according to applicable standards in recommended locations.

.4 Meet with Engineer prior to commencement of work to prepare a list of signs and other devices required for the project. If on site situation changes, revise list to approval of Engineer.

.5 Continually maintain traffic control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance;
.2 Removing or covering signs which do not apply to conditions existing from day to day.

.6 All information on signs have to be written in French and in English, starting with the French terms.

1.5 CONTROL OF PUBLIC TRAFFIC

.1 In situations listed below, provide competent flag persons, trained and equipped in accordance with standards referenced in item 1.2:

.1 When public traffic is required to pass working vehicles or equipment, which block all, or part of travelled roadway;
.2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use;
.3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning;
.4 Where temporary protection is required while other traffic control devices are being erected or taken down;
.5 For emergency protection when other traffic control devices are not readily available;
.6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

1.6 REQUIRED MITIGATION MEASURES

.1 Develop schematic sketches and traffic management plans and ensure that the Contractor strictly respects them when the work is performed.

.2 Prepare clear signs to be used when work is in progress and ensure that the Contractor properly installs these signs by the roads and that they are strictly enforced by the proper police authorities.

.3 In order to minimise accident risk on nearby roads, no work will be allowed at night.

.4 Take all required protective measures so that work is carried out as safely as possible and so traffic is never interrupted.

.5 Establish clear signs near existing paths and work site limits and ensure continuous access to path users.

END OF SECTION

1.0 GENERAL

1.1 REFERENCE

.1 Government of Canada:

.1 NBC Part 8;
.2 Canada Labour Code, Canada Occupational Safety and Health Regulations.

.2 Province of Quebec:

.1 An Act Respecting Occupational Health and Safety, R.S.Q. 1997;
.2 Safety Code for the Construction Industry 1997.

.3 Canadian Standards Association (CSA):

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

1.2 SUBMITTALS

.1 Health and Safety Plan:

.1 Submit two (2) copies of Contractor's Health and Safety inspection reports at least once every second week;
.2 Engineer's review of Health and Safety Plan or inspection reports does not provide an approval and does not diminish Contractor's responsibility for Health and Safety during work.

.2 Provide immediately upon receipt or completion:

.1 Construction safety checklists;
.2 Reports or instructions issued by Health and Safety inspectors;
.3 Incident and accident reports;
.4 Material Safety Data Sheets (MSDS);
.5 Health and Safety training records including names of personnel and alternates responsible for site health and safety, a list of potential hazards present on site and use of personal protective equipment.

.3 Medical surveillance for site personnel:

.1 Where prescribed by legislation, regulation or safety program, submit Certification of medical surveillance for site personnel within seven (7) days after date of Notice to Proceed and prior to commencement of work;
.2 Update and submit Certification as personnel are sent to site.

.4 On-site Contingency and Emergency Response Plan:

.1 Address standard operating procedures to be implemented during emergency situations.

1.3 GENERAL REQUIREMENTS

.1 In general: see GC 26.

.2 Health and Safety Plan:

.1 Perform site-specific hazard assessment;
.2 Attend health and safety pre-construction meeting;
.3 Develop written site-specific Plan based on hazard assessment prior to commencing any site work;
.4 Include in Plan safety and health risk or hazard analysis for site tasks and operations;
.5 Plan must address project documents;
.6 File required health and safety notices with Provincial authorities prior to commencement of Work;
.7 Continue to implement, maintain, and enforce Plan until final demobilization from site.

.3 Responsibility:

1 Be responsible for health and safety of people that are present on site as well as be responsible of protecting goods on site. Also, within adjacent zones to site, be responsible for health and safety of persons and environment to the extent that they may be affected by project activities;
.2 Comply with and enforce compliance by employees with safety requirements described in Contract Documents, with applicable federal, provincial, and local statutes, regulations and ordinances, and with site-specific Health and Safety Plan.

.4 Compliance requirements:

.1 Applicable legislation, regulations:

.1 NBC Part 8, WHMIS, FC 301, FC 302;
.2 Canada Labour Code, Canada Occupational Safety and Health Regulations;
.3 For work in Québec: Occupational Health and Safety Act, Industrial and Commercial Establishments Regulation, R.R.Q.;
.4 Specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.

.2 Document postings and availability:

.1 Comply with provincial general posting requirements and other safety-related postings as the Engineer may direct;
.2 Maintain one copy of each applicable health and safety standard on job site.

.5 Designated substances, volatile compounds, unforeseen hazards:

.1 Notify Engineer 48 hours in advance of work in occupied areas involving designated substances (under applicable provincial legislation), hazardous substances (Canada Labour Code Part II Section 10), and before works if using volatile compounds;
.2 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of work, immediately stop work and advise Engineer verbally and in writing.

1.4 HEALTH AND SAFETY COORDINATOR

.1 Employ and assign to work a competent and authorized representative as Health and Safety coordinator. The Health and Safety coordinator must:

.1 Have minimum two (2) years site-related working experience specific to activities associated with the work;
.2 Have basic working knowledge of specified occupational safety and health regulations;
.3 Be responsible for completing health and safety training session and ensuring that personnel not successfully completing the required training are not permitted to enter site to perform Work;
.4 Be responsible for implementing, enforcing daily and monitoring site-specific Health and Safety Plan;
.5 Be on site during execution of Work.

1.5 CORRECTION OF NON-COMPLIANCE

.1 Immediately address health and safety non-compliance issues identified by Engineer.

.2 Provide Engineer with written report of action taken to resolve non-compliance of health and safety issues identified.

.3 Engineer may stop work if non-compliance of health and safety regulations is not resolved.

1.6 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.

.2 Assign responsibility and obligation to Health and Safety Coordinator to stop or start work when, at Health and Safety Coordinator’s discretion, it is necessary or advisable for reasons of health or safety. Engineer may also stop work for health and safety issues.

END OF SECTION

This section describes the requirements relative to environmental protection. The Contractor must comply with the requirements in this document. These mitigation measures should be reviewed and understood prior to commencement of any work. This applies to in-kind (size, location) replacements/reconstruction of culverts whereby there is no increase in the footprint beyond the High Water Mark.

Any culvert-specific measures are listed at the end of this document.

Reconstruction of culverts should occur using one of the following methodologies for construction:

1. Create cofferdam (sediment basin) and pipe through on upstream (see appendix A); or

2. Create temporary diversion channel (see appendix B); or

3. Use of double culvert (close one side of the culvert, drain the culvert, conduct the work and reverse).

1.0 GENERAL

- Avoid unnecessary traffic on work site and use the smallest machinery possible.

- Use of treated wood is not permitted.

- Prohibit refuelling and maintenance of machinery within 60 meters of the watercourses and stream banks.

- Some activities shall be limited to specific areas in order to reduce environmental risk and in order to impose adequate protective measures. Identify reserved areas for storing or handling hydrocarbons and hazardous products, as well as cleaning areas and hazardous waste recovery areas and obtain Engineer’s approval.

- Spills must be contained and cleaned up in accordance with all provincial, federal and municipal requirements.

- Comply with all the relevant requirements of applicable laws (e.g., federal and provincial legislation).

- Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks, invasive species and noxious weeds.

- Various concerned Governmental agencies will likely be on site during construction and the Contractor shall provide easy access and meet the requirements of those agencies without delay.

- All construction related activities should be regularly monitored and documented to ensure conformance with applicable regulatory approvals and environmental plans (i.e., sediment and erosion control). In the event of an infraction or incident, applicable agencies (e.g., Environment Canada, Fisheries and Ocean Canada, etc.) will be promptly notified of any environmental issues.

- Ensure mitigation measures are properly implemented, installed, maintained and are functioning effectively during work.

- Concerning the general condition, refuelling and storage of vehicles and machinery, all possible precautions shall be taken in order to minimize the risk of spills, whether accidental or not.

- Erosion control fencing should be placed around all ongoing construction activity areas as well as at adjacent locations where supplies or excavated materials and import fill may be temporarily stored. Fencing should be properly installed and inspected at regular intervals and after significant rain events to confirm it is functioning properly. Areas of exposed soil, especially newly graded areas that cannot be immediately stabilized with final surface treatments should be appropriately treated to minimize erosion (e.g., straw, mulch, erosion blanket, sod or hydro seed).

1.1 RELATED SECTIONS

.1 Section 01 35 30 – Health and Safety Requirements;

.2 Section 35 42 19 – In-water Works.

1.2 FIRES

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

1.3 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.

1.4 DRAINAGE

.1 Ensure required drainage and temporary pumping so the excavations and work site are kept dry.

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

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

1.5 SITE CLEARING AND PLANT PROTECTION

.1 Prevent damage to fencing, trees, landscaping, existing pavement, utility lines, water courses which are to remain:

.1 Repair any damaged items to approval of Engineer;
.2 Replace any trees designated to remain, if damaged, as directed by Engineer;
.3 Cut down trees and control their fall so not to damage existing vegetation or watercourses.

.2 Conduct work to provide minimal disturbance to vegetated buffer zones. Protect trees and plants on site and adjacent properties. Minimize stripping of topsoil and vegetation.

.3 Protect roots of designated trees to drip line during clearing works to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Protect Trees and shrub adjacent to construction work, storage area and trucking lane as specified on drawings and specifications.

.5 No tree or shrub shall be removed without an authorization from the Engineer.

.6 Only those trees identified within the deforestation areas shown on the plans have been authorized to be cut (see detailed list for each culvert under “Specific Mitigation Measures”). Tree removal will occur prior to reconstruction, under a separate contract. If additional trees with a DBH greater than 10 cm need to be cut, an authorization from the Park’s Biologists is required prior to removal. Any trees (DBH > 10cm) should be identified (size and species) as soon as possible by the Contractor to ensure the project is not delayed.

.7 Any trees (DBH > 10 cm) that are removed will have to be replaced, at a 2:1 ratio, with non-invasive species indigenous to the Park, approved by the Park’s Biologists. Every effort should be made to replace species in-kind, with the exception of ash trees (replace with sugar maple or red oak). The Contractor’s tree planting plan must be approved by the NCC prior to the tree planting.

.8 If ash trees are to be cut or pruned, all the wood from the tree (i.e. logs, branches, wood chips) must be left on site in order to prevent the spread of emerald ash borer.

.9 No trees or branches should fall into the watercourse. In the event that this occurs, they should be removed immediately.

.10 Minimize vegetation removal to the extent possible (including wetland/aquatic vegetation). If any tree roots are encountered, procedures should be implemented to minimize potential impact to the tree(s).

.11 The trees to be cut will need to be flagged prior to removal.

.12 All trees within 2 m of equipment in operation and susceptible to being damaged shall have protectors installed around their drip line (e.g. protective fencing)

1.6 MITIGATION MEASURES

.1 Before beginning the work, mark the boundaries of the planned earthworks, identify tree cutting and soil stripping areas.

.2 Mark the site access and the work areas before beginning the work and prohibit the operation of machinery and vehicles outside the marked areas.

.3 Plan for mechanical protective measures (geotextile, stone rip-rap steel plate), in order to reduce bank erosion along the creek, site access and work area during construction and as long as site restoration are completed.

.4 All disturb areas of the work site will be stabilized immediately and re-vegetated as soon as conditions allow.

.5 Direct runoff and drainage water so that it bypasses areas containing soil that is sensitive to erosion. If it's not possible to divert the water, install protective structures (berm, diverting ditch, sediment trap, straw bundle). This installation shall be cleaned when it is over 50% full.

.6 Respect and restore, if necessary, the normal surface runoff, especially near poorly drained areas and depressions.

.7 Use machinery adapted for the soil's bearing capacity.

.8 Do not leave any waste or unused material at the site during or following the work.

.9 Equip trucks with watertight dumps and with tarpaulins to cover their loads.

1.7 SPILLS MANAGEMENT AND REPORTING

.1 Be financially responsible to ameliorate the adverse effects of a spill. The discharger is expected to contain and clean up the spilled contaminant or arrange for the contaminant to be contained and cleaned up. He is also expected to restore the spill site to essentially pre-spill conditions where this can reasonably be expected. To achieve this, the discharger may have to remove the contaminated soil and debris and dispose of these materials in an acceptable manner at an approved disposal site.

.2 The person in charge of a pollutant, at the time of a spill, is considered to have taken a foreseeable risk for which he can prepare himself.

.3 Ensure spills Management Plan (including materials instructions regarding their use, education of contract employees, emergency contact numbers) on-site at all times for implementation in event of accidental spill during construction. Adequate measures to prevent or capture and contain any debris and spills resulting from construction activities should be kept onsite in sufficient quantities. Staff should be oriented as to the location of materials and their proper use and disposal.

.4 An emergency spill kit will be kept on site at all times during construction or when vehicle or equipment are present on site.

.5 Any equipment utilized by the Contractor which develops a fluid leak shall be immediately removed from the site by the Contractor.

.6 Contractor shall carry out operations to stop leakage during a spill and shall immediately contain and recover the product. Immediately notify “NCC Emergency Services” (613-239-5353) and as soon as possible, the Consultant and NCC’s Project Manager. Also contact *“Urgence Environnement Québec”* (1-866-694-5454) if required. Contractor shall contain the product as much as possible in the immediate vicinity of the spill. Following the spill, a specialized firm, chosen by the NCC and paid for by Contractor, will recover as much of the product as possible and clean up the affected area.

.9 Equip trucks with watertight dumps and with tarpaulins to cover their loads.

1.8 WETLAND

.1 Mark with easily observable material the Natural High Water Mark (shown on drawings) of the stream and wetland within the work areas.

.2 Machinery must remain above the High Water Mark and outside of the wetland areas.

.2 Impacts to the wetland areas as a result of construction must be temporary and kept to a minimum. The impacted area must be rehabilitated (including soil, vegetation etc.)

1.9 SEDIMENT AND EROSION CONTROL

.1 Ensure that sediment run-off does not enter the watercourse. Earth berm, silt screens and other works, as required, shall be constructed at appropriate locations to ensure that turbidly is kept to a minimum as determined by Governmental authorities and agencies.

.2 Run-off from construction materials and any stockpiles shall be controlled and discharged in a manner that will prevent sediments from entering watercourses.

.3 Install effective sediment and erosion control measures before starting work to prevent sediment from entering the watercourse. Inspect them regularly during the course of debris removal and make all necessary repairs if any damage occurs.

.4 Maintain existing riparian vegetation in order to help reduce erosion.

.5 Runoff water from outside the work area must be intercepted and re-directed to a settling pond or a vegetation zone more than 30 meters away from streams or wetlands.

.6 A tarp should cover the extra excavation and unconsolidated material stored in the work area at the end of the day.

.7 The principles of good environmental protection must be implemented and maintained in good standing for the duration of the work period.

.8 The water pump must be directed to a settling pond, or towards an area of dense vegetation located more than 30 meters from streams or wetlands. The water should be returned to streams only when there are no suspended solids.

.9 When the water pump is directed to a vegetation zone, a geotextile membrane covered with clean stones must be set up under the end of the hose where the water drains.

.10 The installation of sediment barriers should include the following steps:

.a Dig a trench between 100-150mm deep and 150 wide in the proposed barrier;

.b Push the poles next to the trench (the side of the stream or wetland), with the exception of the last post;

.c Unroll the membrane along the fence line;

.d Expand the base of the membrane in the trench to a width of 150mm;

.e Hang the membrane, making sure the bottom of the membrane is placed well into the trench;

.f Attach the membrane between posts;

.g Attach the last post to the membrane;

.h Cover the bottom of the membrane with compacted soil.

.11 Sediment barriers must be removed and recovered only when reworked surfaces are permanently stabilized, including re-vegetation.

Turbidity Curtain

.1 The Contractor shall install turbidity curtains downstream from the construction areas, below the High Water Mark (High Water Mark to be provided in drawings), to capture suspended fine material.

.2 The components of the turbidity curtain and their installation in the waterbodies must conform to figures in Appendix D. The curtains should have openings of less than 0.060mm filtration. Turbidity curtains should be installed more than 5 meters away from the work zone under the Natural High Water Mark of the creeks and at a height adjusted to that of the current water line present in the creeks.

Sediment Basin

.1 The Contractor will develop, in accordance with Stand Drawing II-9-18 (Appendix C), sediment basins where necessary in addition to those recommended by the Supervisor. These basins should be placed at least 30m away from streams and wetlands.

.2 The capacity of the basins must be adapted to the quantity of water that will be pumped in. However, the minimum capacity of a sediment basin should be 20 cubic meters.

.3 When the sediment basin is 50% full, it must be cleaned. Additionally, a final cleaning must be completed at the temporary closure of the site and the permanent closure of the site. Preventative cleaning will also be undertaken during a weather alert predicting heavy rains.

1.10 MIGRATORY BIRDS AND WILDLIFE

.1 To minimize harm to migratory birds and their nests, trees may not be cut between April 15th and August 15th, which corresponds to the core migratory bird breeding and nesting season.

.2 No vegetation (i.e. trees or low-lying vegetation (i.e. shrubs)) may be removed during the core migratory bird nesting period (April 15 to August 15) unless an active birds nest study is undertaken by a qualified biologist prior to any tree clearing (2 days prior at most). If any active nests are found during this survey, trees cannot be removed until the migratory bird season has concluded or until the nest(s) is no longer active.

.3 In order to minimize the impact on wildlife, all work will be completed within a reasonable time frame.

.4 Workers must keep the work site clean and must not leave behind garbage or food scraps that could attract animals or alter their behaviour.

.5 Workers will avoid wilfully disturbing any wildlife at the site.

.6 Any fauna (mammals, amphibians, reptiles) that are encountered within the work site should not be harmed or harassed. Allow the animal to move away on its own by slowly walking toward it in the direction you want it to move. If it is necessary to move the animal out of the work area, carefully move it into a similar habitat next to the site (within same area).

1.11 NOISE PROTECTION

.1 The noise level emitted by all equipment and machinery must be in compliance with the regulations of the municipality of Chelsea.

.2 Work is permitted Monday through Sunday from 7:00am until 9:00pm. The construction site is closed public holidays (unless special permission is granted by the NCC).

.3 The Contractor must maintain good working equipment and heavy machinery (silencers, regular maintenance, etc.), to keep the noise level as low as possible.

.4 Noise filtering equipment, if available, must be used (for example: close the side panels of compressors, etc.).

.5 The Contractor must shut off any powered equipment when not in use.

1.12 AIR QUALITY

.1 The Contractor must use equipment with functioning exhaust systems.

.2 All machinery must be turned off when not in use.

.3 Soil excavation should be carried out so that it produces the least dust possible.

.4 Construction-related activities that have the potential to release airborne particles should be avoided during periods of prolonged drought and high winds.

.5 The Contractor will take steps to limit the release of dust particles into the air. However, only water is permitted as a stabilizing product within a protected area of 30m measured horizontally from a stream, wetland or source of drinking water.

1.13 SPECIFIC MITIGATION MEASURES

Culvert 90

A diversion dam (pre-dam) will need to be installed at this culvert. Michel Leclair (Beaver Management Contractor for Gatineau Park) will be required to be on site in order to undertake its construction.

It is prohibited to remove or damage a plant species at risk that is protected by provincial or federal legislation without permission from an authorized body. Two Rock Elm (orme liège (Ulmus thomasii)), a species at risk in Québec, are present on site and will need to be removed. A permit was issued by the MDDELCC for their removal. Compensation for the removal of the Rock Elm, in compliance with the MDDELCC permit, will require the planting of 6 Rock Elm saplings and a maintenance/guaranty clause in the contract for a period of 2 year following the planting. Rock Elm saplings must be acquired from an approved source (Pépinière Lafeuillée) – supporting documentation will be provided by Gatineau Park Biologists. Saplings will be planted at a site on Kingsmere road (exact location to be provided by Gatineau Park Biologists) following standard practices (collar, mulch, etc.).

The following trees (DBH > 10 cm) have been approved for removal:

- 23 Spruce/épinettes
- 2 Birch/bouleaux
- 3 Elm/ormes (Including 2 Rock Elm)
- 2 Ash/frêne
- 2 White Pine/ pin blanc

All riparian vegetation surrounding the culvert that is disturbed must be replaced according to NCC standards (including vegetation, soil and water quality). This should include a mix of at least three (3) of the following species:

Upstream (amont)

- Dryoptère intermédiaire/ Evergreen Wood Fern (Dryopteris intermedia)
- Circée du Canada/ Canada Enchanter's Nightshade (Circaea canadensis)
- Érable à sucre/ Sugar Maple (Acer saccharum)
- Chêne rouge/Red Oak (Quercus rubra)
- Cornouiller à feuilles alternes / Alternate-leaved Dogwood (Cornus alternifolia)
- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)

Downstream (aval)

- Maïamthème du Canada/ Wild Lily-of-the-valley (Maianthemum canadense subsp. canadense)
- Aster ponceau/ Purple-stemmed Aster (Symphyotrichum puniceum var. puniceum)
- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)

Culvert 91

An existing beaver dam will need to be removed and a diversion dam (pre-dam) will need to be installed at this culvert. Michel Leclair (Beaver Management Contractor for Gatineau Park) will be required to be on site in order to undertake this work.

The following trees (DBH > 10 cm) have been approved for removal and will require 2:1 compensation:

- 6 Spruce/épinettes
- 3 Elm/ormes
- 1 Birch/bouleau

All riparian vegetation and wetland areas surrounding the culvert that are disturbed must be reinstated to NCC standards (including vegetation, soil and water quality). This should include a mix of at least three (3) of the following species:

Upstream (amont)

- Érable de Pennsylvanie / Striped Maple(Acer pensylvanicum)
- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)

Downstream (aval)

- Érable de Pennsylvanie / Striped Maple(Acer pensylvanicum)
- Vigne des rivages / Riverbank Grape (Vitis riparia)

- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)
- Framboisier sauvage / / North American Red Raspberry (Rubus idaeus subsp. strigosus)

Culvert 96

A diversion dam will need to be installed at this culvert. Michel Leclair (Beaver Management Contractor for Gatineau Park) will be required to be on site in order to undertake its construction.

The following trees (DBH > 10 cm) have been approved for removal and will require 2:1 compensation:

- 2 Birch/bouleaux
- 2 Oak/ chênes
- 2 Maples/érables
- 1 Poplar/peuplier
- 1 Walnut/noyer

This culvert is not considered to have fish habitat.

All riparian vegetation and wetland surfaces surrounding the culvert that are disturbed must be reinstated to NCC standards (this includes vegetation, soil and water quality). This should include a mix of at least three (3) of the following species:

Upstream (amont)

- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)
- Ronce odorante / Purple-flowering raspberry (Rubus odoratus)

Downstream (Aval)

- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)
- Chêne rouge / Red Oak (Quercus rubra)
- Sumac vinaigrier / Staghorn sumac (Rhus typhina)

Culvert 97

A beaver control mechanism is currently in place and will need to be replaced once the work is completed. Michel Leclair (Beaver Management Contractor for Gatineau Park) will be required to be on site in order to undertake this work.

All riparian vegetation and wetland surfaces surrounding the culvert that are disturbed must be reinstated to NCC standards (including vegetation, soil and water patterns). This should include a mix of at least three (3) of the following species:

Upstream (amont)

- Quenouille à feuilles larges / Broad-leaved Cat-tail (Typha latifolia)
- Onoclée sensible/ Sensitive Fern (Onoclea sensibilis)
- Impatiente du Cap/ Spotted Jewelweed (Impatiens capensis)
- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)

Downstream (aval)

- Vigne des rivages / Riverbank Grape (Vitis riparia)
- Vigne vierge à cinq folioles / Virginia Creeper (Parthenocissus quinquefolia)

END OF SECTION

Appendix A: Settling Pond/Sediment Basin

APPENDIX 4 STANDARD DRAWING II-9-18 SHOWING A SETTLING POND

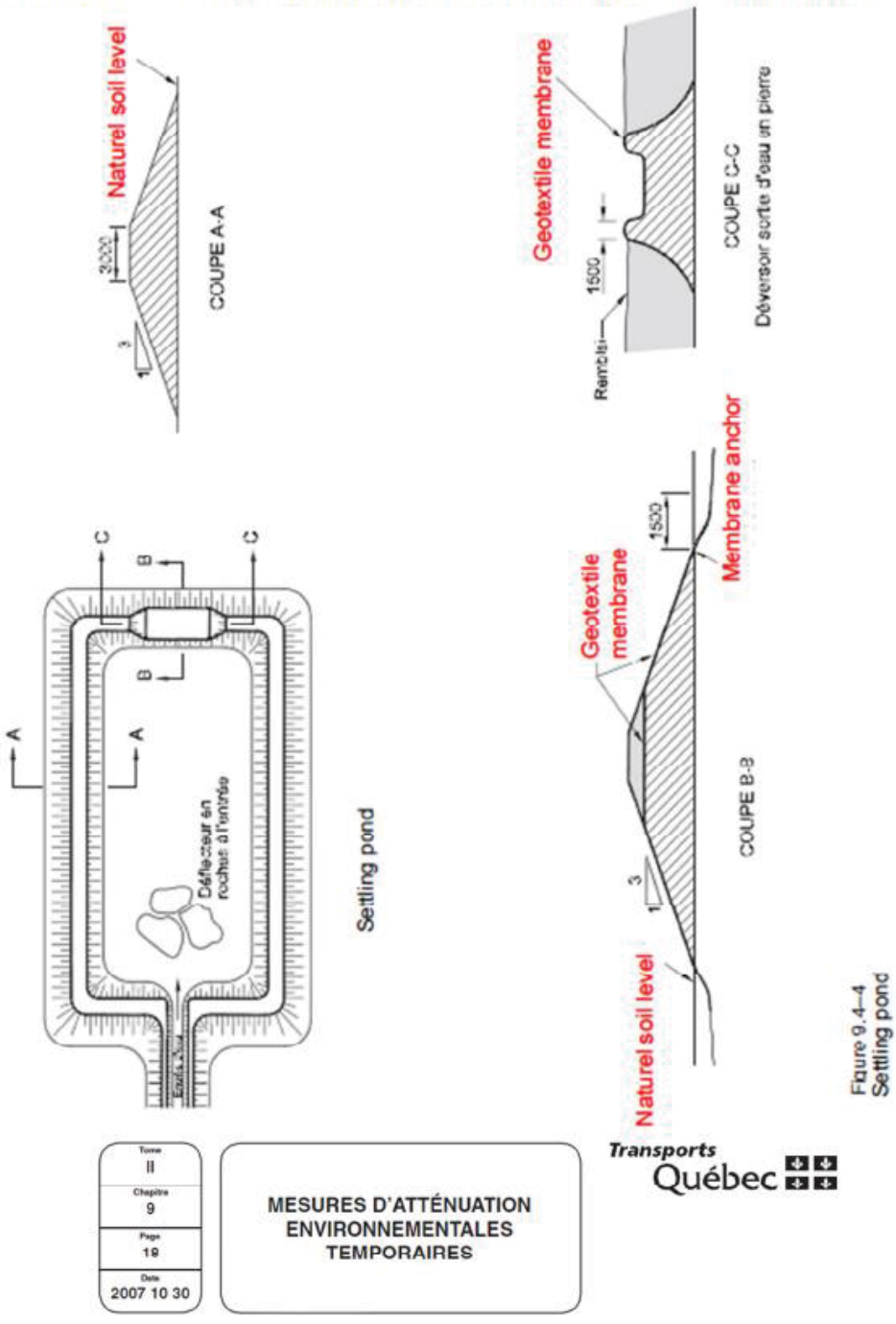
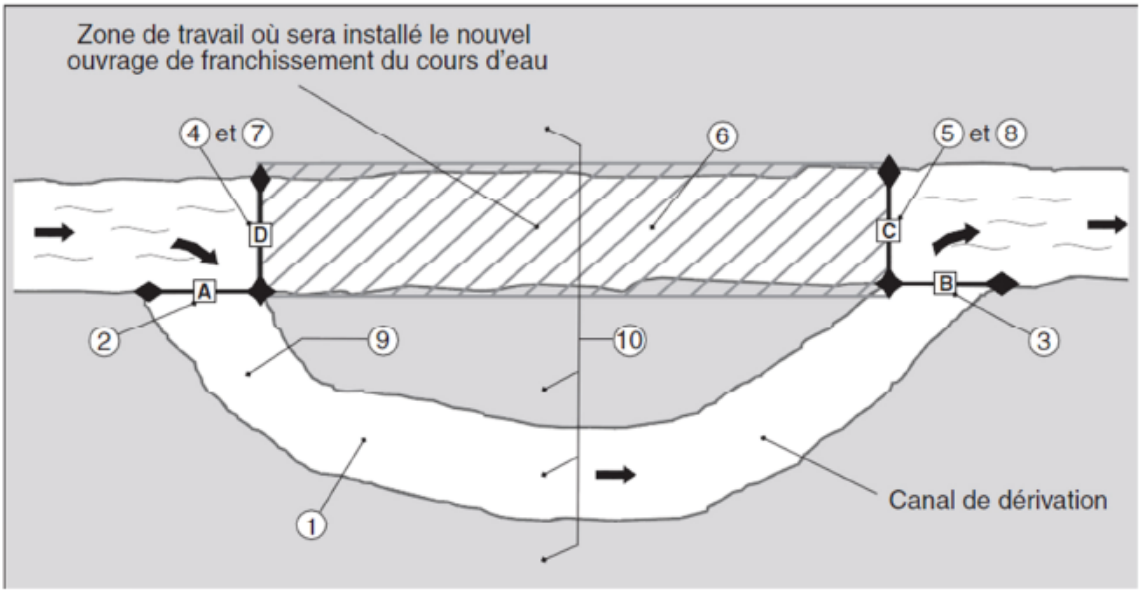


Figure 9.4–4
Settling pond

Appendix B: Diversion Channel Standard Drawing

APPENDIX 5 **STANDARD DRAWING II-9-19 DIAGRAM SHOWING THE STEPS REQUIRED TO DIVERT A STREAM (DIVERSION CHANNEL)**



STEP	EXPLANATION
1	Dig the temporary diversion canal, leaving dams at points "A" and "B" closed, and line the canal with a geotextile membrane (waterproof if the slope is low) or stones, or both;
2	Remove dam "A" gradually at the upstream portion of the diversion stream. Allow time for the disposal of suspended sediment;
3	Remove dam "B" downstream in the diversion canal;
4	Install dam "D" upstream from stream extension;
5	Once the water bed is empty or the construction zone is dry, install dam "C";
6	Install the new dam crossing over the stream and stabilize approaches;
7	Open dam ("D") gradually installed upstream;
8	Remove the dam ("C") downstream of the new opening and gradually close the dam ("A") upstream;
9	Recover the geotextile membrane (or stones) and fill the stream slowly starting upstream;
10	Complete the approach stabilization of the new crossing and restore vegetative cover where necessary.

Appendix C: Silt Fence Standard Drawing

APPENDIX 2 STANDARD DRAWING II-9-14 SHOWING A SILT FENCE WITH A GEOTEXTILE

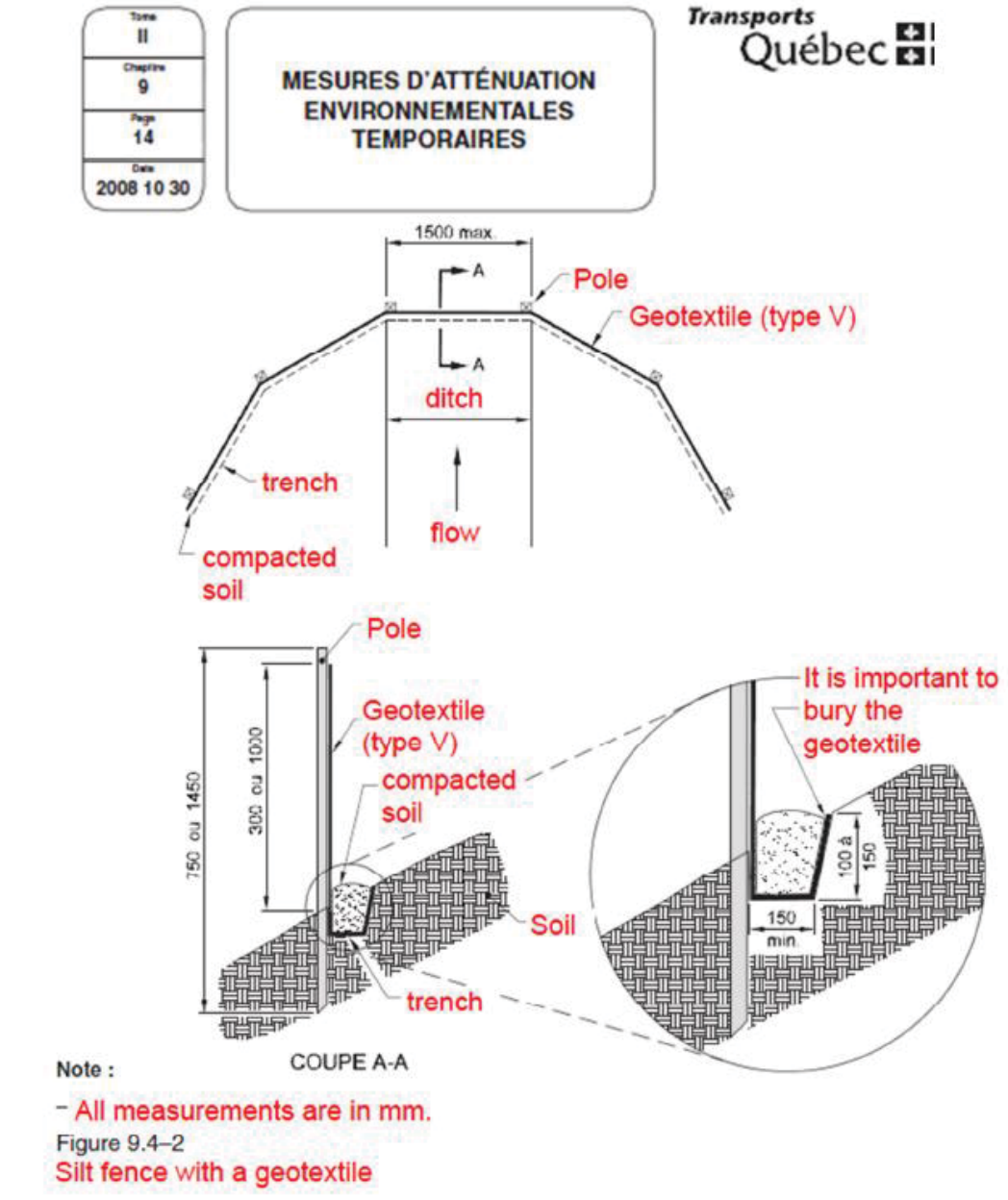
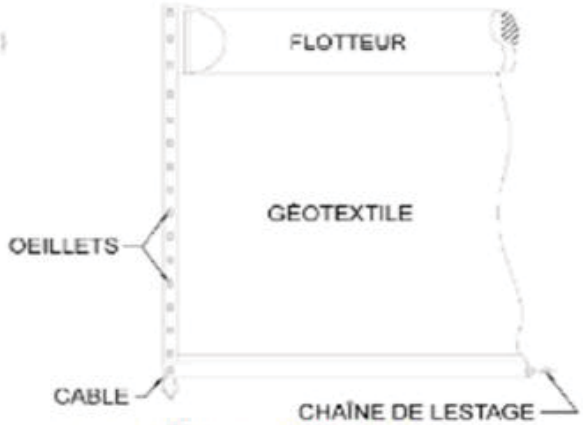


Figure 9.4–2
Silt fence with a geotextile

Appendix D: Turbidity Curtain Standard Drawing

APPENDIX 3 **DIAGRAM SHOWING THE COMPONENTS OF A TURBIDITY CURTAIN AND ITS INSTALLATION WITHIN A STREAM**



Source : Web site of Solmax Texel

FIGURE 1
Turbidity curtain design.

Source : Web site of Solmax Texel

FIGURE 2
An exemple of a turbidity curtain installed in a river.

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

1.2 INSPECTION

.1 Allow Engineer access to Work.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Engineer 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 Engineer may order any 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, Owner shall pay cost of examination and replacement.

1.3 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work.

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

1.4 PROCEDURES

.1 Notify Engineer in advance of requirement for tests, in order that attendance arrangements can be made.

.2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in an orderly sequence so as not to cause delay 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 Engineer as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

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

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

1.6 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as may be requested.

.2 The cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work shall be apprised by Engineer and may be authorized as recoverable.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 – Instructions to Bidders.

.2 Section 01 35 43 – Environmental Procedures

1.2 ACCESS

.1 Provide and maintain adequate access to project site.

.2 When authorized to use existing roads to access the project site, maintain such roads for duration of contract and make good damages resulting from Contractors' use of roads. Clean access roads at the end of each week, or as directed by the Engineer.

.3 Contractor is authorized by NCC for complete closing of Gatineau Parkway – North Loop (north of Chemin du Lac Meech, between P-8 and P-9) in compliance with section 00 21 13.

1.3 ON-SITE OFFICE

.1 The Engineer shall determined the indicated site for his office trailer at the beginning of work. Area used should be surrounded by temporary barricades or fences.

.3 Any other sites, under consideration by the Contractor as storage site, will have to be approved by the Engineer following a written request by the Contractor.

1.4 SANITARY FACILITIES

.1 Contractor shall provide private washroom facilities complete with flush or chemical type toilet, and maintain supply toilet tissue and hand sanitizer product.

.2 Maintain facilities in clean condition at all times.

1.5 REMOVAL OF TEMPORARY FACILITIES

.1 Remove temporary facilities from site at the end of the works or when directed by Engineer.

END OF SECTION

1.0 GENERAL

.1 Use new material unless otherwise specified.

.2 Within 5 working days of written request by Engineer, submit following information for materials proposed for supply:

- .1 Name and address of manufacturer;
- .2 Trade name, model and catalogue number;
- .3 Performance, descriptive and test data;
- .4 Manufacturer's installation or application instructions;
- .5 Evidence of arrangements to procure;
- .6 Use products of one manufacturer for material of same type or classification unless otherwise specified.

1.1 MANUFACTURERS INSTRUCTIONS

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Engineer in writing of any conflict between these specifications and manufacturers instructions. Engineer will designate which document is to be followed.

1.2 DELIVERY AND STORAGE

.1 Deliver, store and maintain packaged material and equipment with manufacturer's seals and labels intact.

.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

.3 Store material and equipment in accordance with suppliers instructions.

1.3 SUBSTITUTION

.1 No substitutions will be permitted without prior written approval of Engineer.

.2 Proposals will be considered by Engineer if:

- .1 Materials selected by tenderer from those specified, are not available;
- .2 Delivery date of materials selected from those materials specified would unduly delay completion of contract;
- .3 Alternative material to those specified, which are brought to the attention of and considered by Engineer as equivalent to the material specified and will result in a credit to the Contract amount.

.3 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.

.4 Amounts of all credits arising from approval of substitutions will be determined by Engineer and Contract Price will be reduced accordingly.

1.4 CONSTRUCTION EQUIPMENT AND PLANT

.1 On request, prove to the satisfaction of Engineer that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.

.2 Maintain construction equipment and plant in good operating order.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 –Instructions to Bidders.

.2 Section 01 78 00 – Closeout Submittals.

1.2 REFERENCES

.1 « Comité Canadien des documents de construction (CCDC) ».
  .1 « CCDC 2 – (2008) Contrat à forfait ».

.2 The project owner's documents indicating existing control survey points and bench marks.

1.3 QUALIFICATIONS OF THE SURVEYOR

.1 Qualified and authorized land-surveyor, with prior experience within the area of the work site and considered acceptable by the Engineer.

1.4 ARCHIVED PLANS

.1 Two copies of the plans will supply by the Engineer, in order to prepare the as-built plans.

.2 Maintain the as-built plans up to date, as well as the modifications of the contractual documents.

.3 Inscribe in red the changes on a copy of the drawings. Before final inspection and when the project is completed, properly transcript all notes on the second copy and submit both copies to the Engineer.

.4 The following information should be recorded:
  .1 Modifications on site of details and dimensions;
  .2 Modifications made by change order or work site directive.

1.5 BENCH MARKS

.1 At the beginning of project, NNC will supply control survey points and coordinates of works to be set-out.

.2 Before construction works determine the control points location and ensure their protection. Preserve permanent benchmarks throughout the duration of works.

.3 Should a bench mark be lost, destroyed or moved due to level or site modifications, inform the Engineer.

.4 Ask the Land-Surveyor to replace the control points in conformity to the original plans.

1.6 LAND SURVEYING RELEVANT REQUIREMENTS

.1 Establish on site two permanent benchmarks for each culvert to be replaced, based on marks previously established in regards to control points' function. Consign their location by inscribing the horizontal and vertical coordinates on the project's file documents.

.2 Establish lines and levels, then determine locations and setting-outs using survey instruments.

.3 Before start of work define the extent and location of the underground utility lines that are within the work area, and inform the Engineer.

1.7 REGISTER

.1 Maintain a precise and detailed register as surveying and verification work progresses.

.2 Confirm locations of all utility lines, should they have been moved, put out of function or remained intact.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 –Instructions to Bidders

.2 Section 01 35 43 – Environmental procedures

.3 Section 02 41 13 – Selective Site Demolition

.4 Section 31 23 17 – Rock Removal Dust Control

1.2 WASTE MANAGEMENT GOALS

.1 Preserve environment and prevent pollution and environmental damage.

1.3 DEFINITIONS

.1 Bituminous pavement: Any combination of asphaltic material and aggregate, excluding asbestos modified asphaltic material.

.2 Concrete: Concrete mixtures produced with Portland cement, which may include blended hydraulic cement, supplementary cement materials, spent debris and silica sand abrasive blasting media from abrasive cleaning of concrete and reinforcing steel, concrete brick, block and associated mortar. Can include embedded steel, and excludes asbestos modified Portland cement concrete mixtures.

.3 Disposable fill: Excess material, other than that disposed of at a certified disposal site, that is managed in berms and mounds, and as fill, other than in road embankments.

.4 Earth: All soils except those defined as rock, and excludes stone masonry, concrete and other manufactured materials.

.5 Excess material: Material removed as a result of Work outlined in the Contract, for which management is not specified. Includes surplus and unsuitable materials.

.6 Fabricated metal and plastic products: Metal and plastic products such as culverts, fence materials, and guide rails. Does not include containers, other packing materials, storage tanks, septic tanks, and ancillary equipment associated with sanitary sewage systems, septic systems, and fuel/lubricant dispensing and storage systems.

.7 Groundwater: Subsurface water and water that occurs beneath the water table in soils and rock formations that are fully saturated.

.8 Natural wood: Stumps, trunks, branches, and debris, from tree and shrub removal, and wood products that are not treated, coated or glued.

.9 Re-use: Utilization, processing, re-processing or recycling of excess material into a construction material or other useful product, and management by these means for the Contract and other work.

.10 Rock: Natural beds or massive fragments, of the hard, stable, cemented part of the earth's crust, igneous, metamorphic, or sedimentary in origin, which may or may not be weathered, and includes boulders having a volume of one (1) cubic meter or greater.

.11 Waste: Excess material managed by re-use or as disposable fill.

.12 Water body: Any body of water or watercourse or wetland, or a portion thereof, and excludes ditches other than those functioning as natural watercourses.

1.4 REFERENCES

.1 Applicable municipal By-laws.

.2 Provisions of the « Règlement sur les déchets solides ».

.3 The « Politique de protection des rives, du littoral et des plaines inondables (décret 123-06 du 24 janvier 1996) ».

1.5 SUBMISSION REQUIREMENTS

.1 Copy of Site Selection Notification form shall be submitted to Engineer when property is to be used for:
  .1 Stockpiling for re-use and for disposable fill;
  .2 Management as disposable fill.

.2 Notification shall be submitted prior to commencement of such work.

.3 Where excess material audit or inventory is imposed by statute, or is condition of the Contract, copy of document shall be provided to Engineer.

2.0 EXECUTION

2.1 CONSTRUCTION

.1 Management of excess material shall be as described below, unless specified otherwise:

  .1 Earth, aggregate, swamp material, rock and natural wood: Manage by re-use or disposal off-site;
  .2 Bituminous pavement, concrete, masonry, fabricated metal and plastic products: Manage by disposal off-site;
  .3 Where excess materials are suspected of being contaminated or if types of materials are encountered which are not addressed in this specification, direction on management shall be obtained from Engineer;

.4 Excess material that is a mixture of materials shall be disposed of according to most stringent conditions associated with any one of individual constituents;

.5 Excess materials shall be managed using methods, which prevent their entry into water bodies and other sensitive areas. These may be identified in Contract. Exceptions may be made when materials are re-used in accordance with requirements specified elsewhere in Contract;

.6 Notification requirements shall be complied with and approvals, releases, and agreements shall be obtained that are necessary for management of excess material;

.7 Stockpiling on the Commission's property and on other property designated in contract shall be as specified, otherwise it shall be outside Commission's property;

.8 Cut wood, stumps and woody debris shall be transported from the work site to an approved site, according to applicable regulations in this manner, unless otherwise specified;

.9 The Contractor should find the site and have it approved by the Engineer and Municipality. The Contractor should get information from the Municipality in regards to existing excess material disposal sites.

END OF SECTION

SITE SELECTION NOTIFICATION FOR MANAGEMENT AS DISPOSABLE FILL

Contract Information

Contract No._____ Owner: _____

The following describes the notification process between the National Capital Commission and the Contractor, wherein the Contractor formally notifies the NCC that agreement has been reached with a third party property owner for the deposition of Contract generated excess material. Such excess material, managed as disposable fill shall be limited to one or a combination of: earth; aggregate; swamp material; rock and natural wood, provided the conditions on management are satisfied.

Site Information

Property Owner(s) for the subject property: _____

Site Location: _____

_____

_____

Quantity and Type of Excess Material used as fill: _____

_____

_____

This is to notify the NCC that permission has been obtained from the property owner(s) named herein for the management of excess materials from this Contract. The property owner has also been provided with a copy of this form and has been advised that a Property Owner<s Release Form will be required. The use of this management site will comply with the following:

Conditions on Management

Bituminous pavement, concrete, masonry, and metal, plastic and polystyrene products will not be accepted for management as disposable fill.

These conditions do not supersede any constraints imposed on this property by Federal, Provincial or Municipal statute or regulations and bylaws made thereto.

Dated this_____day of_____20_____

_____
Print Contractor's Name & Field Representative's Name

_____
Contractor's Field Representative's Signature

_____
Property Owner(s)' Signature(s)

cc: Engineer, Property Owner(s), Contractor

SITE SELECTION NOTIFICATION FOR MATERIALS STOCKPILING

Contract Information

Contract No. _____ Owner: _____

The following describes the notification process between the National Capital Commission and the Contractor, wherein the Contractor formally notifies the NCC that agreement has been reached with a third party property owner for the stockpiling of Contract generated excess material. Such excess material, stockpiled for re-use, may be one or a combination of: earth; aggregate; swamp material; rock; concrete; masonry; bituminous pavement; natural wood; metal, plastic and polystyrene, provided the conditions on management are satisfied.

Site Information

Property Owner(s) for the subject property: _____

Site Location: _____

_____

_____

Quantity and Type of Excess Material stockpiled: _____

_____

_____

This is to notify the NCC that permission has been obtained from the property owner(s) named herein for the management of excess materials from this Contract. The property owner has also been provided with a copy of this form and has been advised that a Property Owner<s Release Form will be required. The use of this management site will comply with the following:

Conditions on Management

It is understood that materials are stockpiled to be re-used.

Stockpiles of bituminous pavement, concrete and masonry may only be located:

.1 a minimum of 30 m from water bodies; and
.2 a minimum of 100 m from residences unless such stockpiles are located within a Provincial or municipal works yard or in a commercially licensed pit or quarry.

These conditions do not supersede any constraints imposed on this property by Federal, Provincial or Municipal statute or regulations and bylaws made thereto.

Dated this_____day of_____20_____

_____
Print Contractor's Name & Field Representative's Name

_____
Contractor's Field Representative's Signature

_____
Property Owner(s)' Signature(s)

cc: Engineer, Property Owner(s), Contractor

PROPERTY OWNER'S RELEASE

Contract No. _____

Work description: _____

_____

_____

Site Location: _____

_____

_____

I/We _____ being the owner(s) of the above Site, verify that the contractor for the above noted work has placed excess material from the above noted Contract on my/our property with my/our permission. I/We have been advised by the Contractor of the conditions of section 01562 of the specification and have been assured by the contractor that these conditions have been met.

Where materials are managed as disposable fill, I/We agree to be responsible for any subsequent relocation and management of the material so placed.

Dated this_____day of_____20_____

_____
Print Contractor's Name & Field Representative's Name

_____
Contractor's Field Representative's Signature

_____
Property Owner(s)' Signature(s)

cc: Engineer, Property Owner(s), Contractor

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 –Instructions to Bidders.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 01 45 00 – Quality Control.

.4 Section 01 52 00 – Construction Facilities.

1.2 AS-BUILTS AND SAMPLES

.1 Maintain at the site for Engineer one record copy of:
- .1 Contract Drawings;
- .2 Specifications;
- .3 Addenda;
- .4 Change Orders and other modifications to the Contract;
- .5 Field test records.

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

.3 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.

.4 Keep record documents available for inspection by Engineer.

1.3 RECORDING ACTUAL SITE CONDITIONS

.1 Record information on set of black line drawings, provided by the Engineer.

.2 Provide red marking pens, for recording information.

.3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.

.4 Contract Drawings: Legibly mark each item to record actual construction, including:
- .1 Measured depths;
- .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements;
- .3 Field changes of dimension and detail;
- .4 Changes made by change orders;
- .5 Details not on original Contract Drawings.

.5 Specifications: Legibly mark each item to record actual construction, including:

.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items;
.2 Changes made by Addenda and change orders.

.6 Other documents: Maintain field test records for every technical section of the specifications.

END OF SECTION

National Capital Commission
Commission de la capitale nationale

Exigences spécifiques

Specific requirements

RECONSTRUCTION DE PONCEAUX ET CHEMISAGE
PROMENADE DE LA GATINEAU
BOUCLE NORD
PARC DE LA GATINEAU

DC 3080-5

CULVERTS
RECONSTRUCTION AND LINING
GATINEAU PARKWAY
NORTH LOOP
GATINEAU PARK

DC 3080-5

1.0 SITE ORGANIZATION

1.1 SITE PREPARATION

.1 This item includes all sections of the General Requirements.

.2 This item is to be paid by lump sum and shall include all Construction Facilities and mitigation measures for Environmental procedures and in-water works (access road and work platform, storage sites, erosion control, construction fence, water pumping and dewatering, cofferdams, etc.) as well as all other expenses related to the site preparation.

.3 Work signage and traffic control are not part of this item.

2.0 CULVERT REPLACEMENT AND RELATED WORKS

2.1 1st CLASS EXCAVATION

.1 This item is paid by the cubic meter of excavated 1st class material and includes the use of excavated 1st class material for the construction of backfills and its disposal when necessary in an approved facility. The 1st class material is measured in its original position by the method of the average of the surfaces or any other suitable method. Measurements and detailed calculations of the payable quantities are determined together with the engineer's representative. At the Engineer's request, the salvaged rocks can be re-used on site for backfilling, stone protection (rip-rap) or other works.

2.2 CULVERT REMOVAL AND RECONSTRUCTION

.1 Contractor shall remove existing culvert and install new culvert according to drawings, specifications and indications in the unit price table, including, but not limiting to, asphalt removal, road structure reconstruction and new asphalt pavement.

.2 Road structure and asphalt reconstruction shall be as indicated on plans.

.3 Saw cuts and milling shall be executed to separate existing asphalt from asphalt needing to be removed.

.4 Precast cutoff walls need to be in conformity with the detail drawings.

.5 Road marking shall be as existing and as specified in section 32 17 23 "Pavement marking".

.6 Transition (frost taper) depth is P 1.8m and the transition slope is 5H:1V.

.7 Unit price for this item measured by the meter of installed culvert and following specifics in the unit price table includes removal of existing asphalt, saw cuts and milling, 2nd class excavation, removal of the existing culvert and disposal, supply of material, labour, required equipment for complete removal and installation of new culvert, cutoff walls, granular materials, geotextile membrane (when required), bedding, coating, back fill, transitions construction, road structure reconstruction, asphalt pavement and marking, off-site hauling of waste material to a site approved by the Engineer as well as all other incidental expenses. Payable length will be equal to length of installed culvert measured on site. Transition excavation and back fill, when required, are also included in the price.

2.3 STONE WALL

.1 Contractor shall construct a stone wall at the culvert end when specified on the drawings. Stone dimension and layout shall be as specified on the drawings. Stone shall be imported from a quarry. A geotextile type IV shall be used between the stone wall and the granular backfill.

.2 Unit price for this item measured by square meter of visible wall and shall include all required earthwork operations, supply and installation of all materials, the geotextile, excess material disposal, bedding, as well as any other inherent expense required for complete work execution.

2.4 SLOPE VENEER

.1 Contractor shall construct a veneer made of crushed rock on the embankments as to stabilize the slope. The granular material shall be 300 mm minus blinded crushed rock for the inner veneer and rip-rap 100-200 mm blinded with top soil for the outer veneer. The slope veneer shall be constructed as specified in the detail drawings.

.2 Unit price for this item is paid by the square meter and includes labour, supply of material and equipment required for the completion of work, the geotextile, and all other incidental expenses. Payable surface will be equal to the finished outer surface of the slope veneer.

2.5 STONE PROTECTION (RIP-RAP)

.1 Stone diameters and thickness of rip-rap as indicated on drawing. Stone imported from a quarry. The imported material shall be similar in quality and texture to salvaged material on site.

.2 Geotextile type V (MTQ) or approved equivalent.

.3 The Contractor shall install protective coating of crushed stone and geotextile at culvert ends and ditches according to drawings or as specified by the Engineer on site.

.4 The unit price for this item is paid by square meter and shall include all required earthwork operations, supply and installation of all materials, excess material disposal, as well as any other inherent expense required for complete work execution.

3.0 BEAVER MANAGEMENT

Beaver management to be undertaken by NCC approved contractor Michel Leclerc:

Michel Leclerc
Eco-Odyssée
52 Chemin les Sources
La Pêche (secteur Wakefield), Québec
J0X 3G0
819-775-0781

3.1 BEAVER DAM DISMANTLING

.1 Where indicated in plans, the Contractor must dismantle beaver dams. The dismantling should be done according to applicable laws and regulations in force. The required permits must be obtained by the contractor before starting the dismantling operations. The dismantling must be carried out according to best practices, so as not to harm or injure beavers, and should allow a gradual drop in water level of the beaver pond. The dismantling method chosen by the contractor shall be submitted to the NCC for approval.

.2 The unit price for this item includes labor, supply of materials as required, permits, all the work required for complete removal of the beaver dam, the environmental protection measures required and any incidental expenses.

3.2 BEAVER PRE-DAM

.1 Where indicated on drawings, Contractor shall construct a beaver pre-dam according to the drawing details. The precise location of the pre-dam is to be coordinated with the NCC prior to commencing work. Stone size to be submitted for NCC's approval and layout as indicated on drawings. Stone imported from a quarry.

.2 The price for this item is paid by the unit and shall include excavation if required, labour, supply of material and equipment required for the completion of work and all other incidental expenses.

3.3 TUBULAR WIRE MESH (BEAVER-STOP)

.1 Where indicated on drawings, Contractor shall remove the existing tubular mesh at the upstream end of the culvert and replace it with a new one (beaver-stop).

.2 The tubular mesh shall be installed according to the supplier's recommendations, complete with wire mesh and anchors and of a length of 5.4m.

.3 Tubular wire mesh specifications from the manufacture shall be provided to the Engineer for approval before installation.

.4 The price for this item is paid by the unit and shall include the removal of the existing tubular mesh, the excavation required, backfill if needed, labour, supply of material and equipment required for the completion of work and all other incidental expenses.

4.0 SITE REINSTATEMENT

4.1 HYDROSEEDING

.1 This item specifies the requirements for the supply and installation of hydraulic seeding approved by the NCC, as well as a comprehensive maintenance program throughout the guaranty period.

.2 Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to complete this work as indicated in the contract documents.

.3 This item will be paid by the square meter of seeded surface.

4.2 SODDING INCLUDING TOPSOIL

.1 This item consists of the supply and installation of anchored sod, approved by the NCC, including 100 mm of topsoil, anchoring pickets and adjustment to required grades, as well as a comprehensive maintenance program throughout the guaranty period. Install sodding on road shoulder

.2 Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to complete this work as indicated in the contract documents.

.3 This item will be paid by the square meter of sodded surface.

4.3 TREE PLANTING

.1 This item consists of the supply and planting of trees, approved by the NCC, including excavation of planting cavity, cultivation and manual excavation to avoid root damage to existing trees, adding topsoil, fertilizers, mulching as required, storage and protection, water, trunk protection and tree supports, etc. as well as providing a comprehensive maintenance program throughout the guaranty period.

.2 Payment at the contract price shall be full compensation for all labour, equipment and materials necessary to complete this work as indicated in the contract documents.

.3 This item will be measured for payment in the number of trees supplied and installed and according to the species specified in the unit price table.

5.0 OTHER WORKS

5.1 EXCAVATION OF POOR QUALITY SOIL UNDER SUB-GRADE (PROVISIONAL)

.1 Contractor shall remove, below level of subgrade, any soil considered of poor quality by the Engineer. This work is to be authorized by Engineer prior to execution.

.2 Unit price for this item measured by cubic meter includes excavation, loading, transport, and disposal of waste materials in an authorised site. Quantities to be paid are measured by the area times the average depth of excavation measured on site.

5.2 CLASS A MATERIAL FOR FILL UNDER SUB-GRADE (PROVISIONAL)

.1 Class A material from source approved by the Engineer.

.2 The Contractor shall install class A fill up to the proposed sub-grade level in order to compensate for non-acceptable earth excavations, only if excavated materials are not accepted by the Engineer and/or they are insufficient in quantity. Compact at 90% of Modified Proctor Testing Method.

.3 Unit price for this item is measured by ton and includes labour, supply, hauling, layout, grading and compaction of fill materials, as well as all other incidental expenses.

5.3 WETLAND REINSTATMENT (PROVISIONAL)

.1 The Contractor must reinstate wetland affected by the work as specified in section 35 42 19 – In-Water Works and other applicable sections. The reinstatement method and the choice of proposed plants must be approved by the NCC before undertaking wetland reinstatement work.

.2 For this item, bidders do not specify a price. A predetermined contingency allowance is already included in the unit price table.

.3 Wetland reinstatement work is provisional. At the request of the NCC, the work shall be undertaken and a price should be agreed upon between the contractor and the NCC before commencing said work.

5.4 CONTINGENCY ALLOWANCE FOR ONFORSEEN SITE CONDITIONS

.1 For this item, bidders do not specify a price. A predetermined contingency allowance is already included in the unit price table.

.2 These contingency allowances will be used by the Engineer, if required, according to Section 01 21 13.

6.0 LINING (PROVISIONAL)

.1 Payment at the contract price shall be full compensation for all labour, equipment and materials necessary for culvert lining (CIPP), management of stormwater and stream water during work, brush clearing as necessary, site reinstatement as well as any other incidental expense.

.2 For this item, bidders do not specify a price. A predetermined contingency allowance is already included in the unit price table.

.3 Lining work is provisional. At the request of the NCC, the work shall be undertaken and a price should be agreed upon between the contractor and the NCC before commencing said work.

7.0 TRAFFIC CONTROL AND SIGNAGE

7.1 TRAFFIC CONTROL AND SIGNS

.1 This item consists of traffic control and signage that apply for the all parts of the project (i.e. culverts replacement and lining).

.2 Payment at the contract price shall be full compensation for all labour, equipment and materials necessary for the entire period where work will take place.

.3 This item will be paid by lump sum.

7.2 CONTINGENCY ALLOWANCE FOR ADDITNIONAL ROAD SIGNS

.1 For this item, bidders do not specify a price. A predetermined contingency allowance is already included in the unit price table.

.2 These contingency allowances will be used for additional signage, if required, by demand of the NCC during construction work, according to section 01 21 13.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 –Instructions to Bidders

.2 Section 01 35 43 – Environmental procedures

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

.4 Section 31 24 13 – Roadway Excavation, Embankments and Compaction

1.2 STORAGE AND PROTECTION

.1 Protect existing items in accordance with section 31 24 13 – Roadway excavation, Embankments and Compaction.

.2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Engineer and at no cost to Owner.

2.0 EXECUTION

2.1 PREPARATION

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

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

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

2.2 COMPLETION OF WORK

.1 Removal: Remove items as indicated.

.1 Do not disturb items designated to remain in place;

.2 Removals of pavements and existing foundations:

.1 Use materials, removal and transport methods so not to disturb sub-adjacent surfaces that are designated to remain by the Engineer;

.2 Plan ways of suppressing dust resulting from removal works.

.3 When removing pipes under existing pavement area excavate at least 150mm below pipe invert.

.2 Disposal of Material

.1 Dispose of materials not designated for salvage or re-use in work, off-site.

.3 Backfill

.1 Backfill in areas as indicated and in accordance with section 31 24 13 – Roadway excavation, Embankments and Compaction.

2.3 RESTORATION

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas.

2.4 CLEANUP

.1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 24 13 - Roadway excavation, Embankment and Compaction;

.2 Section 33 42 13 - Pipe Culverts ;

.3 Section 32 11 19 - Granular Sub-base.

1.2 REFERENCES

.1 «Cahier des charges et devis généraux (CCDG) Construction et réparation», 2015, from the « ministère des Transports du Québec (MTQ)».

.2 «Tome VII – Matériaux», from the collection of «Normes – Ouvrages routiers» from MTQ.

2.0 PRODUCTS

2.1 MATERIALS

.1 In conformity with standard NQ 2560-114 «Travaux de génie civil – Granulats, partie II: Fondation, sous-fondation, couche roulement et accotements».

.2 In conformity with standard NQ 2650-114 «Travaux de génie civil – Granulats, partie III: coussin, enrobement, couche anti-contaminante et couche filtrante».

.3 Coarse and fine aggregate gradations to conform with the following manuals:

.1 «Cahier des charges et devis généraux (CCDG) Construction et réparation», 2015, from the MTQ.

2.2 SOURCE QUALITY CONTROL

.1 Inform Engineer of proposed source of aggregates and provide access for sampling at least 2 weeks prior to starting production.

.2 If, in opinion of Engineer, materials from proposed source do not meet, or cannot reasonably be processed to meet, specified requirements, locate an alternative source or demonstrate that material from source in question can be processed to meet specified requirements.

.3 Advise Engineer 2 weeks in advance of proposed change of material source.

.4 Acceptance of material at source does not preclude future rejection if it fails to conform to requirements specified, lacks uniformity, or if its field performance is found to be unsatisfactory.

3.0 PREPARATION

.1 Processing

.1 Process aggregate uniformly using methods that prevent contamination, segregation and degradation;
.2 Blend aggregates, if required, to obtain gradation requirements, percentage of crushed particles, or particle shapes, as specified. Use methods and equipment approved by Engineer;
.3 Wash aggregates, if required to meet specifications. Use only equipment approved by Engineer;
.4 When operating in stratified deposits use excavation equipment and methods that produce uniform, homogeneous aggregate.

.2 Handling

.1 Handle and transport aggregates to avoid segregation, contamination and degradation.

.3 Stockpiling

.1 Stockpile aggregates on site in locations as indicated unless directed otherwise by Engineer.
.2 Stockpile aggregates in sufficient quantities to meet project schedules;
.3 During winter operations prevent ice and snow from becoming mixed into stockpile or in material being removed from stockpile.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 – Instruction to bidders.

.2 Section 31 23 17 – Rock Removal.

.3 Section 31 24 13 – Roadway Excavation, Embankments and Compaction.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM):
  .1 ASTM D698- 12 Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort (600 kN-m/m 3).

1.3 EXISTING CONDITIONS

.1 Examine subsurface investigation report

.2 Known underground and surface utility lines and buried objects are as indicated on site drawings. Locate existing public utilities before works.

1.4 PROTECTION

.1 Protect existing trees, natural features, benchmarks, and pavements which are to remain as directed by Engineer. If damaged, restore to original or better condition unless directed otherwise.

.2 Maintain access roads to prevent accumulation of construction related debris on roads.

2.0 PRODUCTS

2.1 MATERIAL

.1 Material resulting from excavating or levelling works shall be used as fill, if approved by the Engineer.

3.0 EXECUTION

3.1 GRADING

.1 Grade to levels, profiles, and contours allowing for surface treatment as indicated.

.2 Grade to following depth below finish grades:
  .1 15mm below adjacent top of pavement for grassed shoulder areas.

.3 Grade ditches to depth for maximum run-off as indicated.

.4 Compact filled and disturbed areas to maximum dry density to ASTM D698, as follows:
  .1 90% under road structure areas (under infrastructure line).

3.2 TESTING

.1 Inspection and testing of soil compaction will be carried out by testing laboratory designated by NCC. Costs of tests will be paid by the NCC except tests that are necessary due to the Contractor's fault in meeting the plans and specifications' requirements.

3.3 SURPLUS MATERIAL

.1 Remove surplus material and material unsuitable for fill, grading or landscape works off site.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 00 21 13 – Instructions to Bidders.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 01 35 30 – Health and Safety Requirements.

.4 Section 31 23 13 – Site Grading.

.5 Section 31 24 13 – Roadway embankments.

1.2 REFERENCES

.1 « Cahier des charges et devis généraux (CCDG) Construction et réparation », 2015, from the «ministère des Transports du Québec».

1.3 DEFINITION

.1 Rock excavation: Excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with parent mass, and boulders or rock fragments having individual volume in excess of one cube meter (1m³) and which cannot be removed by means of heavy-duty mechanical excavating equipment. Frozen material is not considered as rock excavation.

2.0 EXECUTION

2.1 ROCK REMOVAL

.1 Remove rock to alignments, profiles, and cross sections as indicated.

.2 Hoe ramming is to be used to remove rock. No explosive blasting is permitted

.3 Use rock removal procedures to produce uniform and stable excavation surfaces, minimize over break and to avoid damage to adjacent structures.

.4 Scale, pressure wash and broom clean rock surfaces, which are to bond to concrete.

.5 Excavate trenches to lines and grades to minimum of 150mm below pipe invert indicated. Provide recesses for bell and spigot pipe to ensure bearing will occur uniformly along barrel of pipe.

.6 Cut trenches to widths as indicated.

.7 Remove boulders and fragments, which may slide or roll into excavated areas.

.8 Correct unauthorized rock removal or over break at no extra cost, in accordance with backfilling requirements specified in Section 31 24 13 – Roadway embankments.

2.2 ROCK DISPOSAL

.1 All materials from 1st class excavations must be used for construction of backfills, road shoulders, rip-rap protection for ditches and ends of culverts, or for any other use according to Engineer's directives.

.2 If materials are lost due to the Contractor's fault, he must replace them at his own cost to the equivalent volume. If some of the materials cannot be reused, the Contractor should dispose of them in an approved site.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures.

.2 Section 35 42 19 – Preservation of watercourses

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

.4 Section 02 41 13 – Selective Site Demolition.

.5 Section 31 05 17 – Aggregates.

.6 Section 31 23 17 – Rock Removal.

.7 Section 32 11 19 – Granular Sub-base.

.8 Section 33 42 13 – Pipe Culverts.

1.2 WASTE MANAGEMENT AND DISPOSAL

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

.2 Divert excess materials from landfill to site approved by the Engineer.

2.0 EXECUTION

2.1 SITE PREPARATION

.1 Cut pavement neatly along limits of excavation in order that surface may break evenly and cleanly.

2.2 STRIPPING OF TOPSOIL

.1 Do top soil and finish grading in accordance with Specific requirements and drawings.

.2 Strip topsoil to depths as required. Do not mix topsoil with subsoil.

.3 Stockpile in locations as directed by the Engineer. Stockpile height not to exceed 2m.

.4 Dispose of unused topsoil off site, on an approved site. Remove clearing and grubbing debris from stripping.

2.3 SETBACKS FOR WORK AROUND TREES

.1 Unless otherwise directed or approved in Specific Requirements or drawings, trenching shall respect the minimum setback distances set out in Table 1.

Table 1: Tree Protection Setbacks

Trunk Dia. (cm) of Existing Tree(s)	Min. Setback (distance from trunk in metres)
Less than 30	2,0
30 to 60	4,5
60 to 100 or more	6,0

.2 In specific instances, where minimum setbacks cannot be met due to site conditions, notify Engineer for approval of revised setback distance.

2.4 DEWATERING

.1 Provide all labour and equipment necessary to pump and dewater excavations.

.2 Protect open excavations against flooding and damage due to surface run-off.

.3 Provide flocculation tanks, settling basins, or other treatment facilities to remove suspended solids or other materials before discharging to watercourses or drainage areas. Contractor shall submit his proposed schedule and staging of construction activities indicating complete details of the proposed sediment control measures to the Engineer for review prior to construction.

2.5 EXCAVATION

.1 Notify the Engineer when waste materials are encountered and remove to depth and limits directed.

.2 Remove obstructions encountered during excavation in accordance with Section 02 41 13 – Selective Site Demolition, including removal of existing asphalt pavement according to limits in drawings.

.3 If excavation along roots are necessary, excavate by hand and cut off roots using a hatchet or a sharpen saw in accordance specific requirements.

.4 Excavate to lines, grades, elevations and dimensions as indicated on drawings.

.5 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.

.6 Notify Engineer when bottom of excavation is reached.

.7 Obtain Engineer approval of completed excavation.

.8 Remove unsuitable material from trench bottom to limit and depth as directed by Engineer.

.9 Correct unauthorized over-excavation as follows:

.1 Fill with approved native material fill compacted to not less than 90% of corrected maximum dry density.

.10 Hand trim, make firm and remove loose material and debris from excavations. Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

.11 Treat ground slopes, where subgrade is on transition from excavation to embankment, at grade points as indicated in drawings.

.12 Dispose of surplus and unsuitable excavated material off site.

.13 Do not obstruct flow of surface drainage or natural watercourses. Maintain profiles, crowns and cross slopes to provide good surface drainage. Provide ditches as work progresses to provide drainage.

2.6 BACKFILLING

.1 Use excavation materials for the construction of embankments, except when specified otherwise by the Engineer. Embankment materials require approval by the Engineer.

.2 Material used for embankment not to contain more than 3% organic matter by mass, frozen lumps, weeds, sod, roots, logs, stumps or other unsuitable material.

.3 When excavation material is not sufficient, use a class B material approved by the Engineer.

.4 Place granular backfill material in uniform layers not exceeding 300mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.

.5 Where material consists of rock:

.1 Place to full width in layers of sufficient depth to contain maximum sized rocks, but in no case is layer thickness to exceed 1m;

.2 Distribute rock material to fill voids with smaller fragments to form compact mass;

.3 Fill surface voids at subgrade level with rock spalls or selected material to form earth-tight surface;

.4 Do not place boulders and rock fragments with dimensions exceeding 150 mm within 300mm of pavement subgrade elevation;

.5 Place fill material around works as indicated.

2.7 COMPACTING

.1 General

.1 Compact material to density of 90% corrected maximum dry density, except for the 150 mm under the infrastructure line that must have a density not less than 95%;

.2 Apply water as necessary during compacting to obtain specified density;

.3 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved by Engineer;

.4 Correct surface irregularities by loosening and adding or removing material until surface is within specified tolerance.

2.8 FINISHING

.1 Finish slopes, ditch bottoms and borrow pits true to lines, grades and drawings.

.2 Hand finish slopes that cannot be finished satisfactorily by mechanical equipment.

2.9 RESTORATION

.1 Upon completion of work remove waste materials and debris; trim slopes, and correct defects as directed by Engineer.

.2 Replace topsoil as directed by Engineer.

.3 Alleviate compaction of adjacent turf caused by contractor’s equipment by turf aeration.

.4 Clean and reinstate areas affected by Work as directed by the Engineer.

2.10 PROTECTION

.1 Maintain finished surfaces in good condition and conforming to this section until acceptance by the Engineer.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 17 – Aggregates.

.2 Section 31 24 13 – Roadway Excavation, Embankments and Compaction.

.3 Section 31 23 17 – Rock Removal.

2.0 MATERIALS

.1 Granular base material in accordance with Section 31 05 17 – Aggregates.

.2 Sub-base: MG-56, 300mm, 95% compaction.

.3 Base: MG-20, 150mm, 98% compaction.

3.0 EXECUTION

3.1 SEQUENCE OF OPERATION

.1 Place granular sub-base after subgrade surface is graded, inspected and approved by Engineer.

.2 Place granular base after sub-base surface is graded, proof rolled, inspected and approved by Engineer.

.3 Placing

.1 Complete, in indicated locations sub-base and base in respect to profiles across and in length as shown on drawings and according to the Engineer's directives;
.2 Thickness of sub-base and base must be in conformity to drawings and specification's requirements;
.3 Spread aggregates in uniform layers not exceeding 300mm;
.4 Required compaction degree for sub-base material is 95.0% of dry maximal density (CAN/BNQ 2501-255 « Sols – Détermination de la relation teneur en eau – masse volumique – Essai avec énergie de compactage modifiée (2 700 κN·m/m^3) » ;
.5 Required compaction degree for final base material is 98,0 % of dry maximal density (CAN/BNQ 2501-255 « Sols – Détermination de la relation teneur en eau – masse volumique – Essai avec énergie de compactage modifiée (2 700 κN·m/m^3) »;
.6 Before installing foundations, surface of sub-base must be free of rut and other depressions, and any variation of more than 20 mm of the required level must be corrected;

.7 Ensure no frozen material is placed;
.8 Place material only on clean unfrozen surface, free from snow and ice;
.9 Remove and replace that portion of layer in which material becomes segregated during spreading.

.4 Compaction Equipment
.1 Compaction equipment to be capable of obtaining required material densities.

3.2 SITE TOLERANCES

.1 Finished base surface to be within plus or minus 10 mm of established grade and cross section.

3.3 PROTECTION

.1 Materials coming from rock quarries or sand pits must be transported so as to avoid formation of rut and depression on the infrastructures and various layers composing the roadway's foundations. Depressions and ruts higher than acceptable on the infrastructure and any other layer must be corrected, at the Contractor's expense, before installing the subsequent layer.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 17 – Aggregates;

.2 Section 32 11 19 – Granular Sub-base.

1.2 FORMULA

.1 At least 5 days prior to the application of the asphalt, the Contractor shall provide the Engineer with the theoretical and final formulas for the hot asphalt. Contractor shall also provide the Engineer with all test results and methods of calculations to show that theoretical and final formulas where determined following the required evaluation methods as well as the traceability of samples and of tests undertaken.

2.0 PRODUCTS

2.1 MATERIALS

.1 Bitumen, bituminous binder, aggregate and asphalt mix to conform to the following manual:
  .1 « Cahier des charges et devis généraux (CCDG)-Construction et réparation », 2015 edition, from the « ministère des Transports du Québec »;
  .2 « Tome VII – Matériaux », from the collection of « Normes – Ouvrages routiers » from the « ministère des Transports du Québec ».

.2 Bitumen performing class for asphalt preparation according to geotechnical report.

.3 Prepare and lay asphalt according to MTQ Standard 4202.

3.0 EXECUTION

3.1 PAVEMENT THICKNESS

.1 Pavements for roadways:
  .1 Surface course: 40 mm ESG-10, performance grade PG-58-34.
  .2 Base course: 60 mm ESG-14, performance grade PG-58-34

3.2 PAVEMENT CONSTRUCTION

.1 Materials for asphalt reconstruction shall conform to article 13.3.3 of the CCDG.

.2 Construction of asphalt, including surface preparation conform to article 13.3.4 of the CCDG.

.3 Asphalt to be compacted to a minimum of 93 % of the maximum density.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB):
  .1 BNQ 2410-100 « Calcium chloride ».

1.2 MEASUREMENT FOR PAYMENT

.1 Cost of supply and application of calcium chloride shall be distributed among the different items of the unit price table.

1.3 DELIVERY STORAGE AND HANDLING

.1 Supply calcium chloride in quantities and at times as directed by Engineer.

.2 Deliver calcium chloride to site in moisture-proof bags, or in bulk in tank cars. Indicate name of manufacturer, name of product, net weight or mass, and percentage of calcium chloride guaranteed by manufacturer.

.3 Store bags of calcium chloride in weatherproof enclosures.

.4 Supply calcium chloride as 35% aqueous solution.

2.0 PRODUCTS

2.1 MATERIALS

.1 Calcium chloride, Type I: to BNQ-2410-100, flake or 35% aqueous solution.

3.0 EXECUTION

3.1 APPLICATION

.1 When vehicles travel on granular surfaces and that climatic conditions cause excess dust that is harmful to the environment and traffic, surfaces can be treated with dust control, in the form of solid or liquid calcium chloride in sufficient quantity and to the Engineer’s satisfaction.

.2 Apply aqueous calcium chloride with distributors equipped with spray system to ensure uniform application and with means of shut-off.

.3 Dust control should not be applied when roads are wet due to previous rainfalls, during rainfalls or when rainfalls are predicted for that day.

END OF SECTION

1.0 GENERAL

1.1 REFERENCES

.1 The roadway's marking must be carried out according to the standard's specified requirement from the « ministère des Transports du Québec » on signalisation and in respect to details mentioned within the plans and specifications.

.2 Traffic Signage: not required.

1.2 SAMPLES

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

.2 Submit to Engineer the following material sample quantities at least 2 weeks prior to commencing work.
- .1 Two 1 L samples of each type of paint;
- .2 One 1 kg sample of glass beads;

.3 Mark samples with name of project and its location, paint manufacturer's name and address, name of paint, CGSB specification number and formulation number and batch number.

2.0 PRODUCTS

2.1 MATERIALS

.1 Pavement markings:
- .1 Alkyde Paint
  - .1 Paint – Standard 10201 from the « ministère des Transports du Québec ».
  - .2 Paint should be of yellow color approved by the NCC
- .2 Glass beads
  - .1 Standard 14601 from the « ministère des Transports du Québec ».

3.0 EXECUTION

3.1 EQUIPMENT REQUIREMENTS

.1 Paint applicator to be of an approved pressure type distributor capable of applying paint in single, double and dashed lines. Applicator to be capable of applying marking components uniformly, at rates specified, and to dimensions as indicated, and to have positive shut-off.

.2 Distributor to be capable of applying reflective glass beads as an overlay on freshly applied paint.

3.2 CONDITION OF SURFACES

.1 Pavement surface to be dry, free from pounded water, frost, ice, dust, oil, grease and other foreign materials.

3.3 TRAFFIC CONTROL

.1 Contractor is responsible for traffic control to place pavement markings.

3.4 APPLICATION

.1 Pavement markings to be laid out by Contractor.

.2 Unless otherwise approved by Engineer, apply paint only when air temperature is above 10°C, wind speed is less than 60 km/h and no rain is forecast within next 4 h.

.3 Apply traffic paint evenly at rate of 48 l/km on max. 120mm wide.

.4 Do not thin paint unless approved by Engineer.

.5 Paint lines to be of uniform colour and density with sharp edges.

.6 Thoroughly clean distributor tank before refilling with paint of different colour.

.7 Apply glass beads at rate of 0.6 kg/L of painted area immediately after application of paint.

3.5 TOLERANCE

.1 Paint markings to be within more or less 12 mm of the existing dimension.

3.6 PROTECTION OF COMPLETED WORK

.1 Protect pavement markings until dry.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 43 – Environmental Procedures

.2 Section 05 35 35 - Preservation of Watercourses

.3 Section 32 92 20 – Seeding

.4 Section 32 92 23 – Sodding

.5 Section 32 93 10 – Planting

1.2 EXTEND OF WORK

.1 Sub-grade preparation for topsoil.

.2 Supply and installation of topsoil.

.3 Planting bed preparation.

2.0 PRODUCTS

2.1 TOPSOIL

.1 Materials In accordance with section 19.3.1.1 of CCDG.

2.2 QUALITY CONTROL AT SOURCE

.1 Only the source and mixtures stipulated will be accepted for the topsoil.

.2 Submit the technical charts of the products, and the packing slip for each load of soil.

3.0 EXECUTION

3.1 PREPARATION OF EXISTING GROUNDS

.1 Verify that grades are correct. If discrepancies occur, notify Engineer, and do not begin work until instructed by the Engineer.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50mm diameter, and other deleterious materials. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which protrudes more than 75mm above surface. Dispose of removed material off site.

3.2 PLACING AND SPREADING OF TOPSOIL AND PLANTING SOIL

.1 Spread topsoil once the Engineer has accepted sub-grade.

.2 Spread approved and unfrozen topsoil in uniform layers not exceeding 100mm that contain sufficient water.

.3 To turf an area, bring topsoil layer level to 15mm below the final ground level.

.4 Spread topsoil as follows, to this minimum depth once settled:

.1 100mm for turf or sod areas;

.5 Manually spread topsoil, around trees, shrubs and where existing obstacles prevent the use of mechanical equipment.

.6 Provide for approximately 25% settling when placing topsoil, in order to respect the projected grades.

.7 Place topsoil in the rip-rap of the outer slope veneer to fill voids, as specified in the drawings.

3.3 PRECAUTIONS

.1 Hand excavate and till in order to protect existing tree roots. Do not prune roots to facilitate planting, rather adjust planting pattern to existing root structure of tree.

.2 Do not raise the existing level of soil at the base of the tree more than 15cm.

.3 Install groundcover leaving a circumference of 1 meter free of planting at tree base.

3.4 TRANSPORT AND STORAGE

.1 The topsoil must be protected from bad weather. Cover piles with plastic membrane or other impermeable membranes. The Contractor must avoid excessive compaction of the top soil stored on site.

3.5 FINISH GRADING

.1 Grade to eliminate rough spots and low areas, and ensure positive drainage. Loosen bed soil by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required density using equipment approved by the Engineer. Leave surfaces smooth, uniform and firm against deep foot prints.

.3 Remit the storage surfaces used for work, to the satisfaction of the Engineer.

3.6 ACCEPTANCE

.1 Engineer will inspect and test topsoil in place, and determine acceptance of the material, depth of topsoil and finished grade.

3.7 SURPLUS MATERIAL

.1 Dispose of non-required materials off-site.

END OF SECTION

1.0 GENERAL

1.1 SCOPE

.1 The Contractor shall supply materials, tools, labour and equipment required for complete execution of work in accordance with drawings and specifications:

.1 Hydraulic Seeding.

.2 The related work required by this section and included in work specified in the table of unit prices includes but is not limited to the following:

.1 Excavation, filling and surface preparation;
.2 Topsoil;
.3 Seed mixtures, mulches, tackifiers and erosion control blankets;
.4 Applications of seed mixtures;
.5 Fertilizers;
.6 Mechanical controls of weeds;
.7 Maintenance during the establishment and warranty periods.

1.2 RELATED SECTIONS

.1 Section 32 91 21 - Topsoil and Finished Grading

1.3 PRODUCT DATA

.1 Supply product data for the following:

.1 Seed;
.2 Mulch;
.3 Tackifier;
.4 Fertilizer.

1.4 WORK SCHEDULE

.1 Schedule hydraulic seeding to coincide with preparation of soil surface.

.2 Schedule work such that hydraulic seeding takes place between August 20 and September 19.

1.5 DELIVERY AND STORAGE

.1 Deliver and store the seed in its original containers on which should be recorded:

.1 composition of the seed mix;
.2 year of production;
.3 net weight;
.4 place and date of packaging;
.5 germination percentage;
.6 name and address of the supplier.

2.0 PRODUCTS

2.1 MATERIALS

.1 Seed: "Canada Pedigreed Grade" with a minimum 75% germination rate and a 97% purity rate in accordance with the Government of Canada Seeds Act and Regulations.

.1 Mixture compositions:

.1 50% Phleum pratense (Timothy);
.2 25% Poa trivialis (Rough-stalked Bluegrass);
.3 10% Agrostis alba (Red Top);
.4 8% Triofolium repens (Creeping White Clover);
.5 7% Medicago lupulina (Black Medic).

.2 Application rate: 250kg/ha.

.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 H1:
.1 Made from wood fibre (application rate 1400 kg/ha) mixed with tackifier added upon seeding. Tackifier application rates must comply with manufacturer’s recommendations;
.2 Organic matter content: 95%, ± 0,5%;
.3 pH value: 6,0;
.4 Potential water absorption: 900%.

.2 Type H3 for use on slopes steeper than 1:2:
.1 Fibre mixtures made from wood fibre or recycled newsprint mixed with tackifier or approved substitute, added upon seeding;
.2 Application rate:
.1 1 400 kg/ha for the fibre mixture;
.2 Tackifier application rates must comply with manufacturer’s recommendations.

.3 Wood fiber or straw mats over seeds and mulch. Mesh on the top of the wood fiber or straws, and completely in contact with the ground.

.4 Topsoil: as specified in Section 32 91 21;

.5 Water: free of impurities that would inhibit germination and growth;

.6 Fertilizer:

.1 To Canada "Fertilizers Act" and "Fertilizer Regulations";
.2 Completely synthetic, slow release with 35% nitrogen in water-insoluble form.

3.0 EXECUTION

3.1 WORKMANSHIP

.1 Take all precautions necessary to prevent spraying on structures, plant material, public utilities or any other object other than surfaces intended.

.2 Do not perform work under adverse field conditions such as wind speeds over 10km/h, frozen ground or ground covered with snow, ice or standing water.

.3 Immediately clean-up any material sprayed where not intended to satisfaction of the Engineer.

3.2 PREPARATION OF SURFACES

.1 Ensure that all surface areas are cultivated. Fine grade areas to be seeded free of bumps and hollows. Ensure areas are free of deleterious and refuse materials.

.2 Spread a layer of topsoil to a minimum thickness of 100mm.

.3 Outline the precise areas of mixtures to be applied using stakes or paint. Obtain the Engineer’s approval once the outlines are in place.

.4 Ensure areas to be seeded are moist to depth of 100mm before seeding.

.5 Obtain the Engineer's approval of grade and topsoil depth before starting to seed.

3.3 FERTILIZING PROGRAM

.1 Fertilize during the establishment period up to the final acceptance in accordance with a thrice yearly application program accepted by the Engineer.

3.4 APPLICATION OF SLURRY

.1 Apply the seed mixture according to the quantity shown below per hectare to be seeded:

.1 Seed: according to the application rate specified under Materials,
.2 Mulch: 1400kg;
.3 Water: use as much as necessary to obtain a mixture according to the manufacturer’s recommendation;
.4 Tackifier: at least 900 l or according to the rate specified in Materials or manufacturer recommendations.
.5 Apply slurry uniformly.

.6 Re-apply where application is not uniform.
.7 Remove slurry from items and areas not designated to be sprayed.

3.5 MAINTENANCE DURING THE ESTABLISHMENT PERIOD

.1 Perform following operations from the time of seed application until acceptance by the Engineer:

.1 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance;
.2 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts
.3 In compliance with regulations in effect, weed using mechanical methods.

3.6 ACCEPTANCE

.1 Seeded areas will be accepted by the Engineer provided that:

.1 Plants are uniformly established;
.2 Seeded areas are free of rutted, eroded, bare or dead spots;
.3 Areas have been fertilized.

.2 Areas seeded in fall will achieve final acceptance in the following spring, one month after start of growing season provided acceptance conditions are fulfilled.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 32 91 21 – Topsoil and Finished Grading.

1.2 SCHEDULING

.1 Schedule sod laying to coincide with preparation of soil surface.

.2 Schedule sod installation when frost is not present in ground.

2.0 PRODUCTS

2.1 MATERIALS

.1 Number One Turf Grass Nursery Sod: Sod that has been especially sown and cultivated in nursery fields as turf grass crop, according to BNQ 0605-300.

.1 Turf Grass Nursery Sod types:

.1 Number One Kentucky Bluegrass Sod: Nursery Sod grown solely from seeds of Kentucky Bluegrass cultivars of the following mix:
.1 40% Blue Knight;
.2 40% Creeping red fescue;
.3 10% Ryegrass;
.4 10% Bentgrass “Coloniale”;

.2 Turf Grass Nursery Sod quality:

.1 Not more than 2 broadleaf weeds or 10 other weeds per 40 square metres;
.2 Density of sod sufficient so that no soil is visible from height of 1500mm when mown to height of 50mm;
.3 Mowing height limit: 35 to 65mm;
.4 Soil portion of sod: 6 to 15mm in thickness.

.2 Water: clean and free from impurities which could prevent growth;
.3 Anchoring stakes: Wooden stakes 17mm x 17mm x 200mm.

2.2 SOURCE QUALITY CONTROL

.1 The sod and its source of origin must be approved by the Construction Engineer.

.2 When proposed source of sod is approved, use no other source without written authorization.

2.3 DELIVERY AND STORAGE

.1 Transport, discharge and store the sod only through the use of handling pallets.

.2 Sod must be delivered and installed within 24hrs of harvest.

.3 It is prohibited to deliver too small, asymmetrical or broken sods.

.4 In wet weather, let dry the sods sufficiently in order not to break them at the time of harvest and installation.

.5 In dry weather, protect the sods so that they do not dry completely and sprinkle them sufficiently in order to preserve their vitality and to prevent soil from coming loose during handling. The dry sods will be refused.

3.0 EXECUTION

3.1 PREPARATION

.1 Verify that grades are correct, and prepared according to Section 32 91 21 - Topsoil and Finished Grading.

.2 Do not perform work under adverse field conditions such as frozen soil, excessively wet soil or soil covered with snow, ice, or standing water.

.3 Fine grading of surface must be even, uniform and smooth exempt of humps and hollows, allowing the surface to drain naturally.

.4 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site.

3.2 SOD PLACEMENT

.1 Before commencement of the work the Engineer must approve the placement, slopes and finished depth of the topsoil.

.2 Lay the sods in parallel bands, while producing shifted joints. Tighten the ones against the others in order not to leave any vacuum, but without overlapping. Cut narrow or irregular sod lengths with a sharp tool.

.3 On slopes of 33% or greater, place anchoring stakes at a rate of three (3) per square metre. Place anchoring stakes 100 mm from the upper edge of sod and hammer stakes flush with grass surface.

.4 Roll with a light roller so as to adhere the sods to the ground by exerting a pressure varying between 2.5 and 4kg/m^2 (0,5 to 0,8lb/pi^2). It is prohibited to use a heavy roller to correct the irregularities of ground surface.

3.3 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until final project approval.

.2 Water grassed areas in sufficient quantity, and at frequency required to maintain optimum soil moisture condition to a depth of 100 mm.

.3 Stop erosion in grassed over areas by appropriate ways. Protect against damages from mechanical equipment. No additional compensation will be given for the protection of the grassed areas during the execution of the works.

3.4 ACCEPTANCE

.1 Turf grass nursery sod areas will be accepted by Engineer provided that:

.1 Grassed areas are properly established:

.1 Sod is free of bare and dead spots.

.2 Areas grassed in the fall will be approved the following spring one month after the beginning of the growing season as long as the specified conditions have been fulfilled.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 32 91 21 - Topsoil and Finish Grading.

1.2 REFERENCES

.1 Agriculture and Agri-Food Canada (AAFC):

.1 Plant Hardiness Zones in Canada-2000.

.2 Canadian Nursery Landscape Association (CNLA):

.1 Canadian Standards for Nursery Stock-2001.

1.3 STORAGE AND PROTECTION

.1 Protect plant material from frost, excessive heat, wind and sun during delivery.

.2 Immediately store and protect plant material which will not be installed within 1 hour after their arrival on site, in storage locations approved by Engineer.

.3 Protect plant material from damage during transportation:

.1 When delivery distance is less than 30km, and vehicle travels at speeds under 80km/h, tie tarpaulins around plants or over vehicle box.
.2 When delivery distance exceeds 30km or vehicle travels at speeds over 80km/h, use enclosed vehicle where practical.
.3 Protect foliage and root balls using anti-desiccants and tarpaulins, where use of enclosed vehicle is impractical due to size and weight of plant material.

.4 Protect stored plant material from frost, wind and sun and as follows:

.1 For bare root plant material, preserve moisture around roots by heeling-in or burying roots in [sand or topsoil,] and watering to full depth of root zone;
.2 For pots and containers, maintain moisture level in containers;
.3 For balled and burlapped, and wire basket root balls, place to protect branches from damage. Maintain moisture level in root zones.

1.4 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.2 Divert unused wood and mulch materials from landfill to recycling or composting facility approved by the Engineer.

1.5 SCHEDULING

.1 Obtain schedule approval from the Engineer, 7 days prior to shipment of plant material.

1.6 WARRANTY

.1 The Contractor hereby warrants that plant material, as itemized on plant list, will remain free of defects in accordance with warranty provisions of contract, for the duration of two (2) full growing seasons (2 years).

.2 End-of-warranty inspection will be conducted by the Engineer.

.3 The Engineer reserves the right to extend the Contractor's responsibilities warranty for an additional year if, at end of initial warranty period, leaf development, and growth is not sufficient to ensure future survival.

2.0 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 4B in accordance with Plant Hardiness Zones in Canada;
.2 Plant material must be planted in zone indicated as appropriate for its species;
.3 Plant material in location appropriate for its species.

.2 Plant material: Free of diseases, insects, defects or injuries and structurally sound with strong fibrous root system.

.3 Trees: With straight trunks, well and characteristically branched for species except where specified otherwise.

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 2440mm.

2.4 GUYING COLLAR

.1 Tube: Plastic, 13mm diameter, nylon reinforced.

2.5 TRUNK PROTECTION

.1 Plastic: perforated spiralled strip.

.2 Burlap: clean, minimum 2.5kg/m^2 mass and 150mm wide, and twine fastener.

2.6 MULCH

.1 Mulch is composed of 100% finely shredded cedar.

2.7 ANTI-DESICCANT

.1 Wax-like emulsion.

2.8 SOURCE QUALITY CONTROL

.1 Obtain approval from Engineer of the plant material prior to planting.

3.0 EXECUTION

3.1 PRE-PLANTING PREPARATION

.1 Ensure plant material is found acceptable by the Engineer.

.2 Remove damaged roots and branches from plant material.

.3 Apply anti-desiccant to conifers and deciduous trees leaves, in accordance with manufacturer's instructions.

3.2 EXCAVATION AND PREPARATION OF PLANTING BEDS

.1 For individual planting holes:

- .1 Stake out location and obtain approval from the Engineer, prior to excavating;
- .2 Unless otherwise indicated, 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 materials;
- .4 Scarify sides of planting hole;
- .5 Remove water which enters excavations prior to planting. Notify the Engineer if water source is ground water.

3.3 PLANTING

.1 For burlapped root balls, cut away top one third of wrapping and wire basket without damaging root ball. Do not pull burlap or rope from under root ball.

.2 For container stocks or root balls in non-degradable wrapping, remove entire container or wrapping without damaging root ball.

.3 Plant materials vertically in locations as indicated. Position and dispose plant material to give best appearance in relation to structures, roads and sidewalks.

.4 For trees and shrubs:

.1 Backfill soil in 150mm layers. Tamp each layer to eliminate air pockets. When two thirds of depth of planting pit has been backfilled, fill remaining space with water. After water has penetrated into soil, backfill to finish grade;
.2 Form watering recipient (saucer) as indicated.

.5 Water plant material thoroughly.

.6 After soil settlement has occurred, fill with soil to finish grade.

.7 Dispose of burlap, wire and container material off site.

3.4 TRUNK PROTECTION

.1 Install trunk protection on deciduous trees as indicated.

.2 Install trunk protection prior to installation of tree supports.

3.5 TREE SUPPORTS

.1 Install tree supports as indicated.

.2 Use single stake tree support for deciduous trees less than 3m, and less than 2m for evergreens:

.1 Place stake on prevailing wind side, at a 150mm distance from trunk;
.2 Drive stake minimum 150mm into undisturbed soil beneath roots. Ensure stake is secure, vertical and not split;
.3 Install 150mm long guying collar 1500mm above grade;
.4 Thread Type 1 guying wire through guying collar tube. Twist wire to form collar and secure firmly to stake. Cut off excess wire.

.3 After tree supports have been installed, remove broken branches with clean, sharp tools.

3.6 MULCHING

.1 Ensure soil settlement has been adjusted to compensate for compaction prior to mulching.

.2 Spread mulch as indicated.

3.7 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following maintenance operations from time of planting until the project has been approved by the Engineer.

.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 freezing weather, in order to saturate soil around root system;
.2 Remove weeds;
.3 Replace or re-spread 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 diseases, use appropriate control methods in accordance with Federal, Provincial and Municipal standards and regulations. Obtain product approval from the Engineer prior to application. Use of pesticides requires approval from Gatineau Park Biologists;
.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 and unhealthy plants. Make replacements in same manner, as specified for original planting.

3.8 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following maintenance operations from time of the Engineer's approval until the end of the warranty period:

.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 re-spread damaged, missing or disturbed mulch;
.5 For non-mulched areas, cultivate monthly to keep top layer of soil friable;
.6 If required to control insects, fungus and disease, use appropriate control methods in accordance with Federal, Provincial and Municipal regulations. Obtain product approval from the Engineer prior to application. Use of pesticides requires approval from Gatineau Park Biologists;
.7 Remove dead, broken or hazardous branches from plant material;
.8 Keep trunk protection and tree supports in proper repair and adjustment.
.9 Remove trunk protection, tree supports and level watering saucers at end of warranty period;
.10 Remove and replace dead and unhealthy plants. Make replacements in same manner as specified for original plantings.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 31 05 17 – Aggregates.

.2 Section 31 23 17 – Rock Removal.

.3 Section 31 24 13 – Roadway Embankments.

.4 Section 32 11 19 – Granular Sub-Base.

1.2 MEASUREMENT PROCEDURES

.1 Supply and installation of pipe culvert will be measured in metres in place for each size, type and class of pipe.

.2 Required granular material for culvert bedding and backfill, trench backfill and compacting, will be included in the culvert's unit price. See section - 00 22 20 Pay items – for details

1.3 SAMPLES

.1 Inform Engineer at least 2 weeks prior to commencing work, of proposed source of bedding materials and provide access for sampling.

1.4 MATERIAL CERTIFICATION

.1 Submit manufacturer's test data and certification at least 4 weeks prior to commencing work.

.2 Certification to be marked on pipe.

2.0 PRODUCTS

2.1 PIPES

.1 Aluminized type 2 - Corrugated Steel Pipe CAN/CSA G401-07 (R2013)
« Corrugated Steel Pipe Products » conform to Standard 7101 from Transports Québec (MTQ)

2.2 GRANULAR BEDDING AND BACKFILL

.1 Granular bedding and backfill from a source approved by the Engineer and in conformity to Section 31 05 17- Aggregates.

.2 Culverts to be installed as per the details included in drawings and specifications.

2.3 CUT-OFF WALLS

.1 Precast concrete cut-off wall conforming to MTQ standard 3101 and 5101.

3.0 EXECUTION

3.1 TRENCHING

.1 Do trenching work in accordance with Section 31 24 13- Roadway Excavation, Embankments and Compaction.

.2 Obtain Engineer's approval of trench line and depth prior to placing bedding material or pipe.

3.2 BEDDING

.1 Dewater excavations, as necessary, to allow placement of culvert bedding in dry condition.

.2 Place minimum thickness of approved granular material on bottom of excavation and compact to minimum 95% of dry maximal density, as indicated on drawings and specifications.

.3 Shape bedding to fit lower segment of pipe exterior so that width of at least 10% of pipe diameter is in close contact with bedding and to camber as indicated or as directed by Engineer, free from sags or high points.

.4 Place bedding in unfrozen condition.

3.3 CUT-OFF WALL

.1 Precast concrete cut-off walls at culvert ends in accordance with details and specifications.

3.4 LAYING PIPE CULVERTS

.1 Commence pipe placing at downstream end.

.2 Ensure bottom of pipe is in contact with shaped bed or compacted fill throughout its length.

.3 Lay pipe with outside circumferential laps facing upstream and longitudinal laps or seams at side or quarter points.

.4 Do not allow water to flow through pipes during construction except as permitted by Engineer.

3.5 BACKFILLING

.1 Backfill around and over culverts according to drawings and details.

.2 Place granular backfill material approved by Engineer, in 300mm layers to full width, alternately on each side of culvert, so as not to displace it laterally or vertically;

.3 Compact each layer to 90% of the test «Modified Proctor» taking special care to obtain required density under haunches;

.4 Place backfill in unfrozen condition;

.5 Protective coating on culvert extremities installed according to drawings and specifications.

END OF SECTION

1.0 GENERAL

1.1 SCOPE

.1 This special provision covers the requirements to supply and install the following culvert liners into the existing culverts. The required lining method is cured-in-place pipe (CCIP). Culverts are listed in table 1. Prior to commencing the work or ordering any material, the Contractor shall validate culvert diameter and length and conditions.

.2 The NCC is not providing any receiving sites for disposal of material.

.3 No work shall be carried out at any time without a valid work permit. No work shall be started if the NCC's Inspector isn't on site.

2.0 CULVERT LOCATION

TABLE 1

Location	Station	Identification No.	Northing	Easting	Dia.	Length	Material
Gatineau Parkway	2+100	Culvert No. 94	356717	5042954	600 mm	20 m	CSP
Gatineau Parkway	2+550	Culvert No. 95	356304	5043043	900 mm	32 m	CSP

3.0 REFERENCE

.1 This section refers to the American Society for Testing of Materials (ASTM) Standards. These standards are an integral part of the contract documents and the Contractor shall refer to the latest versions and revisions.

.2 Culvert rehabilitation done by liner insertion must conform to the following standards:

.1 ASTM F1216-09 Standard Practice for rehabilitation of Existing Pipelines and conduits by the inversion and curing of a Resin-Impregnated Tube;
.2 ASTM D-790-10 Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

4.0 PRELIMINARY WORK

.1 The work includes, without limitation, culvert cleanout and reaming, water pumping and control, culvert ends replacement, riprap and site reinstatement.

5.0 MATERIALS

5.1 RESIN

.1 Mechanical Resistance

.1 The liner must meet the following minimum mechanical resistance requirements:

.1 Flexural strength ASTM D-790-10 - 31 MPa;
.2 Modulus of elasticity in flexion ASTM D-790-10 - 1724 MPa.

.2 The Contractor shall submit, with his bid, the current resistance of the proposed products. Once the installation is completed, the liner shall withstand the following environment conditions:

.1 Internal and external pressure applied:

.1 Soil bacteria attack;
.2 Dead loads (weight of soils and water);
.3 Vehicular loads.

.3 Additions of Catalysts

.1 Catalysts that ensure thermo-setting of the resin will be added in precise proportions, using a variable speed mixer. The speed of the mixer should be controlled to prevent the formation of air bubbles. The duration of mixing will be done according to the special recommendations of the supplier.

5.2 CIPP Design

.1 The liner consists of a polyurethane tube lined with layers of felt and polyester – denier 15.

.2 The liner is manufactured to mold perfectly, after polymerisation, the internal perimeter of the culvert to rehabilitate, leaving no space or gap between the existing culvert and the liner. During the design stage of the liner, the circumferential stretching of normally 5% will be taken into consideration.

.3 The thickness of the liner must comply with the requirements of the ASTM F1216-09 for a totally deteriorated culvert.

.4 The design calculations must be based on section XI.2.2 of ASTM 1216-09. Calculations based on any other standard will be formally rejected.

.5 The Contractor shall supply a stamped design calculation for the thickness of the lining CIPP. The following data shall be used for the conception:

.1 Fully deteriorated host pipe;
.2 Manning's of host pipe 0,024;
.3 Pipe depth as determined by contractor following a visit/survey;

.4 Expected durability of 50 years;
.5 Water table equal to top of road;
.6 Ovality 20% or less;
.7 Safety factor of 2 minimum;
.8 Live load as per HS-20;
.9 Long term retention factor 50%;
.10 Excepted thickness of CIPP of 1 inch.

.6 Once the contract is signed, the Contractor shall submit a soil analysis, technical assumptions, calculations and the final drawing showing the thickness of the liner as well as a selection of the resin system he intends to use.

6.0 QUALITY ASSURANCE

6.1 PRODUCT QUALIFICATIONS

.1 It is the Tenderer's responsibility to demonstrate, to the satisfaction of the Engineer, that the liner he intends to use will mold perfectly the inner wall of culverts to rehabilitate. No deviation of the requirements indicated in this specification will be authorised.

6.2 REQUIRED TESTS

.1 For each section of liner, the Contractor shall provide the NCC project manager with at least one cylindrical sample of this liner of at least 200mm in length. The sample must be an extension of the liner which is installed in this section. In order to correspond to the section of the liner, the sample must be produced under conditions which are as close as possible to the existing conditions. These samples must be delivered to the NCC the day following insertion. Each sample must be identified: route, culvert number, station, date, etc. The NCC reserves the right to perform the required tests in order to verify the liner's and Mechanical properties. These tests will be carried out in accordance with standard ASTM D-790, at the expense of the NCC. The Contractor will be required to redo work for CIPP that don't comply with the mechanical strength stipulated in the specification.

7.0 EXECUTION

7.1 CULVERT CLEANOUT

.1 The Contractor shall thoroughly cleanout culverts identified in the documents. This cleanout operation must be done using the equipment necessary to remove all dirt, grease, stones, sand and other material that may adversely affect the rehabilitation work. The Contractor must take care not to damage the culvert during the cleanout operations.

.2 The Contractor shall also perform the reaming work required to eliminate any obstruction such as roots, sharp edges in the culvert, etc.

.3 Culvert cleanout materials shall otherwise be managed by one, or a combination of, the following:

.1 As a composite material without dewatering; or
.2 By dewatering and subsequent management of debris component.

.4 Receiving sites shall be arranged for and provided by the Contractor.

.5 It is the Contractor's responsibility to obtain any approvals, releases, and agreements that are required to implement the Contractor's strategy for the management of culvert cleanout material.

7.2 BRUSH CLEARING

.1 Contractor shall perform brush clearing as necessary to prepare site for work execution

.2 Remove unwanted cleared and grubbed materials off site to disposal site approved by Engineer.

7.3 DEWATERING OPERATIONS INCLUDING SITE REHABILITATION

.1 The Contractor shall perform dewatering operations to allow the rehabilitation of culverts of various diameters.

.2 Dewatering work includes without limitation all blocking equipment (sand bags, dams, etc.), pumping equipment and accessories (pump of sufficient capacity, well pump, etc.) necessary to isolate upstream and downstream segments on which rehabilitation work is performed. The equipment must be in good condition and produce minimum noise in order to comply with local regulations.

7.4 SITE REINSTATEMENT

.1 Contrator should reinstate site to its initial condition after completing the lining of the pipes.

.2 Reinstatement includes, but is not limited to, sod or seeding, top soil, pavement, repair of damaged structures caused by lining work, etc.

.4 The Contractor shall ensure that the equipment used is sufficient in quantity and capacity in relations to site conditions.

.5 The Contractor must have on site sufficient qualified personnel to monitor the dewatering operations.

.6 When blocking and dewatering equipments are in place, the Contractor must ensure a complete monitoring of the system.

7.5 LINER

1 Manufacturing of liner

.1 Liner

.1 The Contractor shall take the necessary measures to ensure an adequate permeation of the liner.
.2 The finished liner shall be continuous along the length of the culvert, free of visible defects such as holes, foreign bodies, regions not permeated, air bubbles, etc.
.3 The interior surface shall be free of cracks. In addition, the liner must mold the profile of the existing culvert.
.4 The liner must be manufactured in a continuous length, seamless, from one end of the culvert to the other.

.2 Polymerisation

.1 Curing

.1 The thermal cycle varies depending on the type of resin utilised, thickness and length of the liner.
.2 Once the insertion is completed, the Contractor is required to provide all equipment, personnel and monitoring equipment necessary to carry out the curing process. He shall supply all the energy sources to operate and maintain curing equipment as well as site lighting if necessary.

.2 Cooling

.1 The cooling operation shall meet the selected CIPP manufacturer’s requirements.

.3 Cutting the Liner

.1 The ends of the CIPP shall be cut up to each culvert ends.

.4 Liner

.1 The manufacturer makes the liner so that it molds perfectly the inner wall of the culvert to rehabilitate. The finished liner shall be continuous along the entire length of the culvert, free of visible defects such as voids, imprisoned foreign bodies, air bubbles, small perforations, blisters and or other defects. The liner must be waterproof, allowing no leakage of the contents in the culvert to the surrounding soil or vice versa.
.3 The polyurethane waterproof membrane, bonded permanently to the felt liner, remains in place and is the interior finish of the restored culvert.
.4 Any other defect that may affect the integrity or resistance of the liner, in the foreseeable future, must be repaired by the Contractor at his expense. In cases where a repair is impossible, the Contractor shall replace the liner at his own expense.

.5 The manufacturer shall produce the liner in continuous lengths, seamless between the points of access to the culvert, unless the provision of such joints is authorized by the Engineer and the NCC Project Manager. To determine the exact length of liner required, the manufacturer must take into account the installation method used and the amount of horizontal stretching expected during that particular installation method.

.3 Measuring and Method of Payment

.1 Refer to section 00 22 20 “Pay items description”

8.0 RESPONSABILITY

.1 The Contractor assumes responsibility for all damages or accidents caused by his agents, employees or workers to NCC staff or property as well as to companies, corporations or individuals. The monitoring exercised by the NCC or the Engineer to ensure proper performance of the work does not exempt the Contractor in any way of his responsibilities for damages, accidents or the quality of the work.

9.0 REFERENCES AND ACCREDITATIONS

.1 The Tenderer must prove that he is able to carry out the culverts rehabilitation work. He must include with his bid a list of municipalities for which he has performed this type of work. The Contractor must be formally certified as an 'authorised installer' by the liner manufacturer, and submit, with his bid, a written confirmation from the manufacturer to that effect.

10.0 WARRANTY

.1 The culvert rehabilitation work must be warrantied for a period of three (3) years from the date of the provisional acceptance of works.

11.0 SPECIFIC MITIGATION MEASURES FOR CULVERT LINING WORK

The requirements and general mitigation measures apply to the cleaning of culverts by use of a vacuum truck system. All general mitigation measures also apply to the culverts which will also require insertions, in addition to the specific measures outlined below for that particular maintenance work. Any culvert specific measures are listed at the end of the document.

All measures should be reviewed and understood prior to commencement of any work.

GENERAL MITIGATION MEASURES

Culvert Access

.1 Vacuum truck must remain within paved area of the road to the extent possible or limit encroachment onto road shoulder. It is prohibited to circulate outside of the limits of the road shoulder in order to avoid damage to vegetation.

.2 Use existing trails, roads, or cut lines wherever possible to avoid disturbance to the riparian vegetation. (DFO 2013a).

.3 Machinery is prohibited to circulate within the watercourse

.4 Do not store material or equipment within 30 meters of all water bodies.

Vegetation Removal

.1 All trees within 2 m of equipment in operation and susceptible to being damaged will have protectors installed around their drip line (e.g. protective fencing);

.2 No tree (DBH > 10cm) may be cut. If trees with a DBH higher than 10 cm were to be cut, an authorization from the Park's Natural Resources and Land Management Section is required. These trees will have to be replaced, at a 2:1 ratio, with non-invasive indigenous species to the Park, approved by the Park's biologists. The contractor's tree planting plan must be approved by NCC prior to the tree planting.

.3 Minimize vegetation cutting (DBH < 10 cm), limiting it to vegetation that interferes with the movement of machinery and work.

.4 Any federally or provincially protected tree species (seedling, sapling or tree) must be properly flagged and protected to ensure these trees are not damaged, harmed or cut. Highly visible flagging tape (using a pre-determined colour) should be used to clearly identify the tree. Presence of such species should be reported to the Park's Natural Resources and Land Management Section. These species include Butternut (Juglans cinerea), Rock Elm (Ulmus thomasii)) and Black Maple (Acer nigrum).

.5 Any wood from ash trees that is trimmed or cut must be left on site in order to slow the spread of emerald ash borer.

Migratory Birds

.1 No activities susceptible to disturb or destroy the nest of a migratory bird can occur during the nesting period (activities permitted between August 16 and March 31 only) as per the Migratory Bird Convention Act.

Sediment and Erosion Control

.1 Install effective sediment and erosion control measures before starting work to prevent sediment from entering the watercourse. Inspect them regularly during the course of debris removal and make all necessary repairs if any damage occurs. (DFO 2013a)

.2 Maintain existing riparian vegetation in order to help reduce erosion.

Timing of Removal of Accumulated Material

.1 Work should be undertaken outside of the fish spawning period and periods of high flooding (March 31st to July 1)

.2 Avoid maintenance activities during wet and rainy periods (GoBC and DFO)

.3 Unless accumulated material (i.e., branches, stumps, other woody materials, garbage, ice build-up, etc.) is preventing the passage of water and/or fish through the structure, time material and debris removal to prevent disruption to sensitive fish life stages by adhering to appropriate fisheries timing windows (see above).

Debris Removal

.1 Limit the removal of accumulated material (i.e., branches, stumps, other woody materials, garbage, etc.) to the area within the culvert, immediately upstream of the culvert and to that which is necessary to maintain culvert function and fish passage. (DFO 2013a)

.2 Remove accumulated material and debris slowly to allow clean water to pass, to prevent downstream flooding and reduce the amount of sediment-laden water going downstream. Gradual dewatering will also reduce the potential for stranding fish in upstream areas. (DFO 2013a)

.3 When water (from the truck) is flushed through the culvert, it must be done at a slow speed (gently) as to prevent sedimentation and impacts downstream.

.4 Depending on the sensitivity of the downstream fish habitat and amount of sediment in the culvert, installing cofferdams and working in the dry prior to vacuuming should be considered.

.5 Temporary structures and environmental protection devices must ensure sufficient free movement of water at all times to maintain fish habitat functions (feeding, fry rearing, spawning) downstream from the work site. Take the necessary measures to prevent impacts (e.g. flooding, dewatering, suspended solids, erosion) upstream and downstream of the work site.

Machinery Maintenance

.1 The smallest possible machinery and equipment suitable for the bearing capacity of the soil should be used.

.2 Machinery is to arrive on site in a clean condition and is to be maintained free of fluid leaks.

.3 It is prohibited to circulate beyond the boundaries of the work site and leave equipment, waste or other materials, even temporarily without the prior authorization of the NCC.

.4 Wash, refuel and service machinery and store fuel and other materials for the machinery at least 60m away from the high water mark to prevent any deleterious substance from entering the water.

.5 Keep an emergency spill kit on site in case of fluid leaks or spills from machinery.

Site Reinstatement (if required)

.1 Disturbed surfaces will be rehabilitated at the end of the work using the Gatineau Park approved seed mixture

.2 Rehabilitation of the site must use topsoil and seed with the following approved mixtures (percentages may vary; substitutions must be approved):

50% Phleum pratense (Timothy);
25% Poa trivialis (Rough-stalked Bluegrass);
10% Agrostis alba (Red Top);
8% Triofolium repens (Creeping White Clover);
7% Medicago lupulina (Black Medic).

.3 Revegetation must be done as soon as possible. If there is insufficient time remaining in the growing season, the Contractor must stabilized disturbed areas with erosion control blankets to keep the soil in place and prevent erosion in water bodies. Blankets must be removed only at the end of the revegetation work

.4 All tree or vegetation debris that may fall or enter any water bodies must be removed immediately.

Management of Material

.1 All sludge, dirt, sand, rocks, grease, and any other solid or semi-solid material resulting from the cleaning operation shall be removed at the downstream end of the culvert being cleaned (either manually or with suction). The Contractor shall maintain record of the amount and type of material removed for each culvert in a format approved by the NCC.

.2 Debris shall be kept in totally enclosed containers at all times and shall be removed from the site at the end of each day or when the containers are full. Under no circumstances will the Contractor be allowed to accumulate debris, etc. on site of work beyond the stated time. All debris shall be removed from the site and disposed by the Contractor at no additional cost to the NCC.

Fauna

.1 In order to minimize the impact on wildlife, all work will be completed within a reasonable time frame.

.2 In order to limit potential collisions with terrestrial fauna, maximum speed permitted on trails is 10 km/h.

.3 Workers must keep the work site clean and must not leave behind garbage or food scraps that could attract animals or alter their behaviour.

.4 Workers will avoid wilfully disturbing any wildlife at the site.

.5 Any fauna (mammals, amphibians, reptiles) that are encountered within the work site should not be harmed or harassed. Allow the animal to move away on its own by slowly walking toward it in the direction you want it to move. If necessary to move the animal out of the work area, carefully move it into a similar habitat next to site (within same area).

LINING MITIGATION MEASURES

Contractors must also follow the general mitigation measures for culvert cleaning.

Working around Water

.1 Machinery is prohibited from circulating within the watercourse; if the work is to be done with machinery, it will operate from road or outside of the watercourse in order to minimize disruption to the banks and the bed of the watercourse.

.2 Any wetland impact on NCC lands should be avoided whenever possible. The NCC must be informed of any work that can have a direct impact on a wetland present on site. If wetlands are disturbed during work, negative effects must be minimized.

Vegetation Removal

.1 No tree (DBH > 10cm) may be cut. If trees with a DBH higher than 10 cm were to be cut, an authorization from the Park's Natural Resources and Land Management Section is required prior to removal. Any trees (DBH > 10cm) should be identified (size and species) as soon as possible by the contractor to ensure the project is not delayed. It is recommended that any requirements for tree cutting (for access routes and staging areas) be identified early.

.2 If ash trees are to be cut or pruned, all the wood from the tree (i.e. logs, brachnes, wood chips) must be left on site in order to prevent the spread of emerald ash borer.

.3 No tree or branches should fall into the watercourse. In the event that this occurs, it should be removed immediately.

.4 Minimize vegetation removal to the extent possible.If any tree roots are encountered, procedures should be implemented to minimize potential impact to the tree(s);

Site Reinstatement

.1 Rehabilitation work of shoreline can not include any modification to streambed (i.e. no materials such as rocks or sand should be added to the watercourse). Rehabilitation includes only plantings along shorelines and within other areas on land (road shoulder, access route).

.2 Any trees (DBH > 10cm) will have to be replaced, at a 2:1 ratio, with non-invasive indigenous species to the Park, approved by the Park's biologists. The contractor's tree planting plan must be approved by NCC prior to the tree planting.

.3 If there is insufficient time remaining in the growing season, the site should be stabilized (e.g. cover exposed areas with erosion control blankets to keep the soil in place and prevent erosion) and vegetated the following spring using approved native species.

END OF SECTION

1.0 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 35 30 – Health and safety

.2 Section 01 35 43 – Environmental Procedures

.3 Section 33 42 13-A – Pipe Culverts

1.2 ENVIRONMENTAL REQUIREMENTS

.1 Dumping excavation debris, remains and waste materials in watercourse is prohibited.

2.0 PREPARATION

.1 Obtain work permits from governing Federal, Provincial and/or Municipal authority responsible for environment protection.

3.0 EXECUTION

3.1 EXISTING CONDITIONS

.1 Maintain existing flow pattern in natural watercourse systems, unless otherwise specified.

.2 In natural systems maintain existing riffle/pool and step/pool patterns.

3.2 DRAINAGE

.1 Pumping water containing suspended materials into watercourse is prohibited.

.2 Authorised dewatering methods are presented in Section 01 35 43 – Environmental Procedures.

.3 Pre-dams shall be constructed using stones that are clean, free of dirt and debris of any kind.

3.3 MITIGATION MEASURES

.1 Machinery is not permitted within the watercourse and must remain within the designated work and storage areas.

.2 Do not perform earthwork or excavation near streams or wetlands during periods of flooding or heavy rain (approx. mid-March to June 1).

.3 No complete obstruction of fish passage during timing windows. Work should be undertaken outside of the fish spawning period and periods of high flooding (April 1st to July 15th and October 1st to May 31th). Therefore, work can occur in fish habitat between July 16th and September 30th. Dates could vary depending on fish species present.

.4 If there is water flow in the watercourse at the time of the work, ensure sufficient free movement of water at all times to maintain fish habitat functions (feeding, fry rearing, spawning). Take the necessary measures to prevent impacts (e.g. flooding, dewatering, suspended solids, erosion) upstream and downstream of the work site.

.5 Work can be done in isolation of flowing water.

.6 No temporary or permanent increase in existing footprint below the High Water Mark.

.7 No new temporary or permanent fill placed below the High Water Mark.

.8 No channel realignment or narrowing of the channel is permitted.

.9 Ensure required temporary pumping or cofferdam so work site areas are kept dry. Temporary facilities and environmental protection measures shall maintain passage of water and/or fish at all times to prevent disruption to sensitive fish life stages and habitat.

.10 If work is carried out while stream is flowing, ensure that water continues flowing freely during work, due to potential presence of fish.

.11 Water pumped upstream must be returned to its normal bed downstream of work. In addition, for parallel culverts only, one can be used to maintain flow while the other is being reconstructed.

.12 Provide sediment traps during construction activities if the stream is active.

.13 Where dewatering is required, effluent shall be discharged in a manner that will prevent sediments from entering watercourses.

.14 During the works, the Contractor must create a recovery plan for fish that are kept in temporary structures in order to immediately return them to the waterbody in order to ensure no fish mortality.

.15 Maintain existing flow pattern in natural watercourse systems, including riffle/pool and step/pool patterns.

.16 If possible, do not use paint, glue and sealant within 15 meters of watercourse or wetland area. If this is not possible, ensure the use of sealed containers to prevent the risk of spills.

3.4 SITE RESTAURATION

.1 Following construction work, the Contractor must restore the profile and substrate of the waterbody to the original state upstream and downstream of the culvert.

.2 When work is completed, remove all temporary installations used as watercourse crossings, restore normal flow, stabilize and rebuild streambed and banks according to their natural profile, if need be.

.3 Maintain effective sediment and erosion control measures until re-vegetation of the disturbed areas is achieved.

.4 Rehabilitation of the site must use topsoil and seed with the following approved mixture (percentages may vary; substitutions must be approved):

50% Phleum pratense (Timothy);
25% Poa trivialis (Rough-stalked Bluegrass);
10% Agrostis alba (Red Top);
8% Triofolium repens (Creeping White Clover);
7% Medicago lupulina (Black Medic).

.5 Re-vegetation must be completed as soon as possible, at a proper time for the regrowth of the vegetation. If there is insufficient time remaining in the growing season, the Contractor must stabilize disturbed areas with erosion control blankets to keep the soil in place and prevent erosion into the waterbodies. Blankets must be removed only at the end of the re-vegetation work.

.6 Shrub species must be endemic to the area, non-invasive and approved in advance by Gatineau Park Biologists.

.7 The natural wetland drainage pattern, within or outside the work area, must be restored to its original condition following work completion.

.8 Specific species required for wetland restoration need to be non-invasive, native to Gatineau Park and approved in advance by Gatineau Park Biologists.

END OF SECTION