Parcs Canada Parks Canada

PARKS CANADA AGENCY

FORT CHAMBLY NATIONAL HISTORIC SITE
REHABILITATION OF SOUTHWEST RETAINING WALL

Parks Canada Ref.: 2369
SNC-Lavalin Ref.: 628545-1000

TECHNICAL SPECIFICATIONS
FOR TENDER

SNC-Lavalin inc.
2271, blvd. Fernand-Lafontaine
Longueuil (Québec)
J4G 2R7
Phone : 514-393-1000
Fax : 450-651-0885

July 15, 2015

Signature page:

Prepared by:

Signed on the French version on July 15, 2015

Caroline Moisan, ing., M.Sc.A.
(Structure)

Signed on the French version on July 15, 2015

Nicolas Giguère, ing., D.E.S.S.
(Structure)

Signed on the French version on July 15, 2015

Christophe Delcourt
(Environmental)

Signed on the French version on July 15, 2015

Yves Comtois
(Environmental)

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GENERAL REQUIREMENTS

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Organization and layout of the worksite, site guarding and safety are paid all together.

.2 The schedule is paid all together.

1.2 INCIDENTAL WORK

.1 If the Departmental Representative requests Work over and above that specified in the plans and which is not related to the items on the work order, such Work shall be payable as stipulated in the article “Provision for Incidental Work” on the work order. Execution of such Work shall not constitute a reason to extend the deadline for completing the Work awarded to Contractor.

.2 Moreover, at the end of each work day the Departmental Representative and Contractor shall compare their respective logs of time payable and material used in order to agree on a common document, signed in duplicate by each party, one copy of which shall go to the Department and the other to Contractor.

.3 Payments shall be calculated based on the actual costs of Contractor and subcontractors, and shall include taxes and other fees imposed by any other competent authority on labour, materials, heavy machinery, miscellaneous equipment, small tools and other required material, and to which Contractor is subject.

.4 All Contractor statements of account shall be detailed and accompanied by the required supporting documents.

.5 Payment calculations shall include all other costs of labour, materials, heavy machinery, miscellaneous equipment, small tools and other required material, not specified and attributable to changes in conditions.

.6 When Contractor carries out the Work, 15% shall be added to the cost of labour, material and other fees. When a subcontractor carries out the Work, 15% shall be added to the cost of labour, material and other fees for the subcontractor, and 10% shall be added to the new total for Contractor.

.7 When the type of material is the responsibility of Contractor, nothing shall be added to the cost of heavy machinery, miscellaneous equipment, small tools and other material. When the type of material is the responsibility of a subcontractor or supplier, 10% shall be added to the cost of heavy machinery, miscellaneous equipment, small tools and other material for Contractor and nothing shall be added for the subcontractor or supplier.

.8 When the type of material is the responsibility of Contractor, 15% shall be added to the cost of heavy machinery, miscellaneous equipment, small tools and other material for Contractor. When the type of material is the responsibility of a subcontractor, 15% shall be added to the cost of internal rental of heavy machinery, miscellaneous equipment, small tools and other material for the subcontractor, and 10% shall be added to the new total for Contractor.

.9 Ten percent shall be added to the cost billed for heavy machinery, miscellaneous equipment, small tools and other material for Contractor and nothing shall be added for the subcontractor. When the type of material is the responsibility of a supplier, 15% shall be added to the cost billed for heavy machinery, miscellaneous equipment, small tools and other material for Contractor if the latter performs the Work. Fifteen percent shall be added to the cost billed for heavy machinery, miscellaneous equipment, small tools and other material for the subcontractor, and 10% shall be added to the new total for Contractor if the Work is carried out by a subcontractor.

.10 Ten percent shall be added to the cost of bulk transportation when such transportation is by trucks or a group of dump vehicles designed to travel on public roads and belonging to operators of heavy vehicles appearing in the Registre du camionnage en vrac of the Commission des transports du Québec and being clients of a brokerage firm that holds a brokerage permit. Nothing shall be added in the case of trucks belonging to Contractor.

1.3 WORK COVERED BY CONTRACT DOCUMENTS

.1 The Work covered by this contract includes rehabilitation of the southwest retaining wall of the Fort Chambly national historic site. All related work and site rehabilitation are also included.

1.4 THIRD-PARTY WORK

.1 Work in collaboration with other Contractors (if required) and carry out the instructions of Parks Canada Agency Representative.

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

1.5 WORK SEQUENCE

.1 Construct Work in stages to accommodate Department’s continued use of premises during construction.

.2 Co-ordinate Progress Schedule and coordinate with Department occupancy during construction.

.3 Construct Work in stages to allow continued use of the premises adjacent to the Work and public access to Fort Chambly.

1.6 CONTRACTOR USE OF PREMISES

.1 Limit use of premises for Work, for storage and for access, to allow:

.1 Department occupancy.

.2 Work by other contractors if required.

.3 Public usage.

.2 Coordinate use of the premises according to the directives of Parks Canada Agency (PCA) Representative.

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

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

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

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

1.7 OWNER OCCUPANCY

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

.2 Cooperate with Department in scheduling operations to minimize conflict and to facilitate Department usage.

1.8 EXISTING SERVICES

.1 Notify Departmental Representative and utility companies of any intended interruption of services and obtain required permission.

.2 Before commencing work, establish location and extent of utility lines in area of Work and notify Departmental Representative of findings.

.3 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.

.4 Provide temporary services when directed by Departmental Representative to maintain all existing systems.

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

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

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

.8 Construct barriers in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

1.9 DOCUMENTS REQUIRED

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

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Reviewed Shop Drawings.

.5 List of Outstanding Shop Drawings.
.6 Change Orders.
.7 Other Modifications to Contract.
.8 Field Test Reports.
.9 Copy of Approved Work Schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Other documents as specified.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Archeology

3.1 SPECIAL CONDITIONS

.1 The Canadian government has recognized the Fort Chambly national historic site as among those sites having the highest heritage value. Thus on this property all soil excavations recognized as possibly containing archeological remains shall be under the surveillance of an Archeologist designated by the federal government.

.2 Because of the probability of finding graves during the excavations required to rehabilitate the retaining wall along the Richelieu River and the stream near the former cemetery, to the west of Fort Chambly, this Work shall be under constant archeological surveillance.

3.2 ACCESS AND COLLABORATION

.1 Contractor shall cooperate and comply with all directives from the Project Manager during excavations in order to prevent any loss of archeological information on the site.

.2 Contractor shall facilitate access to the Work and collaborate with the Archeologist. The Archeologist or the Archeologist's Representative shall be on duty at the site, as required to protect and record the remains. Their role shall be to guide Contractor in order to prevent any loss of archeological information and to gather information on the remains.

.3 Contractor shall allow the team of Archeologists to perform archeological examinations and measurements.

3.3 ARCHEOLOGICAL DISCOVERIES

.1 Contractor shall inform Parks Canada Representative or, in the absence thereof, the Archeologist or the Archeologist's Representative of any discovery of graves or indications of graves on the site and await directions before continuing the Work.

Remains, antiquities and other items of historical, archeological or scientific interest (remains, object or fragment of an object) found on the site or in the zones to be excavated or demolished shall remain the property of the Crown. Contractor shall protect them and obtain directions from the Project Manager in this regard.

3.4 WORK STOPPAGE

.1 Contractor shall allow in the contract, at Contractor's expense, for stoppages of thirty (30) minutes per half-day of excavation in areas requiring the presence of the Archeologist (as described in point 1.1 of this section). These stoppages, if not used, shall accumulate and may be used later as needed. A statement of unused time shall be kept by Parks Canada's Representative in agreement with Contractor and the Archeologist.

Om the case of a stoppage exceeding 30 minutes, Parks Canada Representative shall assess the implications of the stoppage and advise Contractor thereof. The latter may have to assign the machinery elsewhere to allow the Archeologists to continue their work. If such reassignment is impossible, Contractor shall be compensated from the bank of hours, or if that is exhausted, according to the agreements made during the first site meeting.

3.5 MANUAL ARCHEOLOGICAL EXCAVATIONS

.1 Given the possibility of archeological discoveries, Contractor is advised that during Work manual excavation may be required, as well as any work necessary to protect discoveries. Contractor shall be compensated according to the agreements made during the first site meeting.

3.6 PROTECTION OF REMAINS AND STRUCTURES

.1 Contractor shall take all reasonable precautions, during excavations and all other work, to protect any graves uncovered and to allow the Archeologists to examine them. Parks Canada shall not tolerate any deviation from this. If Contractor damages any remains whatsoever by negligence, Contractor shall be held responsible and the Department shall set the consequences.

END OF SECTION

Part 1 GENERAL

1.1 RELATED REQUIREMENTS

.1 Inspections and tests to be performed by Departmental Representative.

1.2 APPOINTMENT AND PAYMENT

.1 Departmental Representative to provide laboratory services for tests. Laboratory costs to be covered by Department except:

.1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.

.2 Inspection and testing performed exclusively for Contractor's convenience.

.3 Mill tests and certificates of compliance.

.4 Tests specified to be carried out by Contractor under supervision of Departmental Representative.

.2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

.1 Supply labour and facilities to:

.1 Provide access to Work for inspection and testing.

.2 Facilitate inspections and tests.

.3 Make good Work disturbed by inspection and test.

.4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.

.2 Notify Departmental Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

.3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.

.4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

Part 2 PRODUCTS

2.1 NOT USED

.1 Not used.

Part 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Schedule progress meetings throughout the progress of the work at the call of the Departmental Representative, who will administer the meetings. Meetings to be held at intervals not exceeding 2 weeks as directed by the Departmental Representative.

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

1.2 PRECONSTRUCTION MEETING

.1 Within 15 days after award of Contract, hold a meeting of parties in contract to discuss and resolve administrative procedures and responsibilities.

.2 This meeting shall be attended by the Departmental Representative, the Contractor and any other parties deemed necessary by the Departmental Representative.

.3 Establish time and location of meeting and notify parties concerned minimum 5 days before meeting.

.4 Agenda to include:

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

.2 Schedule of Work: in accordance with Section 01 32 16.07 – Construction Progress Schedules – Bar (GANTT) Chart.

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

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

.5 Site security in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

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

.7 Record drawings in accordance with Section 01 33 00 – Submittal Procedures.

.8 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 – Closeout Submittals.

.9 Monthly progress claims, administrative procedures, photographs, holdbacks.

.10 Appointment of inspection and testing agencies or firms.

.11 Insurances, transcript of policies.

1.3 PROGRESS MEETINGS

.1 Progress meetings shall be held every 2 weeks throughout the project, or more often if necessary as directed by the Departmental Representative.

.2 Agenda to include:

.1 Review, approval of minutes of previous meeting.
.2 Review of Work progress since previous meeting.
.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.
.5 Review of off-site fabrication delivery schedules.
.6 Corrective measures and procedures to regain projected schedule.
.7 Revision to construction schedule.
.8 Progress schedule, during succeeding work period.
.9 Review submittal schedules: expedite as required.
.10 Maintenance of quality standards.
.11 Review proposed changes for effect on construction schedule and on completion date.
.12 Other business.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

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

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

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

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

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

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

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

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

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative 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 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit to Departmental Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress.

1.4 PROJECT MILESTONES

.1 Project milestones form interim targets for Project Schedule.

.1 All work shall be performed and completed within fourteen (14) weeks after receipt of the notice of tender acceptance.

.2 A total period not exceeding ten (10) weeks is allowed for the Contractor to complete all work on site.

1.5 MASTER PLAN

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

.2 Departmental Representative 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 Backfill.

.7 Supplied equipment long delivery items.

1.7 PROJECT SCHEDULE REPORTING

.1 Update Project Schedule on weekly basis reflecting activity changes and completions, as well as activities in progress.

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

1.8 PROJECT MEETINGS

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

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

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

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

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

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

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

.6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.

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

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

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

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

1.2 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to CCDC 2 GC 3.11.

.2 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.

.3 Submit drawings stamped and signed by professional engineer registered or licensed in the Province of Quebec, Canada.

.4 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.

.5 Allow ten (10) days for Departmental Representative’s review of each submission.

.6 Adjustments made on shop drawings by Departmental Representative should not result in a change in the Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

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

.8 Accompany submissions with transmittal letter, in duplicate, containing:

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

.9 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor’s stamp, signed by Contractor’s authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.

.2 Layout, showing dimensions, including identified field dimensions, and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Relationship to adjacent work.

.10 After Departmental Representative's review, distribute copies.

.11 Submit six prints and one electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.

.12 Submit six electronic copies of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.

.13 Submit six electronic copies of test reports for requirements requested in specification Sections and as requested by Departmental Representative.

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

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

.14 Submit six electronic copies of certificates for requirements requested in specification Sections and as requested by Departmental Representative.

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

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

.15 Submit six electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.

.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.

.16 Submit six electronic copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.

.17 Reports on testing and verification actions taken by manufacturer's representative to confirm compliance of products, materials, equipment or systems with manufacturer's instructions.

.18 Delete information not applicable to project.

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

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

.21 The review of shop drawings by the Department is for sole purpose of ascertaining conformance with general concept.

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

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

1.3 SAMPLES

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

.2 Deliver samples prepaid to Departmental Representative’s site office.

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

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

.5 Adjustments made on samples by Departmental Representative should not result in a change in the Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.6 Make changes in samples which Departmental Representative may require, consistent with Contract Documents.

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 PROTECTION OF PUBLIC TRAFFIC

.1 Comply with requirements of Acts, Regulations and By-Laws in force for regulation of traffic or use of roadways upon or over which it is necessary to carry out Work or haul materials or equipment.

.2 Close lanes of road only after receipt of written approval from Departmental Representative.

.1 Before re-routing traffic erect suitable signs and devices to Work Area Traffic Control Manual.

.3 Provide and maintain road access and egress to property fronting along Work under Contract and in other areas as indicated, unless other means of road access exist that meet approval of Departmental Representative.

1.2 INFORMATIONAL AND WARNING DEVICES

.1 Supply and erect signs, delineators, barricades and miscellaneous warning devices to Work Area Traffic Control Manual.

.2 Place signs and other devices in locations recommended in Work Area Traffic Control Manual.

.3 Meet with Departmental Representative prior to commencement of Work to prepare list of signs and other devices required for project. If situation on site changes, revise list to approval of Departmental Representative.

.4 Continuously maintain traffic control devices in use:

.1 Check signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.

.2 Remove or cover signs which do not apply to conditions existing from day to day.

1.3 CONTROL OF PUBLIC TRAFFIC

.1 Provide competent flag personnel, trained in accordance with, and properly equipped to Work Area Traffic Control Manual for situations as follows:

.1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.

.2 Where temporary protection is required while other traffic control devices are being erected or taken down.

.3 For emergency protection when other traffic control devices are not readily available.

.4 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.

.5 Delays to public traffic due to contractor's operations: 15 minutes maximum.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

.2 Province of Quebec

.1 An Act Respecting Occupational Health and Safety, R.S.Q., c.S-2.1 (current edition) – Updated 2005.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan within 7 days after date of Notice to Proceed and prior to mobilization of workers. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

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

.3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports weekly to Departmental Representative.

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

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 02 81 01 – Hazardous Materials.

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

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

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

1.3 FILING OF NOTICE

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

.2 Contractor shall act as Lead Contractor and shall provide a written acknowledgement of this responsibility within 3 weeks of contract award. Contractor to submit written acknowledgement to CSST along with Ouverture de Chantier Notice.

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

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

1.6 GENERAL REQUIREMENTS

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

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

1.7 RESPONSIBILITY

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

.2 Contractor shall be the Principal Contractor as described in the Quebec Act Respecting Health and Safety code for the Construction for only their scope and areas of work as defined and described this project specification.

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

1.8 COMPLIANCE REQUIREMENTS

.1 Comply with R.S.Q., c. S-2.1, an Act respecting Health and Safety, and c. S-2.1, r.4 Safety Code for the Construction Industry.

1.9 UNFORESEEN HAZARDS

.1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee’s Right to Refuse Work in accordance with Acts and Regulations of the province having jurisdiction and advise Departmental Representative verbally and in writing.

.2 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, advise Health and Safety Co-ordinator and follow procedures in accordance with Acts and Regulations of the province having jurisdiction and advise Departmental Representative verbally and in writing.

1.10 HEALTH AND SAFETY CO-ORDINATOR

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

.1 Have site-related working experience specific to similar activities.

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

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

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

.5 Be on site during execution of Work.

1.11 POSTING OF DOCUMENTS

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

1.12 CORRECTION OF NON-COMPLIANCE

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

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

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

1.13 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Sections 01 74 11, 01 74 21 and 025013.

1.2 REFERENCES

.1 Definitions:

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

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction.

.2 Reference Standards:

.1 Environment Quality Act (R.S.Q., c. Q-2)

.2 Regulation respecting hazardous materials (Q-2, r. 32)

.3 Act respecting the conservation and development of wildlife (R.S.Q., c. C-61.1)

.4 Regulation respecting wildlife habitats (C-61.1, r.18)

.5 Fisheries Act (R.S.C. (1985), c. F-14)

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit required technical data sheets and manufacturer's instructions and literature on hazardous materials used at the job site. Technical data sheets must describe product characteristics, performance criteria, dimensions, limits and finish.

.2 Submit 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.

.3 Before commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by Departmental Representative.

.4 Environmental Protection Plan must include comprehensive overview of known or potential environmental issues to be addressed during construction.

.5 Address topics in Environmental Protection Plan at level of detail commensurate with environmental issues and required construction tasks.

.6 Environmental protection plan must include the following:

.1 Name[s] of person[s] responsible for overseeing compliance with the plan.

.2 Name[s] and qualifications of person[s] responsible for manifesting hazardous waste to be removed from site.

.3 Name[s] and qualifications of person[s] responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided, including monitoring and reporting requirements, to ensure that control measures are in compliance with erosion and sediment control plan and federal, provincial and municipal laws and regulations.

.6 Drawings indicating locations of proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials including methods to control runoff and to contain materials on site.

.7 Traffic control plans, including measures to safeguard archeological digs (see Section 1.9) and to reduce the erosion of temporary roadbeds from construction vehicle traffic, especially during rainy weather.

.1 Plans to include measures to minimize amount of material transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use.

.1 Plan to include measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.

.9 Spill Control Plan to include procedures, instructions and reports to be used in event of unforeseen spill of regulated substance.

.10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.

.12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

.13 Waste water management plan that identifies methods and procedures for the management and/or discharge of waste water that results directly from construction activities, such as water used to cure concrete, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in the flushing of lines.

.14 A plan for designating and protecting wetlands and historic, archeological, cultural and biological resources (see Section 1.9).

.15 Method of payment

.1 The environmental protection plan is payable in full under the corresponding items in the payment schedule. Price to include cost of

producing plan as per the preceding clauses, any required corrections and any incidental expenses.

1.4 FIRES

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

.2 Provide supervision, attendance and fire protection measures as directed.

1.5 DRAINAGE

.1 Develop and submit erosion and Sediment Control Plan (ESC) identifying type and location of erosion and sediment controls provided. Plan to include monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan and federal, provincial and municipal laws and regulations.

.2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.

.3 Provide temporary drainage and pumping required to keep excavations and site free from water.

.4 Ensure that water discharged into a watercourse, sewer system or drainage system complies with the surface-water quality criteria of the Ministry of Sustainable Development, Environment and the Fight against Climate Change (MDDELCC) (protection of aquatic life – acute effect), for suspended matter, pH and C_{10}-C_{50} before being released into the environment. Contractor to obtain authorization from the Owner or its Designated Representative before proceeding with any discharges into the environment.

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

1.6 SITE CLEARING AND PLANT PROTECTION

.1 Contractor must ensure that mature trees located in the work area are protected by establishing a buffer zone with a radius of 3 metres around any mature trees.

.2 Protect trees and shrubs adjacent to job site, storage areas and trucking lanes. Encase trees with protective wood framework from grade level to height of at least 2 m.

.3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage.

.1 Avoid unnecessary traffic, dumping and storage of materials over root zones.

.4 Minimize stripping of topsoil and vegetation.

.5 Remove trees only from the areas indicated in environmental authorizations.

.6 Removing trees from the bank of the unnamed stream and Chambly Basin is prohibited, except for work covered under the project and approved in the environmental authorizations. No tree removal is planned beyond Parks Canada property.

.7 Restoration work

.1 Work areas along the banks of the unnamed stream must be dismantled and the buffer strip along the unnamed stream restored to its natural state using native plants. No planting is to be done when the ground is frozen or between November and the end of April.

.2 If cleared surfaces cannot be seeded immediately, temporary measures must be taken to prevent soil erosion on the surface until final seeding.

.3 Method of payment

.1 Restoration of riverbank work areas with indigenous trees and shrubbery includes the supply of the plants, planting, monitoring them for effectiveness after one year and replanting if necessary, along with any incidental expenses. Restoration is payable per actual square metre involved.

.2 Temporary stabilization of the surface includes the supply of materials, installation, maintenance and removal, along with any incidental expenses. Temporary stabilization of the surface is payable per actual square metre involved, with no adjustments for overlap or any necessary one-time adjustments.

1.7 WORK ADJACENT TO WATERWAYS

.1 Remove borrow materials from waterbeds only in the areas described in the environmental authorizations.

.2 Waterways to be kept free of excavated fill, waste material and debris.

.3 Design and construct temporary crossings to minimize erosion to waterways.

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

.5 Avoid indicated spawning beds when constructing temporary crossings of waterways.

.6 No blasting is allowed in the water or on the shore of Chambly Basin or in the unnamed stream.

1.8 POLLUTION CONTROL

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

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

.3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.

.1 Provide temporary enclosures where directed by Departmental Representative.

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

1.9 HISTORICAL/ARCHAEOLOGICAL CONTROL

.1 Provide historical, archaeological, cultural resources, biological resources, and wetlands plan that defines procedures for identifying and protecting historical, archaeological

(including the Fort Chambly Cemetery), cultural resources, biological resources and wetlands known to be on project site: and identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.

.2 Plan to include methods to ensure the protection of known or newly discovered resources (including the protection of archeological digs against equipment traffic), and communications links between Contractor's staff and the Departmental Representative.

1.10 NOTIFICATION

.1 Departmental Representative will notify Contractor in writing of observed noncompliance with federal, provincial or municipal environmental laws or regulations, permits and other elements of Contractor's Environmental Protection plan.

.2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.

.1 Take action only after receipt of written approval by Departmental Representative.

.3 Where required, Departmental Representative can issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments will be allowed to Contractor for such work stoppages.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 CLEANING

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

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

.2 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

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

.4 Waste Management: sort waste as per Section 01 74 21 – Construction/demolition Waste Management and Disposal and Section 02 50 13 – Management of Toxic Waste.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility. Proof of disposal at a site approved by the Ministry of

Sustainable Development, Environment and the Fight against Climate Change (MDDELCC) must be provided to the Departmental Representative.

3.2 EQUIPMENT, VEHICLES AND MACHINERY

.1 Job-site traffic

.1 Access road limits and work areas must be clearly identified at the site. Machinery traffic must be limited to designated access roads and work areas, specifically within the diked work areas in water environments, as per the environmental authorizations.

.2 Traffic of mobile equipment and machinery on archeological digs must be avoided (see Section 1.9). Otherwise, archeological digs must be first protected from mobile equipment and machinery traffic.

.3 Fording watercourses is prohibited.

.4 Mobile equipment and machinery traffic is strictly prohibited within the 15-metre protective strip on any watercourse or water body unless it is provided for in the environmental authorizations or prior permission has been obtained from the Departmental Representative.

.5 Contractor must not leave any equipment or machinery less than 30 metres from any watercourse or water body outside of working hours or during prolonged shutdowns of the work site unless expressly provided for in the environmental authorizations or prior approval has been received from the Departmental Representative. In the latter case, measures must be in place to protect the soil beneath the equipment or machinery during the entire above-mentioned period (e.g. containment tanks with a volume equivalent to at least 110% of the fuel tank for the equipment or machinery).

.2 Machinery refuelling and maintenance

.1 Maintenance, refuelling and cleaning of machinery and equipment containing petroleum products must be done at a site that is specially equipped for that purpose, where there is no risk of contaminating the soil or underground or surface water. Such site to be located more than 60 metres from Chambly Basin and the unnamed stream. If not, the surface of such site must be impermeable and be able to contain all hydrocarbons in the event of a leak or a spill. All such activities are to take place under continuous supervision.

.2 Oil changes for any mobile equipment must not be done at the job site; oil changes may be made only on non-mobile machinery. When oil changes are being made on non-mobile equipment, the Contractor must have spill recovery equipment in place (such as a collection basin) or provide minimum protection for the soil (e.g. water-repellent absorptive mats). Used oil must be recovered, placed in barrels, identified and disposed of along with residual hazardous materials to a recycler that has been approved by the Ministry of Sustainable Development, Environment and the Fight against Climate Change (MDDELCC).

.3 Water used to wash equipment cannot be discharged directly into a watercourse, water body or onto the ground. This water must be sampled and treated (where

necessary) to meet surface water quality criteria of the MDDELCC (protection of aquatic life – acute effect) for suspended solids, pH and C_{10}-C_{50} before being discharged into the environment. Contractor to obtain authorisation from the Owner or its Designated Representative before discharging anything into the environment.

.4 Equipment used must, at all times, be in proper operating condition, clean and leak-free. Otherwise, it must be removed immediately from the job site.

.3 Hydraulic fluids

.1 Machinery used in dewatered areas of Chambly Basin and the unnamed stream must use vegetable-based or biodegradable hydraulic fluids.

3.3 RIPRAP

.1 Material used to protect the wall by riprap must meet the following specifications:

.1 must not contain more than 10% fine materials;

.2 must not have any acid-generation potential;

.3 when tested using the water-leaching analysis method, the leachate must not contain any contaminants with a concentration greater than the criteria for underground water protection (resurgence to surface water or infiltration into drains) contained in the Soil Protection and Contaminated Sites Rehabilitation Policy;

.4 must be free of anthropogenic contamination, that is have no contaminants with a concentration greater than the generic criteria for soil (Level A) of the Soil Protection and Contaminated Sites Rehabilitation Policy.

3.4 DEWATERING OF WORK AREAS

.1 Coffer-dams

.1 Three types of coffer-dam may be used to dewater work areas situated in Chambly Basin: coffer-dams built of concrete blocks with a membrane, coffer-dams of sand bags with a membrane, or coffer-dams of stone with a membrane. No earthen coffer-dams will be permitted because they would cause a major re-suspension of fine particles when being installed or dismantled in Chambly Basin.

.2 A Contractor that dewaters a work area using a coffer-dam must comply with the following requirements:

.1 coffer-dams must be designed to resist any flooding likely to occur during the work period;

.2 an impermeable membrane must be placed under the coffer-dam and on its upstream face to ensure impermeability;

.3 sandbags must be made of impermeable material in order to prevent fine particles from leaching into the water of Chambly Basin or the unnamed stream;

.4 water from the dewatering of work areas must comply with the requirements set out in Paragraph 3.5.4;

.5 the pump must be installed on a bed of coarse gravel or pebbles to avoid drawing in sediment.

.2 Diversion pipe

.1 The pipe diverting water from the unnamed stream must be of sufficient diameter to accommodate any flooding likely to occur during the work period.

.2 Further, the bed of the unnamed stream must be protected at the outflow of the culvert to prevent erosion.

3.5 **PROTECTION OF WATERCOURSES AND WATER BODIES**

.1 The Contractor may not carry out any work in Chambly Basin or the unnamed stream, as well as on their shoreline protective strips as defined in the Protection Policy for Lakeshores, Riverbanks, Littoral Zones and Floodplains, except for work described in this project and approved as part of the environmental authorizations.

.2 The free flow of water in Chambly Basin and the unnamed stream must be maintained at all times while work is being done.

.3 Control of sediment

.1 The Contractor must plan a drainage system for the work areas and take steps to provide temporary stabilization and a collection system to capture any sediment before it drains into Chambly Basin or the unnamed stream.

.2 Sediment barriers (geotextile barriers, straw-bale barriers or retention collars) must be installed at, among other locations, at the base of slopes, on the periphery of a work area, parallel to a watercourse or body of water and around any pile of loose materials.

.3 The Contractor shall use a turbidity curtain in the Chambly Basin if a stone coffer-dam and membrane are used or if the coffer-dam in place is unable to confine all the sediment that could potentially seep from the site. The turbidity curtain must meet the following specifications:

.1 vertical height must be adapted to suit the depth of the water and any potential water-level fluctuations, such that it fully rests on the bottom of Chambly Basin;

.2 be secured and ballasted at the bottom of the water such that it is able to conform to any unevenness;

.3 be solidly anchored to the shore;

.4 be clearly marked, in order to ensure boating safety.

.4 The turbidity curtain must be cleaned as necessary while work is in progress if the filtration membrane becomes clogged.

.5 Upon completion of the work, the turbidity curtain must be left in place for at least 48 hours, or until turbidity is comparable to that of the remainder of Chambly Basin. When the curtain is being removed, the Contractor must avoid re-suspending the accumulated sediment.

.6 Method of payment

.1 The sediment barrier is payable by the linear metre under the corresponding item on the payment schedule. Price to include the supply of materials, installation, maintenance, cleaning and dismantling, as well as any incidental expenses.

.2 The turbidity curtain is payable by the linear metre under the corresponding item on the payment schedule. Price to include the supply of materials, installation, inspection and maintenance, time allowed for settling prior to dismantling and dismantling, as well as any incidental expenses.

.4 Discharge of water

.1 Any water that has seen its quality affected, directly or indirectly, in whole or in part, by job site activities and any water that has been pumped out of the dewatered areas cannot be discharged directly into Chambly Basin or the unnamed stream. Such water must be confined, sampled and treated (as necessary) to comply with MDDELCC quality criteria for surface water (protection of aquatic life – acute effect) for suspended matter, pH and C_{10}-C_{50} before being released into the environment. The Contractor must obtain authorization from the Departmental Representative before discharging anything into the environment.

.5 Discharge into water bodies and water courses

.1 The Contractor must implement measures to prevent discharges of goods or materials (such as rubbish, construction debris, residual matter, or hazardous goods) into Chambly Basin or the unnamed stream.

.2 Should this occur, any materials or products must be extracted immediately from Chambly Basin and the unnamed stream in order to keep these waterways clean and free from contamination.

.6 Disposal of unwanted snow

.1 Snow cleared from the work areas must be disposed of by the Contractor in an area designated for that purpose and authorized by the MDDELCC, with the agreement of the Departmental Representative. No snow may be disposed of in the unnamed stream or Chambly Basin.

3.6 **PROTECTION OF WILDLIFE**

.1 The Contractor must comply with the requirements of the Environment Quality Act (R.S.Q., c. Q-2), the Act respecting the Conservation and development of Wildlife

(R.S.Q., c. C-61.1) and the Fisheries Act (R.S.C. (1985), c. F-14), and also comply with the requirements associated with each of the environmental authorizations affecting wildlife habitats and species requiring protection.

.2 Restriction period

.1 Work in Chambly Basin and the unnamed stream is prohibited between April 1 and July 31.

.3 Dewatering of work areas

.1 The Contractor must prevent the confinement of fish within the boundaries of the dewatered work areas after coffer-dams have been put into place by relocating them immediately to Chambly Basin or the unnamed stream.

.4 Withdrawal of water from Chambly Basin

.1 Drawing water from Chambly Basin is authorized exclusively for purposes of pressure washing the Fort Chambly southwest retaining wall.

.2 The Contractor must comply with the provisions governing the pumping of water from fish habitat described in the Regulation respecting wildlife Habitats (C-61.1, reg. 18). It must inform the Departmental Representative at least 16 days prior to the date on which pumping from Chambly Basin is to begin.

.3 The Contractor must arrange the withdrawal of water from Chambly Basin in accordance with Fisheries and Oceans Canada requirements, that is, install a screen to prevent fish from being entrapped. Design and installation of the fish screens at the entrances to fresh water intakes are described on the Fisheries and Oceans Canada Web site.

.4 The Contractor must limit as much as possible the daily volume of water pumped from Chambly Basin.

.5 Method of payment

.1 Fish screening is payable on a per-unit basis under the corresponding item on the schedule. Price includes the supply of materials, installation, maintenance, dismantling and any other incidental expenses.

3.7 PROTECTION OF AIR QUALITY

.1 No particulate or dust emissions will be tolerated at the job site beyond the standards set out in the Clean Air Regulation (Q-2, r. 4.1), that is, dust visible more than 2 metres from the source.

.2 The Contractor is required to:

.1 avoid idling any vehicle, equipment or machinery when they are not being used;

.2 immediately repair any equipment or machine that produces excessive exhaust emissions;

.3 maintain equipment anti-pollution systems in proper running order.

3.8 NOISE PROTECTION

.1 The Contractor must control sound levels from the job site by applying the following measures:

.1 machinery, equipment and any vehicles must be equipped with functioning mufflers at all times;

.2 banging of dump truck tailgates must be avoided at all times;

.3 give preference to the use of equipment that generates low noise levels.

3.9 **MANAGEMENT OF HYDROCARBONS AND HAZARDOUS MATERIALS**

.1 Petroleum products and any other hazardous materials must be stored more than 60 metres from Chambly Basin and the unnamed stream. These products and goods must be stored in dedicated areas that are protected against impact and sheltered from inclement weather. Hazardous materials must be stored in accordance with the provisions of the Regulation respecting hazardous materials (Q-2, r. 32).

.2 Stationary machinery and equipment (such as generators and compressors) located on the shore or in dewatered work areas of Chambly Basin and the unnamed stream must be equipped with collection basins to catch any leaks or spills (volume equivalent to at least 110% of the volume of the fuel tank of the equipment or machinery). These basins to be kept operational at all times.

.3 The Contractor must supply the Departmental Representative with the technical specifications for the products it intends to use, at least 48 hours before it arrives at the job site.

.4 New hazardous materials must not be discarded. When work is concluded, the Contractor must take back its unused hazardous materials and leave the job site completely clean.

3.10 SPILLS MANAGEMENT

.1 In the event of an environmental incident, the Contractor must immediately inform the Departmental Representative and comply with the following rules:

.1 Stop any leak

.2 Confine the product that was spilled

.3 Collect the contaminants and contaminated materials

.4 Prepare a detailed incident report that includes:

.1 Description and location of the accident

.2 Product spilled and quantity

.3 Date/time of the event

.4 Individual who detected the accident and telephone number

.2 In the event of a spill, the Contractor is responsible for immediately informing the authorities (Urgence-Environnement and Environment Canada) as soon as it learns of the event.

.3 The Contractor is responsible for defraying all costs relating to the decontamination and disposition of any soil that becomes contaminated as the result of a spill or leak of a contaminant stemming directly or indirectly from its operations. The Contractor must dispose of the contaminated materials at an MDDELCC-approved site. Evidence of disposal must be given to the Departmental Representative.

.4 Contaminated soil must not be mixed with clean soil or with less contaminated soil or materials in order to dispose of it more easily.

.5 The Contractor must permanently position a sufficient number of emergency petroleum product recovery kits at the site. Kits to include sufficient absorbent material to allow for rapid and effective intervention, both on water and on land. These kits must be easily accessible at all times to allow for rapid response. Workers who could potentially need to use these kits must be given the appropriate training.

.6 Method of payment:

.1 The emergency kit is payable on a unit basis under the corresponding item on the schedule. Price to include installation, removal and any incidental expenses.

3.11 MANAGEMENT OF EXCAVATED MATERIAL

.1 Excavated material used in carrying out the work must be free of anthropogenic contamination (Criterion A from the Policy on Soil Protection and Rehabilitation of Contaminated Sites).

.2 Excavated material (sediment, stones, soil) must be segregated, based on the nature of the material, with a view to its potential re-use at the site.

.3 Surplus excavated material that will not be re-used on the site must be categorized and disposed of in accordance with applicable regulations. When necessary, written proof of their acceptance (transport manifest or other document specifying the nature and quantity of material) at an MDDELCC-authorized location must be given to the Departmental Representative.

.4 Piles of fine materials must be covered to limit wind erosion or surface runoff. Sediment barriers must be installed around any piles of fine materials.

.5 During excavation operations, the Contractor must immediately report the discovery of any site contamination (visual signs or odour) to the Designated Representative before continuing with the work.

.6 Soil may be stored in leak-proof drums or stored temporarily on a waterproof sheet and covered with another waterproof sheet until the soil has been categorized.

3.12 TREE REMOVAL

.1 Areas to be cleared of trees must be marked off before the work of felling begins.

.2 Tree removal must be limited to those areas that are needed in order to carry out the work.

.3 Removal of any trees beyond Parks Canada property and the areas covered by environmental permitting is prohibited.

.4 During clearing operations, avoid the felling of any trees toward a watercourse or toward the outside of the clearance limits.

.5 Any remaining residue from tree removal operations must be disposed of in accordance with applicable regulations at an MDDELCC-approved location. Evidence of disposal must be supplied to the Departmental Representative.

.6 The burning of woody debris at the job site is prohibited.

3.13 TEMPORARY SANITARY FACILITIES

.1 The Contractor must supply and maintain at the Job site temporary sanitary facilities required for use by persons accessing the site and must remove them once all work has been completed.

.2 Wastewater from temporary sanitary facilities must be disposed of in accordance with applicable regulations at an MDDELCC-approved site. Evidence of disposal must be given to the Departmental Representative.

3.14 CONTRACTOR'S OBLIGATIONS

.1 The Owner holds environmental authorizations for the planned work. The Contractor must comply with the requirements of the conditions associated with each environmental authorization.

.2 Work must be completed to the satisfaction of the Owner or its Designated Representative with respect to environmental protection standards and regulations. The Contractor is required to follow the environmental directives contained in these specifications and make allowance for the costs inherent in such requirements.

.3 The Contractor must ensure that its work complies with:

.1 the laws and regulations set by municipal, provincial and federal environmental authorities;

.2 the requirements set out in these specifications;

.3 the requirements of conditions associated with each of the environmental authorizations;

.4 any other standards or guidelines that may be established by the Departmental Representative.

.4 In the event that work not covered by the pre-existing environmental authorizations is required by the Contractor, the Contractor, in addition to informing the Departmental Representative and receiving authorization therefor, must obtain any permits and authorizations from the appropriate agencies required to carry out its work. Any costs or

delays related to compliance with and application of environmental requirements must be fully planned for and assumed by the Contractor.

3.15 METHOD OF PAYMENT

.1 Environmental protective work is payable under the method of payment described in these specifications.

.2 The Contractor must allocate the cost of work to ensure protection of the environment that is not covered under any specific item in the schedule in the unit or overall prices for the corresponding work.

END OF SECTION

Part 1 General

1.1 EXAMINATION

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

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

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

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

1.2 TESTING AND INSPECTION AGENCIES

.1 The Departmental Representative will arrange for tests and inspections to be done at the Department’s expense.

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

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

.4 If defects are revealed during inspection and/or testing, the Department will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as directed by Departmental Representative at no cost, and pay costs for retesting and reinspection.

1.3 ACCESS TO WORK

.1 Allow access to the site for parties performing tests and inspections.

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

1.4 PROCEDURES

.1 Notify Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made by all concerned.

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

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

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

1.6 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

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

1.7 MOCK-UPS

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

.2 Prepare mock-ups for Departmental Representative's review with reasonable promptness and in orderly sequence, so as to not cause delays in Work.

.3 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.

.4 If requested, Departmental Representative will assist in preparing schedule fixing dates for preparation.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 The office of the Departmental Representative and the field laboratory are paid for on a lump-sum basis.

.2 Maintaining traffic and signage pertaining to the work are paid for on a lump-sum basis.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CSA-0121-FM1978(C2003), Douglas Fir Plywood.

.3 CAN/CSA-S269.2-FM1987(C2003), Access Scaffolding for Construction Purposes.

.4 CAN/CSA-Z321-96(C2001), Signs and Symbols for the Occupational Environment.

1.3 INSTALLATION AND REMOVAL

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

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

.3 Indicate use of supplemental or other staging area.

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

.5 Remove from site all such work after use.

.6 No lifting equipment, materials, vehicles or heavy loads shall be stored on the ground behind the wall unless they are stored at a distance equivalent to the height of the ground supported by the wall, at a minimum.

1.4 SCAFFOLDING

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

.2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs required to perform the Work.

1.5 HOISTING

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

.2 Hoists and cranes to be operated by qualified operator.

1.6 SITE STORAGE/LOADING

.1 Refer to subsection GC 3.12 in General Conditions set out in CCDC 2.

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

.3 Do not load or permit to load any part of Work with weight or force that will endanger Work. No loads shall be placed on the ground behind the wall unless they are at a distance equivalent to the height of the ground supported by the wall, at a minimum. Furthermore, the Contractor’s working methods shall not place any lateral (horizontal) loads on walls.

1.7 CONSTRUCTION PARKING

.1 Parking will not be permitted on site.

.2 Provide and maintain adequate access to project site.

1.8 SECURITY

.1 Provide and pay for responsible security personnel to guard site and contents of site after working hours and during holidays.

1.9 OFFICES

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

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

.3 Departmental Representative’s Site office.

.1 Provide temporary office for Departmental Representative.

.2 Inside dimensions minimum 3.6 m long x 3 m wide x 2.4 m high, with floor 0.3 m above grade, complete with four 50% opening windows and one lockable door.

.3 Insulate building and provide heating system to maintain 22 degrees C inside temperature at -20 degrees C outside temperature.

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

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

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

.7 Equip office with 1 m x 2 m table, four chairs, 6 m of shelving 300 mm wide, one 3 drawer filing cabinet, one plan rack, and one coat rack and shelf.

.8 Maintain in clean condition.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.11 SANITARY FACILITIES

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

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

1.12 CONSTRUCTION SIGNAGE

.1 Provide and erect project sign, within three weeks of signing Contract, in a location designated by Departmental Representative.

.2 Construction sign 1.2 m x 1.2 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on sign, name of Owner and Contractor, of design style established by Departmental Representative.

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

.5 Direct requests for approval to erect Consultant/Contractor signboard to Departmental Representative. For consideration general appearance of this signboard must conform to project identification site sign and wording must be in both official languages.

.6 Signs and notices for safety and instruction in both official languages. Graphic symbols to CAN/CSA-Z321.

.7 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.13 PROTECTION AND MAINTENANCE OF TRAFFIC

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

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

.3 Site users shall have continued, safe pedestrian access to the Fort throughout the duration of the work.

.4 Construct access and haul roads necessary.

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

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

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

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

.9 Specific temporary access roads must be respected for movement of machinery and equipment on the site. There are archaeological soils in the south part of the wall (monument area) and these must be protected during the work. Access roads shall be submitted to the Departmental Representative for approval before work commences.

.10 Provide snow removal during period of Work.

.11 Remove, upon completion of work, haul roads designated by Departmental Representative.

1.14 CLEAN-UP

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

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

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian General Standards Board (CGSB)

.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.

.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.

.2 Canadian Standards Association (CSA International)

.1 CSA-O121-M1978(C2003), Douglas Fir Plywood.

.3 Public Works and Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R2002D, Title: General Conditions ‘C’, in effect as of May 14, 2004.

1.2 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel T-bar fence posts spaced at 2.4 m on centre. Provide at least one lockable access barrier for trucks.

.2 Maintain fence in good repair. Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.

1.4 ACCESS TO SITE

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

1.5 PUBLIC TRAFFIC FLOW

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

1.6 FIRE ROUTES

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

1.7 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.8 WASTE MANAGEMENT AND DISPOSAL

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-94, Stipulated Price Contract.

.2 Conform to these reference standards, in whole or in part as specifically requested in specifications.

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

.4 Cost for such testing will be borne by Contractor in event of non-conformance with Contract Documents.

1.2 QUALITY

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

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

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

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

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

1.3 AVAILABILITY

.1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

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

1.4 STORAGE, HANDLING AND PROTECTION

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

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

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

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

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

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

.7 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

.8 Touch up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 TRANSPORTATION

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

1.6 MANUFACTURER'S INSTRUCTIONS

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

.2 Notify Departmental Representative in writing of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.

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

1.7 QUALITY OF WORK

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

.2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves the right to require dismissal from site workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work and worker competence in cases of dispute rest solely with Departmental Representative, whose decision is final.

1.8 COORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.9 REMEDIAL WORK

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 MATERIALS

.1 Required for original installation.

.2 Change in Materials: Submit request for substitution in accordance with Section 01 33 00 – Submittal Procedures.

1.3 PREPARATION

.1 Inspect existing conditions, including elements subject to damage or movement during cutting and patching.

.2 After uncovering, inspect conditions affecting performance of Work.

.3 Beginning excavation or partial demolition means acceptance of existing conditions.

.4 Supply and install supports to assure structural integrity of surroundings. Provide devices and methods to protect other portions of project from damage.

.5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

.1 Execute partial demolition, as well as excavation and filling, to complete Work.

.2 Fit several parts together, to integrate with other Work.

.3 Execute Work by methods that avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.

.4 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

.5 Restore work with new products in accordance with requirements of Contract Documents.

.6 Refinish surfaces to match adjacent finishes. Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Sections 01 35 43, 01 74 21 and 02 50 13.

1.2 REFERENCES

.1 *Environment Quality Act* (CQLR, c Q-2)

.2 Regulation Respecting Hazardous Materials (Q-2, r 32)

.3 Regulation Respecting the Landfilling and Incineration of Residual Materials (Q-2, r 19)

1.3 PROJECT CLEANLINESS

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

.2 Remove debris and waste products from worksite regularly to keep it free from garbage, hazardous waste (HW), waste products, material, substances or equipment not needed for carrying out Work and dispose of them in compliance with the regulations in effect. Proof of disposal in a place authorized by the Department of Sustainable Development, the Environment and the Fight Against Climate Change (MDDELCC) shall be provided to the Departmental Representative.

.3 Do not burn waste materials on site.

.4 Throwing any material, waste, HW, debris or residue into the Chambly basin or the unnamed stream is strictly prohibited. Should it occur, the material shall be recovered immediately.

.5 Clear snow and ice from access roads. Contractor shall dispose of snow removed from work areas in a designated site authorized by MDDELCC, in agreement with the Departmental Representative. No waste snow shall be disposed of in the unnamed stream or the Chambly basin.

.6 Keep public roads around the worksite free from material, waste, HW, debris, residue, or scrap from the worksite, and clean the public roads immediately should any such material be found thereon.

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

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

.9 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.10 Dispose of waste materials and debris off site.

.11 Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.

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

.13 Provide adequate ventilation during use of volatile or noxious substances.

.14 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.

.15 Water Used for Washing Concrete Mixers

.1 Excess concrete and cement from concrete mixers shall be poured into molds or some other type of leakproof container. Concrete residue shall be managed with construction waste.

.2 Water used for washing concrete mixers shall be collected in a leakproof pond so as to prevent any run-off into the environment. The cleaning area shall be located over 30 m from the Chambly basin and the unnamed stream.

.3 Water used for washing shall not be released directly into a watercourse or body of water or on the ground. Water used for washing may be collected by the concrete supplier and returned to the concrete plant for disposal. Otherwise, this water shall be confined, sampled and treated (if necessary) in order to meet MDDELCC's surface water quality criteria (protection of aquatic life – acute effects) for suspended material, pH and C_{10}-C_{50}, before release into the environment. Contractor shall obtain authorization from Owner or Owner's designated Representative before any release into the environment.

1.4 FINAL CLEANING

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

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

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

.4 Remove waste products from the site and dispose of them in compliance with the regulations in effect. Do not burn waste materials on site. Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris. Proof of disposal in a place authorized by MDDELCC shall be provided to the Departmental Representative.

.5 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

.6 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls and floors.

.7 Clean lighting reflectors, lenses, and other lighting surfaces.

.8 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.

.9 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.

.10 Remove dirt and other disfiguration from exterior surfaces.

.11 Sweep and wash clean paved areas.

.12 Clean roofs, downspouts, and drainage systems.

.13 Remove snow and ice from access to building.

.14 Contractor shall recover all hazardous waste (HW) produced during the Work. All HW shall be sorted and managed in compliance with the regulations in effect, more particularly the Regulation Respecting Hazardous Materials (Q-2, r. 32).

.15 Contractor shall dispose of the HW in a site duly authorized by the MDDELCC. Proof of disposal shall be provided to Departmental Representative.

.16 Contractor shall recover all residual material produced during the Work (waste, recyclables, construction debris, etc.). All residual material shall be sorted and managed in compliance with the regulations in effect.

.17 Contractor shall dispose of the residual material in a site duly authorized by MDDELCC. Proof of disposal shall be provided to Departmental Representative.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 21 – Construction/Demolition Waste Management and Disposal, and Section 02 50 13 – Management of Toxic Waste.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 WASTE MANAGEMENT GOALS

.1 Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.

.2 PWGSC's waste management goal: to divert as much as possible of total Project Waste from landfill sites. Prior to project completion provide Departmental Representative with documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.

.3 Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.

.4 Protect environment and prevent environmental pollution damage.

1.2 RELATED REQUIREMENTS

.1 Sections 01 35 43, 01 74 11 and 02 50 13.

1.3 REFERENCES

.1 Definitions:

.1 Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.

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

.3 Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste generated during construction, demolition, and/or renovation activities

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

.5 Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.

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

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

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

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

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

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

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

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

.12 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.

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

.14 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.

.15 Waste Management Co-ordinator (WMC): contractor representative responsible for supervising waste management activities as well as co-ordinating required submittal and reporting requirements.

.16 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan information acquired from Waste Audit.

.2 Reference Standards:

.1 Environment Quality Act (RSQ, c. Q-2)

.2 Regulation Respecting Hazardous Materials (Q-2, r. 32)

.3 Regulation Regarding the Landfilling and Incineration of Residual Materials (Q-2, r. 19)

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Prepare and submit at intervals agreed to by Departmental Representative the following:

.1 Receipts, scale tickets, waybills and/or receipts for disposal of waste materials generated during the work (hazardous waste, waste, recyclable materials, construction debris, etc.) indicating the quantities and types of materials reused/repurposed, recycled or disposed of.

.2 Submit prior to final payment the following:

.1 Provide the receipts, scale tickets, waybills and receipts for disposal of waste materials generated during the work (hazardous waste, waste, recyclable materials, construction debris, etc.) that confirm the quantities and types of materials reused/repurposed, recycled and disposed of, as well as their destination.

1.5 USE OF SITE AND FACILITIES

.1 Execute Work with minimal interference and disturbance to normal use of premises.

.2 Maintain security measures established by facility. Provide temporary security measures approved by Departmental Representative.

1.6 WASTE PROCESSING SITES

.1 Contractor is responsible to research and locate waste diversion resources and service providers. Salvaged materials are to be transported off site to approved and/or authorized recycling facilities or to users of material for recycling.

1.7 STORAGE, HANDLING AND PROTECTION

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

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

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

.4 Hazardous waste (HW) must be stored more than 60 metres from Chambly Basin and the unnamed stream. All HW must be separated and managed in accordance with regulations in effect, specifically, the Regulation Respecting Hazardous Materials (Q-2, r. 32).

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

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

.7 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.

.8 Protect surface drainage, mechanical and electrical from damage and blockage.

.9 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.

.10 Separate and store materials produced during project in designated areas.

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

.1 On-site source separation is recommended.

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

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

.4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

1.8 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

.2 Do not dispose of materials, waste, hazardous waste, debris or residue into waterways, storm, or sanitary sewers.

.3 Keep records of construction waste including:

.1 Number and size of bins.

.2 Waste type of each bin.

.3 Total tonnage generated.

.4 Tonnage reused or recycled.

.5 Reused or recycled waste destination.

.4 Remove materials on-site as Work progresses.

.5 Contractor is responsible for collecting all HW generated during the work. All HW must be separated and managed in accordance with regulations in effect, specifically, the Regulation Respecting Hazardous Materials (Q-2, r. 32).

.6 Contractor shall dispose of its HW at a disposal site approved by the MDDELCC. Proof of disposal shall be provided to the Departmental Representative.

.7 Contractor shall collect all waste materials generated during the work (waste, recyclable materials, construction waste, etc.). All waste materials shall be separated and managed in accordance with the regulations in effect.

.8 Contractor must dispose of its waste materials at a disposal site approved by the MDDELCC. Proof of disposal shall be provided to the Departmental Representative.

1.9 SCHEDULING

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 APPLICATION

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

3.2 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning and Section 02 50 13 – Management of Toxic Waste.

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 – Cleaning and and Section 02 50 13 – Management of Toxic Waste.

.3 Waste Management: separate waste materials for reuse and recycling or disposal.

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

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

3.3 DIVERSION OF MATERIALS

.1 Separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative and consistent with applicable fire regulations.

.1 Mark containers or stockpile areas.

.2 Provide instruction on disposal practices.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

.1 Departmental Representative's inspection:

.1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.2 Completion Tasks: submit written certificates in English and French that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Work: complete and ready for final inspection.

.3 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by Departmental Representative and Contractor.

.2 If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

.4 Declaration of Substantial Performance: when Departmental Representative considers deficiencies and defects corrected and requirements of Contract substantially performed, make application for Certificate of Substantial Performance.

.5 Commencement of Lien and Warranty Periods: date of Owner's acceptance of submitted declaration of Substantial Performance to be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.

.6 Final Payment:

.1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.7 Payment of Holdback: after issuance of Certificate of Substantial Performance of Work, submit application for payment of holdback amount in accordance with contractual agreement.

1.2 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 ACTION AND INFORMATIONAL SUBMITTALS

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

1.2 CONTENTS - PROJECT RECORD DOCUMENTS

.1 Table of Contents for Each Volume: provide title of project;

- .1 Date of submission; names.
- .2 Names, addresses and telephone numbers of Consultant and Contractor with names of responsible parties.
- .3 Schedule of products and systems, indexed to content of volume.

.2 For each product or system:

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

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

.4 Drawings: supplement product data.

1.3 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of opaque drawings and in copy of specifications.

.2 Use felt tip marking pens.

.3 Record information concurrently with construction progress.

- .1 Do not conceal Work until required information is recorded.

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

- .1 Measured depths of elements of foundation in relation to grade.
- .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
- .3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.
- .7 References to related shop drawings and modifications.

.5 Specifications: 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 Provide digital photos, if requested, for site records.

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

EXISTING CONDITIONS

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Work in this Section will be measured by Departmental Representative and paid for as described below.

.1 Demolition of the coping will be measured in linear metres following the wall centreline. This work includes saw cuts, installation, disposal of materials and any incidental expense.

.2 Demolition of the unsound concrete downstream of the wall (corrective work on the erosion at the wall footing) will not be measured for payment; these costs must be included in the other item prices pertaining to this work.

.3 Demolition of the unsound concrete downstream of the wall and repair with extra concrete cover on the wall will not be measured for payment; these costs must be included in the other item prices related to this work.

1.2 REFERENCES

.1 Definitions:

.1 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, include but not limited to: poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or materials that endanger human health or environment if handled improperly.

.2 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA)

.1 CCME PN 1326-2008, Environmental Code of Practice for Aboveground and Underground Storage Tank Systems for Petroleum Products and Allied Petroleum Products.

.2 CSA International

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

.3 Department of Justice Canada (Jus)

.1 Canadian Environmental Assessment Act (CEAA), c. 37, 1995.

.2 Canadian Environmental Protection Act (CEPA), 1999, c. 33.

.1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations.

.2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations.

.3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34.

1.3 EXISTING CONDITIONS

.1 Should material resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of demolition, stop work, take preventative measures, and notify Departmental Representative immediately. Proceed only after receipt of written instructions have been received from Departmental Representative.

Part 2 Execution

2.1 PREPARATION

.1 Temporary Erosion and Sedimentation Control:

.1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

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

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

.2 Protection of in-place conditions:

.1 Take the necessary measures to prevent breakage of structures, adjacent elements and other structures at or near the site.

.1 Repair damage caused by demolition as directed by Departmental Representative.

.2 Support affected structures. If safety of structure being demolished or adjacent structures appears to be endangered, take preventative measures, stop Work and immediately notify Departmental Representative.

2.2 DEMOLITION

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

.2 Surfaces for demolition are indicated on the plans and are designated onsite by the Departmental Representative.

.3 Designate the areas to be demolished by a saw cut 10 mm deep perpendicular to the surface on all surfaces. Saw cuts must not cross each other.

.4 Demolish to minimize dusting. Keep materials wetted as directed by Departmental Representative.

.5 Remove and dispose of demolished materials except where noted otherwise and in accordance with authorities having jurisdiction.

.6 Corrective work on the wall footing as well as repair with extra concrete cover of a section approximately 11 m²: demolish delaminated concrete using pressure wash (15 MPa, 20 L/minute, concentrated circular jet nozzle, nozzle-to-surface distance of 150 mm to 200 mm). Roughen sound concrete to a minimum depth of 10 mm.

.7 The coping concrete (section approximately 189 m and section for drain downpipes) must be demolished using a 7-kg manual air hammer. With the approval of the Departmental Representative, once the demolition has begun, a 15-kg manual air hammer may be used on certain sections slated for demolition providing it does not damage the structures. In all cases where the work could potentially damage portions of the elements to be retained, the work shall be interrupted and the demolition method or equipment must be reviewed to prevent any breakage.

2.3 CLEANING

.1 Remove surplus or waste materials as the work progresses in order to avoid cluttering the site. Surplus materials must be disposed of in accordance with applicable standards and legislation.

.2 Storage of excavated, demolition or waste materials within a distance equal to or less than twice the height of the wall behind the material is prohibited at all times.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Sections 01 35 43, 01 74 11 and 01 74 21.

1.2 REFERENCES

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

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

.1 Material Safety Data Sheets (MSDS).

.3 National Fire Code of Canada, 2005.

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

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

.6 Ozone-Depleting Substances Regulations, SOR/99-07.

.7 Environmental Code of Practice on Halons, July 1996.

.8 Environmental Code of Practice for Elimination of Fluorocarbon Emissions from Refrigeration and Air Conditioning Systems, March 1996.

.9 Environment Quality Act (LRQ, c. Q-2), Regulation Respecting Hazardous Materials (c. Q-2, r. 23)

1.3 DEFINITIONS

.1 Toxic: substance is considered toxic if it is listed on Toxic Substances List found in Schedule 1 of CEPA.

.2 List of Toxic Substances: found in Schedule 1 of CEPA, lists substances that have been assessed as toxic. Federal Government can make regulations with respect to a substance specified in List of Toxic Substances. Column II of this list identifies type of regulation applicable to each substance.

.3 PCBs: includes chlorobiphenyls referred to in Column I of item 1 of the List of Toxic Substances in Schedule I of Canadian Environmental Protection Act.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 01 35 29 06 – Health and Safety.

.2 Submit photocopy of shipping documents to Departmental Representative when shipping toxic or hazardous wastes off site.

1.5 DELIVERY, STORAGE, AND HANDLING

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

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

.3 Coordinate storage of toxic wastes with Departmental Representative and follow local requirements for labelling and storage of wastes.

.4 Keep quantities to minimum. Smoking is prohibited in areas where toxic wastes are stored, used, or handled.

.5 Only certified persons who have successfully completed Environment Canada Environmental Awareness Course for Environmentally Safe Handling of Refrigerants are permitted to work on refrigeration and air conditioning systems.

.6 Report spills or accidents involving toxic wastes immediately to Departmental Representative and to appropriate regulatory authorities. Take reasonable measures to contain the release while ensuring health and safety is protected.

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

.8 Use authorized/licensed carrier to transport toxic waste.

.9 Coordinate transportation and disposal of toxic wastes and hazardous waste materials with the Departmental Representative.

.10 Notify appropriate regulatory authorities and obtain required permits and approvals prior to exporting toxic or hazardous wastes.

.11 Dispose of toxic and hazardous wastes generated on site in accordance with applicable federal and provincial acts, regulations, and guidelines.

.12 Ensure toxic and hazardous wastes are shipped to authorized/licensed treatment or disposal facility. Ensure that liability insurance requirements are met. Submit proof of disposal to Departmental Representative.

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Definitions:

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

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

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

.2 Reference Standards:

.1 Canadian Environmental Protection Act (CEPA), 1999

.1 Export and Import of Hazardous Waste and Hazardous Recyclable Material Regulations (SOR/2005-149).

.2 Department of Justice Canada (Jus)

.1 Transportation of Dangerous Goods Act (TDG Act), 1992, (c. 34).

.2 Transportation of Dangerous Goods Regulations (T-19.01-SOR/2001-286).

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

.1 Material Safety Data Sheets (MSDS).

1.2 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for hazardous materials. Include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29 06 – Health and Safety Requirements to Departmental Representative for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to Departmental Representative that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with manufacturer's written instructions and Section 01 61 00 – Common Product Requirements.

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

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

.4 Storage and Handling Requirements:

.1 Coordinate storage of hazardous materials with Departmental Representative and abide by local requirements for labelling and storage of materials and wastes.

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

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

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use, provided that the following conditions are met.

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

.2 Storage of quantities of flammable and combustible liquids exceeding 45 litres requires the approval of the Departmental Representative.

.5 Transfer flammable and combustible liquids away from open flames or heat-producing devices.

.6 Solvents or cleaning agents must be non-flammable or have flash point above 38 degrees C.

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

.8 Keep quantities to minimum. Smoking is prohibited in areas where hazardous materials are stored, used, or handled.

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

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

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

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

.4 Segregate incompatible materials and wastes.

.5 Ensure that different hazardous materials or hazardous wastes are stored in separate containers.

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

.7 Maintain clear egress from storage area.

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

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

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

.11 When hazardous waste is generated on site:

.1 Coordinate transportation and disposal with Departmental Representative.

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

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

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

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

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

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

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

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

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

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

Part 2 Products

2.1 MATERIALS

.1 Description:

.1 Bring on site only quantities of hazardous material required to perform Work.

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

Part 3 Execution

3.1 CLEANING

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

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

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

END OF SECTION

CONCRETE

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 The supply and installation of concrete forming and accessories and concrete curing are not measured for payment purposes and will be considered as an integral part of the work.

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

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

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

.3 CAN/CSA-S269.3-FM92(R2003), Concrete Formwork, National Standard of Canada

1.3 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit shop drawings for formwork and falsework.

.1 The drawings must be signed and sealed by a member of the Ordre des Ingénieurs du Québec.

.2 Submit WHMIS MSDS – Material Safety Data Sheets in accordance with Section 02 81 01 – Hazardous Materials.

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

.4 Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

.5 Indicate sequence of erection and removal of formwork/falsework as directed by Departmental Representative.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Waste Management and Disposal:

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

.2 Divert wood materials from landfill to a recycling facility approved by Departmental Representative.

.3 Divert unused form release material from landfill to an official hazardous material collections site approved by the Departmental Representative.

Part 2 Products

2.1 MATERIALS

.1 Formwork materials:

.1 For concreting, use formwork materials to CSA-A23.1/A23.2.

.2 Form ties:

.1 Use snap ties complete with plastic cones and light grey concrete plugs.

.3 Form release agent: non-toxic and biodegradable.

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

.5 Formliners for repairs with extra wall thickness: Dayton Superior Colonial Dry Stack or equivalent.

Part 3 Execution

3.1 FABRICATION AND ERECTION

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

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

.3 Before pouring concrete directly on rock, clean surfaces to remove all loose debris and install a concrete support base to equalize the bottom of the bedrock.

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

.5 Refer to architectural drawings for concrete members requiring architectural exposed finishes.

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

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

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

.9 Align form joints and make watertight.

.1 Keep form joints to minimum.

.10 Use 25 mm chamfer strips on external corners and/or 25 mm fillets at interior corners, joints, unless specified otherwise.

.11 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

.12 Construct forms for architectural concrete, and place ties as indicated.

.1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.

.13 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.

.14 Line forms for following surfaces:

.1 All coping surfaces.

.2 Secure lining taut to formwork to prevent folds.

.3 Pull down lining over edges of formwork panels.

.4 Ensure lining is new and not reused material.

.5 Ensure lining is dry and free of oil when concrete is poured.

.6 Application of form release agents on formwork surface is prohibited where drainage lining is used.

.7 If concrete surfaces require cleaning after form removal, use only pressurized water stream so as not to alter concrete's smooth finish.

.8 Cost of textile lining is included in price of concrete for corresponding portion of Work.

.15 Install a formliner on the repair with extra thickness on the visible face of the retaining wall. The formliner must be installed so that the repair looks similar to the masonry on both sides. The contractor may propose an equivalent product or method for approval. Where necessary, the Departmental Representative may require a sample before work is done.

.16 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

3.2 REMOVAL AND RESHORING

.1 Leave formwork in place for following minimum periods of time after placing concrete.

.1 Three days.

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

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

END OF SECTION

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Measure reinforcing steel in kilograms of steel incorporated into Work, computed from theoretical unit mass specified in CSA-G30.18 for lengths and sizes of bars as indicated or authorized in writing by Departmental Representative. The per-kg price indicated in the price schedule includes supply, galvanization if required, attachment of reinforcing elements, placement and all incidental expenses.

.2 Measure anchors based on the number of units incorporated in the Work, as indicated or approved in writing by the Departmental Representative, except reinforcement included in 1.1.1 above. The price includes boring holes, the anchoring product, placement, testing and all incidental expenses.

.3 No measurement will be made under this Section.

1.2 REFERENCES

.1 ASTM International

.1 ASTM A82/A82M-07, Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.

.2 ASTM A143/A143M-07, Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.

.2 CSA International

.1 CSA-A23.1-09/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A23.3-04(R2010), Design of Concrete Structures.

.3 CSA-G30.18-09, Carbon Steel Bars for Concrete Reinforcement.

.4 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.5 CAN/CSA-G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.

.3 Reinforcing Steel Institute of Canada (RSIC)

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the relevant province of Canada.

.1 Indicate placing of reinforcement and:

.1 Bar bending details.

.2 Lists.

.3 Quantities of reinforcement.

.4 Sizes, spacings, locations of reinforcement and mechanical splices if approved by Departmental Representative. Steel reinforcement shown must have identifying code marks to permit correct placement without reference to structural drawings.

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

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

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Substitute different size bars only if permitted in writing by Departmental Representative.

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

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

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

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

.6 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164, minimum zinc coating 610 g/m^2.

.1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.

.2 If chromate treatment is carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.

.1 Temperature of solution equal to or greater than 32 degrees and galvanized steels immersed for minimum 20 seconds.

.3 If galvanized steels are at ambient temperature, add sulphuric acid as bonding agent. Use sulphuric acid at concentration of 0.5% to 1%.

.1 In this case, no restriction applies to temperature of solution.

.4 Chromate solution sold for this purpose may replace solution described above, provided it is of equivalent effectiveness.

.1 Provide product description as described in PART 1 – ACTION AND INFORMATIONAL SUBMITTALS.

.7 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.

.8 Plain round bars: to CSA-G40.20/G40.21.

.9 Anchor with Hilti HY 200 or approved equivalent.

2.2 FABRICATION

.1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2 and RSIC Reinforcing Steel Manual of Standard Practice.

.2 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.

2.3 SOURCE QUALITY CONTROL

.1 Provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis, a minimum of 4 weeks prior to beginning reinforcing work.

.2 Upon request, inform Departmental Representative of proposed source of material to be supplied.

Part 3 Execution

3.1 PREPARATION

.1 Galvanizing to include chromate treatment.

.1 Duration of treatment to be 1 hour per 25 mm of bar diameter.

.2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

.3 Follow manufacturer’s indications for anchors.

3.2 FIELD BENDING

.1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.

.2 When field bending is authorized, bend without heat, applying slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.3 PLACING REINFORCEMENT

.1 Place reinforcing steel as indicated on placing drawings in accordance with CSA-A23.1/A23.2.

.2 Prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.

.3 Ensure cover to reinforcement is maintained during concrete pour.

3.4 FIELD TOUCH-UP

.1 Touch up damaged and cut ends of galvanized reinforcing steel with compatible finish to provide continuous coating.

3.5 CLEANING

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

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

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

END OF SECTION

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Measurement and Payment:

.1 Measure cast-in-place concrete in sub-structure in cubic metres calculated from neat dimensions authorized in writing by Departmental Representative. The price covers supply of materials, Interstar Stone Castle BN-2739R ready mix colour pigments (2 bags), bentonite waterproofing at the required locations, chamfers, preparation of surfaces in contact with new concrete, membranes and shear studs, labour, curing, joints, correction, cleaning, finishing and all incidental expenses.

.1 Concrete placed beyond dimensions indicated will not be measured.

.2 No deductions will be made for volume of concrete displaced by reinforcing steel, structural steel, or piles.

.3 Heating of members in cold weather will not be recorded for payment purposes.

.4 Coping sample will not be taken into account.

.2 The support base will be measured per cubic metre of placed concrete. Price includes cleaning of surfaces, labour, supplies and all incidental expenses.

.1 Concrete placed beyond dimensions indicated will not be measured.

.3 Repairs with extra wall thickness are paid per square metre. Price includes supply of materials, Interstar Stone Castle BN-2739R ready mix colour pigments (2 bags), Dayton Superior Colonial Dry Stack type formliners, chamfers, preparation of surfaces in contact with new concrete, labour, joints, correction, cleaning, finishing and all incidental expenses.

.4 Cold-weather protection using RSI 0.4 layered insulation is paid per square metre of new unformed concrete surfaces covered with insulation. Price includes supplies, installation of insulation and all incidental expenses.

.5 Cold-weather protection using sheltering and heating is paid per square metre of new concrete in contact with the ground, formwork, existing concrete. Price includes supply of sheltering, heating and all incidental expenses.

1.2 REFERENCES

.1 Abbreviations and Acronyms:

.1 Portland Cement: hydraulic cement, blended hydraulic cement (XXb – b denotes blended) and Portland-limestone cement.

.1 Type GU, GUb and GUL – General use cement.

.2 Type MS and MSb – Moderate sulphate-resistant cement.

.3 Type MH, MHb and MHL – Moderate heat of hydration cement.

.4 Type HE, HEb and HEL – High early-strength cement.

.5 Type LH, LHb and LHL – Low heat of hydration cement.

.6 Type HS and HSb – High sulphate-resistant cement.

.2 Fly ash:

.1 Type F – with CaO content less than 15%.

.2 Type CI – with CaO content ranging from 15 to 20%.

.3 Type CH – with CaO greater than 20%.

.3 GGBFS – Ground, granulated blast-furnace slag.

.2 Reference Standards:

.1 ASTM International

.1 ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.

.2 ASTM C309-07, Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

.3 ASTM C494/C494M-10a, Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM C1017/C1017M-07, Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.

.2 CSA International

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06, Qualification Code for Concrete Testing Laboratories.

.3 CSA A3000-08, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.3 Transports Québec Standard

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Concrete pours: provide accurate records of poured concrete items indicating date and location of pour, quality, air temperature and test samples taken as described in PART 3 – FIELD QUALITY CONTROL.

.3 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.

1.4 QUALITY ASSURANCE

.1 Quality Assurance: in accordance with Section 01 45 00 – Quality Control.

.2 Submit to Departmental Representative, minimum 3 weeks prior to starting concrete work, valid and recognized certificate from plant delivering concrete.

.1 Provide test data and certification by qualified independent inspection and testing laboratory that materials and mix designs used in concrete mixture will meet specified requirements.

.3 Minimum 3 weeks prior to starting concrete work, submit proposed quality control procedures for review by Departmental Representative on following items:

.1 Hot weather concrete.

.2 Cold weather concrete.

.3 Curing.

.4 Finishes.

.5 Formwork removal.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.

.2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

Part 2 Products

2.1 DESIGN CRITERIA

.1 To CSA A23.1/A23.2, and as described in MIXES of PART 2 – PRODUCTS.

2.2 MATERIALS

.1 Portland Cement: to CSA A3001, Type GU.

.2 Blended hydraulic cement: Type GUb to CSA A3001.

.3 Supplementary cementing materials: with minimum 20% GGBFS and Type F fly ash replacement, by mass of total cementitious materials to CSA A3001.

.4 Water: to CSA A23.1.

.5 Aggregates: to CSA A23.1/A23.2.

.6 Admixtures:

.1 Air entraining admixture: to ASTM C260.

.2 Chemical admixture: to ASTM C494 and ASTM C1017. Departmental Representative to approve set accelerating or set retarding admixtures during cold and hot weather placing.

2.3 MIXES

.1 Alternative 1 – Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.

.1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.

.2 Provide concrete mix to meet following hard state requirements:

.1 Durability and class of exposure: C-1.

.2 Compressive strength: 35 MPa minimum at 28 days.

.3 Aggregate size: 20 mm.

.3 Provide quality management plan to ensure verification of concrete quality to specified performance.

.4 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

.5 Concrete for copings, repairs with extra wall thickness and drainage downpipes must contain pigment. A sample must be produced at least three (3) weeks before on-site use. The sample must have the following dimensions at a minimum: 1000 mm by 1000 mm and a minimum thickness of 150 mm. The sample must have a surface finish the same as required on the copings, and must include a control joint and an aesthetic joint. The sample must also show the detail of non-shrink grout extra thickness under the base of the posts with the same pigment as the coping concrete. Where necessary and in accordance with the Departmental Representative's directives, the pigments and aggregates used or surface finish must be adjusted to meet Department expectations.

A second sample of the same size and incorporating the proposed adjustments must be completed at least two (2) weeks before copings are concreted. Where necessary, adjustments can be made to the final mix or to the finish, to meet Department expectations.

The approved sample will become the standard to be met on-site.

.6 XIV-R self-placing concrete is to be used for repairs with extra thickness on wall sections, in accordance with Transports Québec standard 3101.

.7 All concrete surfaces visible upon completion of work (coping concrete, concrete for drainage downpipes and concrete for repairs with extra thickness on wall sections) must contain pigment, specifically Interstar Stone Castle BN-2739R (two bags).

Part 3 Execution

3.1 PREPARATION

.1 Obtain Departmental Representative's written approval before placing concrete.

.1 Provide 24 hours minimum notice prior to placing of concrete.

.2 Place concrete reinforcing in accordance with Section 03 20 00 – Concrete Reinforcing.

.3 During concreting operations:

.1 Development of cold joints not allowed.

.2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.

.4 Pumping of concrete is permitted only after approval of equipment and mix.

.5 Ensure reinforcement and inserts are not disturbed during concrete placement.

.6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.7 Protect previous Work from staining.

.8 Clean and remove stains prior to application for concrete finishes.

.9 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.10 Do not place load upon new concrete until authorized by Departmental Representative.

3.2 INSTALLATION/APPLICATION

.1 Do cast-in-place concrete work to CSA A23.1/A23.2.

.2 Sleeves and inserts:

.1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through any element, except where indicated or approved by Departmental Representative.

.2 Where approved by Departmental Representative, set sleeves, ties, pipe hangers and other inserts and openings as indicated or specified elsewhere.

.3 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing concrete.

.4 Confirm locations and sizes of sleeves and openings shown on drawings.

.3 Anchor bolts:

.1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.

.2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.

.3 Protect anchor bolt holes from water accumulations, snow and ice build-ups.

.4 Set bolts and fill holes with shrinkage compensating grout.

.5 Locate anchor bolts used in connection with expansion shoes, rollers and rockers with due regard to ambient temperature at time of erection.

.4 Drainage holes and weep holes:

.1 Form weep holes and drainage holes in accordance with Section 03 10 00 – Concrete Forming and Accessories. If wood forms are used, remove them after concrete has set.

.2 Install weep hole tubes and drains as indicated.

.5 Apply SIKA 212 or equivalent non-shrink grout under the railing post bearing plates in accordance with manufacturer's recommendations to obtain a contact surface equal to 100% of the grouted area.

.6 Finishing and curing:

.1 Finish concrete to CSA A23.1/A23.2.

.2 Use procedures as reviewed by Departmental Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.

.3 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.

.4 For curing, use synthetic fibre tarps saturated with water once they are put in place, and then cover them with waterproof sheets to maintain concrete surface humidity. Surfaces must be completely covered. Tarps must be kept wet at all time to maintain a thin layer of water on concrete surfaces throughout the curing period. Water used to cure concrete must be the same as the concrete mix water, and water temperature must not be below 10 °C.

.5 Screed the coping unless otherwise indicated. Finish visible concrete surfaces using a pressurized jet of water (15 MPa, flow 20 l/min, concentrated circular spray nozzle, nozzle-concrete surface distance between 150 and 200 mm). Surface finishing must remove all debris and make colours uniform. Finishing must be done on prepared samples to test results.

.6 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.

.7 Compacting of material (soil, aggregate, asphalt) is prohibited within 30 m of fresh concrete until it reaches compression resistance of at least 70% f'c as verified by test samples that have been cured under the same conditions as concrete used in Work.

.7 Cold-weather protection

.1 Pouring concrete outdoors is prohibited if temperature is below 0°C. After pouring, RSI 0.40 dot insulation must be installed if the outside temperature is liable to go below 5°C in the 48 hours after placing the concrete (based on regional weather forecasts).

.2 The Contractor must provide shelter and heating for all concrete placed between November 1 and March 31.

.3 Insulation protection consists of completely covering all plastic-state concrete surfaces with an insulating material. Each layer of insulating material must be waterproof and made of closed cell foam with RSI 0.40 thermal resistance. The Contractor must have the Departmental Representative approve the number of layers of insulating material to be installed the day before placing the concrete. The Departmental Representative may ask the Contractor to increase or decrease number of layers, depending on changes in concrete temperature during the protection period; layers must be removed / added within three hours of the Departmental Representative's request. The insulating material must be installed

to prevent any exposure of concrete surfaces to outdoor air throughout the protection period. Edges of insulating materials must overlap by at least 75 mm.

.4 Shelter and heating protection requires building a shelter to surround the works. The shelter must be built so that surfaces to be concreted are covered with tarps. The covers must be waterproof, resistant and attached so that they do not move during the protection period. The shelter must be tall and large enough to allow for concrete placement, finishing and curing inside the shelter. Heating equipment such as boilers or heaters, etc., must be sufficient in number and capacity to maintain the concrete at the required temperature. A hot air current must circulate inside the shelter. The heat must reach all surfaces, whether formed or not. If the heating devices release carbon gas, the gas must be exhausted outside the shelter.

3.3 SURFACE TOLERANCE

.1 Concrete surface tolerances must comply with CSA A23.1.

3.4 FIELD QUALITY CONTROL

.1 Site tests: conduct following tests in accordance with Section 01 45 00 – Quality Control and submit report as described in PART 1 – ACTION AND INFORMATIONAL SUBMITTALS.

.1 Concrete pours.

.2 Slump.

.3 Air content.

.4 Compressive strength: 7 day and 28 day.

.5 Air and concrete temperature.

.2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.

.1 Ensure testing laboratory is certified to CSA A283.

.3 Departmental Representative will pay for tests as specified in Section 01 29 83 – Payment Procedures for Testing Laboratory Services.

.4 Departmental Representative will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.

.5 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

.6 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of its contractual responsibility.

3.5 CLEANING

.1 Clean in accordance with Section 01 74 11 – Cleaning.

END OF SECTION

MASONRY

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Work of this Section will be measured by Departmental Representative and will be paid for according to the following terms.

.1 Inspection and testing to identify the degree of degradation in joints will not be covered by a specific item in the price schedule. The cost of this work will be allocated to works for which inspections and testing are required.

.2 Pointing will be measured per square metre of surface area of masonry to be pointed.

.2 Work necessary for completion of work in this section will not be paid for separately, but will be considered an integral part of the work listed on the price schedule.

.3 Where heated enclosures are required to perform repointing work in cold weather in accordance with the standards of this specification, this work is payable under the item cold weather protection – heating and sheltering. This work is payable per square metre of surface area of masonry where repointing is required.

1.2 REFERENCES

.1 Definitions:

.1 Raking: removal of loose/deteriorated mortar to a depth suitable for repointing until sound mortar, and/or 4x joint thickness and/or a specified mm depth is reached.

.2 Back Pointing: repointing to depths greater than minimum raked depths specified, to bring mortar face to specified depth for raked joints.

.3 Repointing: filling and finishing of masonry joints from which mortar is missing, has been raked out or has been omitted.

.4 Finish Pointing: repointing face of joint.

.5 Tooling: finishing of masonry joints using tool to provide final contour.

.6 Low-pressure water cleaning: water soaking of masonry using less than 350 kPa (50 psi) water pressure, measured at nozzle tip of hose.

.7 CSA Group

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-04(C2014), Mortar and Grout for Unit Masonry.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Test and Evaluation Reports:

.1 Provide certified test reports showing compliance with specified performance characteristics and physical properties.

.2 Provide laboratory test reports certifying compliance of mortar ingredients with specifications requirements.

1.4 QUALITY ASSURANCE

.1 Masonry Contractor:

.1 Use single Masonry Contractor for masonry work.

.2 Masonry Contractor to have experience in historic stone masonry repair and conservation work on projects of similar size and complexity to Work of this Contract.

.3 Masonry Contractor to have good level of understanding of structural behaviour of masonry walls when masonry work involves replacing or repairing stones which are part of structural masonry work.

.4 Masonry Contractor will be responsible for all aspects of masonry work for duration of project.

.2 Project Supervisor:

.1 Masonry Contractor to employ a Project Supervisor with documented successful experience of historic masonry repair and conservation work of required for this Contract. Project Supervisor to be present on site full-time for duration of Work.

.2 Demonstrate competence levels to satisfaction of Departmental Representative before undertaking Work.

.3 Masons:

.1 Masons to have certificate of qualification with experience in historic stone masonry repair and conservation work required for this Contract.

.2 Masons to have proof of licence certification for proprietary restoration mortars.

.4 Cement grouting: grouting activities must be undertaken by workers experienced in cement grout manipulation and cement grouting methods.

.5 Departmental Representative reserves the right to reject Masonry Contractor or proposed Project Supervisor, mason or apprentice if documentation provided does not demonstrate level of experience or skill required for successful completion of Work of this Contract.

.6 Obtain written approval from Departmental Representative for changes to qualified personnel.

.7 Mock-ups:

.1 Perform mock-ups (test area) in accordance with Section 01 45 00 – Quality Control.

.2 Perform work on a test area of wall 2 m x 2 m selected with the Departmental Representative. At the request of the Departmental Representative, this can be divided into two separate sections with an equivalent total surface area.

.3 Notify the Departmental Representative at least 24 hours prior to commencing work on the test area.

.4 Clean mock-up (test) area with soft natural bristle brush.

.5 Perform mock-up under supervision of Departmental Representative to demonstrate a full understanding of specified procedures, techniques and formulations is achieved before work commences.

.6 Perform work on the test area in the places indicated by the Departmental Representative.

.7 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with masonry repointing work.

.8 Repeat work on the test area until the results are satisfactory to the Departmental Representative.

.9 Mock-ups will be used to:

.1 Judge quality of work, substrate preparation, operation of equipment, material preparation and application, and curing methods.

.2 Determine joint finish required.

.3 Test to determine compliance with property requirements.

.10 Accepted mock-ups will demonstrate minimum standard for this work.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store cementitious materials and aggregates in accordance with CSA A23.1/A23.2.

.3 Store lime putty in plastic lined sealed drums.

.4 Keep material dry. Protect from weather, freezing and contamination.

.5 Remove rejected or contaminated material from site.

.6 Replace defective or damaged materials with new.

1.6 SITE CONDITIONS

.1 Ambient conditions:

.1 When ambient temperature is below 10 degrees C or is forecast to fall below 10 degrees C within 24 hours:

.1 Maintain temperature of lime at or above 10 degrees C at all times.

.2 Store mortar materials for immediate use within heated enclosure in accordance with Section 01 56 00 and allow mortar materials to reach minimum temperature of 5 degrees C before use.

.3 Heat sand and aggregate to a minimum temperature of 10 degrees C and maximum 30 degrees C.

.1 Heat water to a minimum temperature of 20 degrees C and a maximum of 30 degrees C.

.4 Provide hot water to a maximum 40 degrees C on site during cold weather.

.5 Provide enclosure system around curing area to ensure that stated conditions are maintained for curing period.

.6 Use heated temporary enclosures to maintain temperatures above 10 degrees C in cold weather only with written approval of material manufacturer and Departmental Representative.

.7 Submit enclosure system for approval of Departmental Representative.

.2 Remove work exposed to temperatures lower than 10 degrees C as directed by Departmental Representative.

.3 When ambient temperature is above 21 degrees C:

.1 Protect repointed areas from direct sunlight and wind.

.2 Use protective methods acceptable to the Departmental Representative.

.4 Provide humid cure for a minimum of 7 days.

.5 Use and prepare mortar when the ambient air temperature is between 10 and 27 degrees C at the location of the work.

.6 Maintain sand and aggregate temperature between 10 and 30 degrees C.

.7 Mix cement with water or with aggregate or with water-aggregate mixtures when ambient air temperature is between 10 and 30 degrees C.

.8 Maintain mortar mix temperature between 10 and 30 degrees C.

Part 2 Products

2.1 MORTAR

.1 Mortar: Type S to ASTM C 1329.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify masonry, staging and storage areas and notify Departmental Representative in writing of conditions detrimental to acceptable and timely completion of Work.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative in writing of areas of deteriorated masonry not previously identified.

.2 Notify Departmental Representative immediately if evidence of hazardous materials is discovered in work area.

.3 Stop work in that area and immediately report to Departmental Representative evidence of hazardous materials.

3.2 SPECIAL TECHNIQUES

.1 Examine mortar joints.

.1 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as aspects of quality of work which establish authenticity of original work.

.2 Replicate the style selected by Departmental Representative.

.2 Test mortar joints.

.1 Procedure for testing: examine joints visually for signs of deteriorated masonry such as voids, spalled surfaces, cracking or micro-cracking at edges of joints or across joints or dense cement-rich mortar.

.2 Test joints not visually deteriorated as follows:

.1 Test for voids and weakness by using hammers or other approved means.

.2 Perform examination and testing in cooperation with Departmental Representative, and mark and record unsound joints.

3.3 RAKING JOINTS

.1 Use a manual air hammer, maximum weight 7 kg, with a bit size not exceeding the diameter of the shank. Where this could cause damage, reduce the tool capacity.

.2 Use manual raking tool to obtain clean masonry surfaces.

.1 Remove deteriorated and adhered mortar from masonry surfaces to sound mortar and to full depth of deteriorated mortar, but in no case less than 20 mm to 2x joint thickness. Depth should never exceed 250 mm relative to the existing mortar level and stones must not be dislodged. Remove mortar to leave square corners and a flat surface at back of cut.

.2 Clean out voids and cavities encountered.

.3 Remove mortar without chipping, altering or damaging masonry units.

.4 Where use of power tools to remove mortar is deemed appropriate by Departmental Representative:

.1 Rake out using maximum 86 mm diameter blades to centre of joint only, to a maximum depth that is equal to half of joint width. Mortar must remain on each side of saw cut. Raking must not touch masonry units.

.2 Stop saw cut 50 to 75 mm from end of vertical and discontinuous horizontal joints. Do not cut into masonry units.

.3 Notify Departmental Representative to inspect raking, prior to removing remaining mortar with hand tools.

.4 Remove remaining mortar with hand tools.

.5 Clean by compressed air or with non-ferrous brush surfaces of joints without damaging texture of exposed joints or masonry units.

.6 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.

.7 Leave no standing water.

.8 Replace stone damaged as a result of careless raking of saw cutting, at no cost to Owner.

.9 Remove mortar from top, bottom and side joints, with back surface of joint square and of an even depth.

.10 Conduct raking and repointing continuously over small sections at a time to prevent wall breakage. Do not leave joints raked out for several days running. Plan the sequence in such a way that the work progresses continuously.

3.4 REPOINTING

.1 When required repair and replacement work is complete carry out repointing.

.2 Before repointing, wash down wall to be repointed and allow to dry to damp, but not wet. Ensure that dust and debris are removed from joints and wall surfaces prior to repointing.

.3 Keep masonry damp while pointing is being performed.

.4 Completely fill joint with mortar.

.1 If surface of masonry units has worn rounded edges keep pointing back 1 mm from surface to maintain same width of joint.

.2 Avoid feathered edges.

.3 Pack mortar firmly into voids and joints, ensuring full contact with back and sides of joint and leaving no voids.

.5 Build-up pointing in layers not exceeding 25 mm in depth.

.1 Allow each layer to set before applying subsequent layers.

.2 Maintain joint width.

.6 Finish joints to match existing profile and as shown on drawings.

.1 Tool, compact and finish using jointing tool or mason's slick to force mortar into joint. Ensure jointing tool fits within width of joint. Use tools of varying widths to meet this requirement.

.2 Provide final exposed aggregate texture when mortar has dried to thumb-print hardness by striking surface of joint with a stiff bristle brush or a lightly moistened sponge.

.7 Remove excess mortar from masonry face before it sets.

3.5 PROTECTION DURING CURING PROCESS

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.

.1 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.

.2 Cover with waterproof tarps to protect newly laid mortar from frost, rainfall and rapid drying conditions such as wind.

.1 Maintain tarps in place for minimum of 2 weeks after repointing.

.2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.3 Anchor coverings securely in position.

.4 Damp cure:

.1 Provide damp cure for back pointing and finish pointing mortars, at a minimum temperature of 10 degrees C.

.2 Install and maintain wetted burlap protection during the curing process: use heavy and tight-woven burlap.

.1 Minimum 7 days curing time.

.3 Wet mist burlap only – ensure no direct spray reaches surface of curing mortar.

.4 Ensure burlap is not in contact with masonry. Leave air space of minimum 50 mm between burlap and masonry.

.5 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.6 Provide for off-hours and week-end work as required to maintain specified curing conditions.

.5 Protect from drying winds. Pay particular attention at corners of structure.

.6 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:

.1 Minimum 7 days in summer.

.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

3.6 CLEANING

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

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

.2 Clean surfaces thoroughly of mortar droppings, stains and other blemishes resulting from work of this contract on a daily basis, as work progresses.

.3 Remove droppings and splashings using clean water and thick cotton rags.

.4 Clean masonry with stiff natural bristle brushes and plain water only if mortar has fully cured.

.5 Clean masonry with low pressure 15 to 45 psi or 103 to 310 kPa clean water and soft natural bristle brush.

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

3.7 PROTECTION OF COMPLETED WORK

.1 Protect adjacent finished work against damage which may be caused by ongoing work.

END OF SECTION

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Work of this Section will be measured by Departmental Representative and will be paid for under the following payment items.

.1 Grouting of masonry will be measured in litres of grout injected into masonry walls.

1.2 REFERENCES

.1 Definitions:

.1 Grout: cementitious or epoxy mixture of liquid consistency suitable for pouring or pumping, to fill voids between masonry elements.

.2 CSA Group

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.2 CAN/CSA-A179-04(R2014), Mortar and Grout for Unit Masonry.

.3 CSA-A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet for grout. Product literature and datasheets must include product characteristics, performance criteria, physical size, finish and limitations.

.3 Field Quality Control Submittals:

.1 Submit a copy of field log daily to Departmental Representative.

.2 Submit written description of methodology and equipment list at least 14 days before beginning of grout work.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in a clean, dry, well-ventilated area.

.2 Store materials at temperatures between 5 degrees C to 38 degrees C unless otherwise stated by manufacturer.

.3 Replace defective or damaged materials with new.

1.5 SITE CONDITIONS

.1 Ambient conditions:

.1 Maintain temperature of masonry elements to be grouted above 5 degrees C throughout their thickness, during and 48 hours after grouting.

.2 Maintain temperature of elements to be grouted between 21 to 24 degrees C throughout its thickness during and 48 hours after grouting.

.3 Provide and maintain temporary enclosure and heating equipment to maintain specified temperatures.

Part 2 Products

2.1 MATERIALS

.1 Sealing grout: Sika injection 490 or approved equivalent.

.2 Injection resin: Sikadur 52 or 451, depending on width of defects, or approved equivalent.

2.2 EQUIPMENT

.1 Injection nozzle: mechanical packer with non-return valve (for injection with drilling) or surface type with non-return valve (for injection without drilling).

.2 Injection pump: Sika EL-1/2 or approved equivalent.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for grout installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Report to Departmental Representative before start of work possible structural masonry problems and conditions that do not conform to those specified, including existing voids or possible openings which risk being compromised when grout will flow.

.3 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.4 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 EXAMINATION

.1 Provide required assistance to facilitate taking of grout samples and inspection work.

.2 Inspect surfaces of wall before commencing injection work.

3.3 CONDITION OF SURFACES

.1 Evaluate moisture content of masonry work by taping 3 x 3 m polyethylene sheet to masonry surface. If moisture collects on underside of sheet before epoxy would cure, allow masonry work to dry sufficiently before commencing injection work.

3.4 MEASUREMENT AND MIXING

.1 Mix and use products in accordance with manufacturer's instructions.

3.5 FIELD LOG

.1 Maintain log of grouting work containing collection of information, including:

.1 Course of pumping data including calibration of equipment used.

.2 Pumping mode.

.3 Injection site.

.4 Pumping pressure at injection sites.

.5 Readings of pressure and flow injection to be taken, either by data loggers or manually.

.6 Equipment used.

.7 Staff on site.

.8 Drilling Plan.

3.6 PREPARATION

.1 Ensure substrate is free of loose material.

.2 Wet surfaces, deep into substrate.

3.7 INSTALLATION

.1 Safety:

.1 Epoxy materials may be skin irritants or sensitizers. Avoid contact with eyes, skin, inhalation of vapours and ingestion.

.2 Insert tubes.

.3 Seal leaks with quick-setting cement.

3.8 CLEANING

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

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

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

END OF SECTION

METALS

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Work of this Section will be measured by Departmental Representative and paid for as described below.

- .1 Railings supplied and installed will be measured in linear metres. This price includes railing supply, with tracks and fitting components, stainless steel anchors, drilling and anchoring material, placement, self-levelling non-shrinkage grout, installation and any incidental expenses.
- .2 Removal, repainting and reinstallation of existing railings will be measured in linear metres. This price includes removal, transportation, surface preparation and painting of components, placement, stainless steel anchors, drilling and anchoring material, placement, self-levelling non-shrinkage grout, installation and any incidental expenses.
- .3 Supply and installation of bollards is paid per installed unit. The price includes supply of various components, foundation, installation and any incidental expense.

.2 Work necessary for completion of work of this Section will not be paid for separately but will be considered as incidental to the work listed on the schedule.

1.2 REFERENCES

.1 ASTM A48/A48M-03, Standard Specification for Gray Iron Castings.

.2 ASTM International

- .1 ASTM A53/A53M-07, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
- .2 ASTM A307-07b, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.3 CSA International

- .1 CSA G40.20/G40.21-F04 (C2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA G164-FM92 (C2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .3 CSA S16-09, Design of Steel Structures.
- .4 CSA W48-F06, Filler Metals and Allied Materials for Metal Arc Welding (Developed in co-operation with the Canadian Welding Bureau).

.4 Ministère des Transports du Québec (MTQ, Quebec Ministry of Transport)

- .1 Standard 10102, Zinc-based paint and paint system for steel structures.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for railings, tubing and bolts, and include product characteristics, materials, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29.06 – Health and Safety Requirements.

.1 For finishes, coatings, primers, and paints applied on site: indicate VOC concentration in g/L.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Quebec, Canada.

.2 Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

1.4 QUALITY ASSURANCE

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

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

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

.1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Plain grey cast iron, Class 30, to ASTM A-48-76 and cast in one piece.

.2 Smooth steel pipe for railings and bollards: to ASTM A53/A53M, standard weight.

.3 Welding materials: to CSA W59.

.4 Welding electrodes: to CSA W48 Series.

.5 Bolts and anchor bolts: to ASTM A307.

.6 Grout: non-shrink, non-metallic, 15 MPa at 24 hours.

2.2 FABRICATION

.1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.

2.3 FINISHES

.1 Using steel shot blasting, clean existing cast iron railing posts that require repainting and new posts to be painted. A coat of primer must be applied to the clean surface within four (4) hours of cleaning.

.2 Primer coat (to be applied within four (4) hours of cleaning): zinc chromate 72/019 for one part 99/200 (1GP121 specifications), followed by an accelerator within twelve (12) hours, by applying an undercoat. International Paints (Canada) Ltd.

.3 Undercoat (applied within twelve (12) hours after the primer coat): Chromate primer red 729041, AGP40 specification.

.4 Initial finish coat (factory-applied): Interkote industrial enamel 30/021, AGPS61 specification.

.5 Second finish coat (applied onsite): same specifications as the initial coat.

.6 Paint to be applied in accordance with manufacturer's temperature and moisture standards.

.7 Steel pipes, new and existing: hot dipped galvanizing with zinc coating 600 g/m^2 to CAN/CSA-G164.

.8 Pipes (tracks and bollards) must be painted black, to MTQ standard 10102.

.9 Railing anchors are stainless steel.

.10 Anchors must be painted black, to MTQ standard 10102.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 ERECTION

.1 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.

.2 Provide suitable means of anchorage acceptable to Departmental Representative, as indicated in plans.

.3 Exposed fastening devices to match finish and be compatible with material through which they pass.

.4 Make field connections with bolts to CSA S16.

.5 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.

3.3 CLEANING

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

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

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

3.4 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by metal fabrications installation.

END OF SECTION

EARTWORK

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Work in this section will be measured by the Departmental Representative and will be paid for in accordance with the following.

.1 Cofferdams are paid globally. Price includes supply, installation, maintenance, removal, labour and all incidental expenses.

.2 Tree and shrub protection and local deforestation are paid globally. Price includes the supply, maintenance and installation of protection equipment, the clearing of trees identified and approved by the Departmental Representative, felling and grubbing, disposal of materials, labour and all incidental expenses.

.3 Saw cuts in the asphalt marking off the work area are paid per linear metre. Price includes saw cuts, labour and all incidental expenses.

.4 Removal, storage and reinstallation of interlocking paving stone are paid per square metre. Price includes removal and storage of the paving stone, the supply, installation and compacting of crusher dust and sealants, levelling, reinstallation of paving stone, labour and all incidental expenses.

.5 Removal and disposal of sodded surfaces are paid per square metre. Price includes disposal at an approved site, labour and all incidental expenses.

.6 Removal and piling of topsoil is paid per square metre. Price includes removal, protection and amendment of the soil and all incidental expenses.

.7 The 2nd class excavation, including offsite disposal of soil and asphalt at an approved site, is paid globally. Price includes excavation (including accurate survey of existing profile), the removal of existing asphalt (including accurate survey of existing profile), offsite disposal, backfilling, labour and all incidental expenses.

.8 Temporary retaining works are paid globally. Price includes the supply of materials, installation, labour, maintenance, removal and all incidental expenses.

.9 Perforated 200-mm diameter PE (Type 2) drains with geotextile and minimum equivalent thickness of 180 kPa is paid per linear metre. Price includes the supply of materials, labour and all incidental expenses.

.10 Drilling of 100-mm diameter holes for insertion of a 75-mm diameter drain across the existing wall are paid per unit. Price includes drilling, the supply and insertion of the drain, perforated casing or connection to the drain behind the wall, supplies and all incidental expenses. Grout injection around the drains is not included.

.11 Backfilling of excavations with MG-112 is paid per cubic metre. Price includes supply of materials, compacting, labour and all incidental expenses.

.12 Replacement of topsoil is paid per square metre. Price includes storage, amendment if required, compacting and all incidental expenses.

.13 Vertical drainage drop using MG-112 is paid per unit. Price includes excavation, materials, labour and all incidental expenses.

.14 Installation of 300-500 riprap is paid per linear metre. Price includes materials, labour and all incidental expenses.

.2 The provision of plans for the Departmental Representative's approval as per section 1.4 of this Section will not be paid and will be considered an integral part of the work.

1.2 REFERENCES

.1 ASTM International

.1 ASTM D698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3) (600kN-m/m^3).

.2 CSA International

.1 CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.3 Bureau de Normalisation du Québec (Quebec Standards Office)

.1 BNQ 2560-114, Travaux de génie civil – Granulat.

.2 BNQ 3625-115, Tuyaux et raccord en polyéthylène (PE) – Tuyaux flexibles pour le drainage – Caractéristiques et méthodes d'essais.

.3 BNQ 3625-110, Tuyaux et raccord en polyéthylène (PE) – Tuyaux semi-rigides ou flexibles pour l'évacuation des eaux de ruissellement, le drainage des sols et les ponceaux – Caractéristiques et méthodes d'essais.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Storage and Handling Requirements:

.1 Storage sites behind walls must be located at a distance equalling the height of the walls at a minimum. The sites must be approved by the Departmental Representative prior to their use.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 The Contractor must provide the Departmental Representative with a cofferdam plan, for approval, at least 14 days before work begins.

.1 The cofferdam plan must include the methods, equipment and installation sequence proposed by the Contractor to avoid compromising the overall stability of works.

.2 The cofferdam plan must show the detailed placement of equipment relative to existing works (retaining wall), access roads to be used and materials storage areas.

.3 The cofferdam plan must be signed and sealed by an engineer in good standing with the Ordre des ingénieurs du Québec. The signing engineer must be on site for the first work shift.

.2 The Contractor must provide the Departmental Representative with a 2nd class excavation plan, including offsite soil disposal at an approved site, for approval, at least 14 days before work begins.

.1 The 2nd class excavation plan, including offsite soil disposal at an approved site, must include the methods, equipment and installation sequence proposed by the Contractor to avoid compromising the overall stability of works.

.2 The 2nd class excavation plan, including offsite soil disposal at an approved site, must show the detailed placement of equipment relative to existing works (retaining wall), access roads to be used and materials storage areas.

.3 The 2nd class excavation plan, including offsite soil disposal at an approved site, must be signed and sealed by an engineer in good standing with the Ordre des ingénieurs du Québec. The signing engineer must be on site for the first work shift.

.3 The Contractor must provide the Departmental Representative with a plan for backfilling excavations using MG-112 fill, for approval, at least 14 days before work begins.

.1 The MG-112 backfilling plan must include the methods, equipment and installation sequence proposed by the Contractor to avoid compromising the overall stability of works.

.2 The MG-112 backfilling plan must show the detailed placement of equipment relative to existing works (retaining wall), access roads to be used and materials storage areas.

.3 The MG-112 backfilling plan must be signed and sealed by an engineer in good standing with the Ordre des ingénieurs du Québec. The signing engineer must be on site for the first work shift.

.4 The Contractor must provide the Departmental Representative with a 300-500 riprap installation plan, for approval, at least 14 days before work begins.

.1 The 300-500 riprap installation plan must include the methods, equipment and installation sequence proposed by the Contractor to avoid compromising the overall stability of works.

.2 The 300-500 riprap installation plan must show the detailed placement of equipment relative to existing works (retaining wall), access roads to be used and materials storage areas.

.3 The 300-500 riprap installation plan must be signed and sealed by an engineer in good standing with the Ordre des ingénieurs du Québec. The signing engineer must be on site for the first work shift.

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

Part 2 Products

2.1 MATERIALS

.1 Riprap stone is 300-500 calibre. The stone used must be pre-washed to remove all particles that could result in the release of sediment when placed in water. The stone must be washed before it arrives at the site.

.2 Tree protection materials require approval by Departmental Representative.

.3 Existing interlocking paving stone to be removed during work must be kept and stored securely during work.

.4 Perforated 200-mm diameter drains with geotextile must be PE (Type 2), with a minimum equivalent thickness of 180 kPa, and must comply with standard BNQ-3624.

.5 Non-perforated black PVC drains across the walls must be 75 mm in diameter. These drains must be spliced to the 200-mm perforated drain, unless otherwise indicated on the plans, and must comply with standard BNQ-3624.

.6 Backfill for excavation at the existing wall and vertical drains must be MG-112 as per standard BNQ 2560-114. Thickness as indicated on the plan.

.7 The MG-112 fill must comply with standard BNQ-2560-114.

.8 Certificates of conformity and/or product data for materials must be submitted to the Departmental Representative for approval at least seven (7) days before the first delivery to the site.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions:

.1 Before commencing work, establish locations of buried services on and adjacent to site.

.2 Evaluation and Assessment:

.1 Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.

.2 Testing of materials and compaction of backfill and fill will be carried out by testing laboratory designated and paid by the Department.

.3 Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.

.4 Before commencing work, conduct, with Departmental Representative, condition survey of existing structures, trees and plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

3.2 PREPARATION WORK FOR EXCAVATING NEAR THE FORT WALL AND FOUNDATIONS

.1 Survey the existing profile at the excavated surface.

.2 Protection of in-place conditions:

- .1 During excavation work, the Contractor must protect the foundations and foundation soil of the Fort and retaining wall from frost.
- .2 Keep excavations clean and free of standing water and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative's approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are to remain undisturbed.

.3 Removal:

- .1 Remove interlocking paving stone that interferes with work; the stones must be kept and securely stored during work.
- .2 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.
- .3 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .4 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.
- .5 Remove asphalt.
- .6 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within areas designated on drawings.
- .7 Remove stumps and tree roots below footings, slabs, and paving, and to 600 mm below finished grade elsewhere.

3.3 EXCAVATION

.1 Shore and brace excavations using temporary retaining works, protect slopes and embankments, and carry out work in compliance with municipal and provincial regulations.

.2 Topsoil stripping:

- .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
- .2 Strip topsoil to depths as directed by Departmental Representative. Avoid mixing topsoil with subsoil.
- .3 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.

.4 Stockpile in locations as directed by Departmental Representative.

.5 Dispose of unused topsoil off site as directed by Departmental Representative.

.3 Excavate as required to carry out work, in all materials met.

.1 Do not disturb soil or rock below bearing surfaces. Notify Departmental Representative when excavations are complete.

.2 Fill excavation taken below depths shown without Departmental Representative's written authorization with concrete of same strength as for footings.

3.4 DRAINAGE

.1 As defined in the plans, for vertical drains the Contractor must dig holes 300 mm in diameter. For each vertical drain, a 100-mm diameter hole must be drilled on the outside of the wall (downstream side), and aligned with the vertical drains. A 75-mm diameter drain must be inserted into the wall. A perforated casing must be attached to the drain in the centre of the hole. Once the drainage system is installed, the holes must be filled with MG-112 material. The lip of the drain must be grouted as set out in section 04 03 09.

.2 As defined in the plans, a 200-mm diameter drain must extend along the existing wall and the new concrete reinforcement. A 100-mm diameter hole must be drilled on the outside of the wall (downstream side), and aligned with the drain running along the walls. A 75-mm diameter drain must be inserted into the wall. The lip of the drain must be grouted as set out in section 04 03 09.

3.5 SITE QUALITY CONTROL

.1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.

3.6 BACKFILLING

.1 Start backfilling only after inspection and receipt of written approval of fill material and spaces to be filled from Departmental Representative.

.2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.

.3 Lateral support: maintain even levels of backfill as work progresses, to equalize earth pressures.

.4 Compaction of subgrade: compact existing subgrade under walks and paving to same compaction as specified for fill. Fill excavated areas with gravel and sand compacted as specified for fill.

.5 Placing:

.1 Place backfill, fill and basecourse material in 150 mm lifts. Add water as required to achieve specified density.

.2 Place unshrinkable fill in areas as indicated. Consolidate and level unshrinkable fill with internal vibrators.

.6 Compaction: compact each layer of material to following densities for material to ASTM D698:

.1 To underside of basecourses: 95%.

.2 Basecourses: 100%.

.3 Elsewhere: 90%.

.7 Sodded surfaces: See section 32 91 19 13 for spreading of topsoil and earthwork and section 32 92 23 for installation of turf.

3.7 GRADING

.1 Grade so that water will drain away from buildings and paved areas, to catch basins and other disposal areas approved by Departmental Representative. Grade to be gradual between finished spot elevations as indicated.

3.8 CLEANING

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

.1 Dispose of cleared and grubbed material offsite daily.

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

END OF SECTION

OUTDOOR FACILITIES

Part 1 General

1.1 PRICE AND PAYMENT PROCEDURES

.1 Work of this Section will be measured by Departmental Representative and will be paid for according to the following terms.

.1 MG 20 base materials for the driving surface are payable per theoretical cubic metre. The price includes supply, compaction, installation and any incidental expense.

.2 MG-112 sub-base materials for the driving surface are payable per theoretical cubic metre. The price includes supply, compaction, installation and any incidental expense.

1.2 REFERENCES

.1 Bureau de Normalisation du Québec (Quebec Standards Office)

.1 BNQ 2560-114, Travaux de génie civil – Granulat.

.2 ASTM D1557-[09], Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000ft-lbf/ft^3) (2,700kN-m/m^3).

1.3 DELIVERY, STORAGE AND HANDLING

.1 Storage and Handling Requirements:

.1 Storage sites behind walls must be located at a distance equal to or greater than the equivalent of the height of the walls. The sites must be approved by the Departmental Representative prior to their use.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Certification of compliance

.1 Submit a certification of compliance for each crushed granular store within seven (7) days before the first delivery to the site. The certification of compliance attests to the fact that the materials meet the requirements.

.2 Certifications of compliance must include the following information:

.1 The name of the registered laboratory or ISO 9001 certified manufacturer laboratory.

.2 Complete results from sieve analyses of materials.

Part 2 Products

2.1 MATERIALS

.1 Base materials for the driving surface must be composed of MG 20 in accordance with BNQ 2560-114. A compacted thickness of 150 mm is required.

.2 Sub-base materials for the driving surface must be composed of MG 112 in accordance with BNQ 2560-114. A compacted thickness of 400 mm is required.

Part 3 Execution

3.1 PREPARATION

3.2 PLACEMENT AND INSTALLATION

.1 Place granular base materials for the sub-base and then the base. The ground beneath the sub-base layer must be inspected and approved in writing by Departmental Representative before commencement of the work.

.2 Placing:

- .1 Construct granular base to depth and grade in areas indicated.
- .2 Ensure no frozen material is placed.
- .3 Place material only on clean unfrozen surface, free from snow and ice.
- .4 Place material using methods which do not lead to segregation or degradation of aggregate.
- .5 For spreading and shaping material, use spreader boxes having adjustable templates or screeds which will place material in uniform layers of required thickness.
- .6 Place material to full width in uniform layers not exceeding 150 mm compacted thickness.
  - .1 Departmental Representative may authorize thicker lifts (layers) if specified compaction can be achieved.
- .7 Shape each layer to smooth contour and compact to specified density before succeeding layer is placed.

.3 Compaction Equipment:

- .1 Ensure compaction equipment is capable of obtaining required material densities.

.4 Compacting:

- .1 Compact to density not less than 100% of maximum dry density in accordance with ASTM D1557.
- .2 Shape and roll alternately to obtain smooth, even and uniformly compacted base.
- .3 Apply water as necessary during compacting to obtain specified density.
- .4 In areas not accessible to rolling equipment, compact to specified density with mechanical tampers approved in writing by Departmental Representative.

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

3.3 SITE TOLERANCES

.1 Finished base surface (base and sub-base) to be within plus or minus 10 mm of established grade and cross section but not uniformly high or low.

3.4 CLEANING

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

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

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

3.5 PROTECTION

.1 Maintain finished base in condition conforming to this Section until succeeding material is applied.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

.1 Measure asphalt concrete paving in (metric) tonnes of asphalt concrete actually incorporated into Work. The binder is included in the price of the asphalt concrete paving. The supply and placement of treated wooden planks around the perimeter of the paving surfaces are also included in the bid price. The price includes supply, laying, compaction, installation and any incidental expense.

1.2 REFERENCES

.1 American Association of State Highway and Transportation Officials (AASHTO)

.1 AASHTO M320-10, Standard Specification for Performance Graded Asphalt Binder.

.2 AASHTO R29-02, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.

.1 Ministère des Transports du Québec (MTQ, Quebec Ministry of Transport)

.1 4202 Hot mix asphalt formulated using the MTQ Road Laboratory method.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate. Product literature must include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C, four (4) weeks prior to beginning Work.

.3 Test and Evaluation Reports:

.1 Submit manufacturer's test data and certification that the bituminous binder proposed meets specification requirements.

.2 Submit manufacturer's test data and certification that hydrated lime meets specified requirements.

.3 Submit asphalt concrete mix design and trial mix test results to Departmental Representative for review at least 4 weeks prior to beginning Work.

.4 Submit printed record of mix temperatures at end of each day.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 – Common Product Requirements and manufacturer's written instructions.

Part 2 Products

2.1 MATERIALS

.1 Performance graded bituminous binder: to AASHTO M320, grade PG 58-28 when tested to AASHTO R29.

.2 Asphalt paving: ESG-14 type, coarse granular base type 3C, fine granular mix type 2, to MTQ standard 4202.

.3

2.2 EQUIPMENT

.1 Pavers: mechanical grade controlled self-powered pavers capable of spreading mix within specified tolerances, true to line, grade and crown indicated.

.2 Rollers: sufficient number of type and weight to obtain specified density of compacted mix.

.3 Haul trucks: sufficient number and of adequate size, speed and condition to ensure orderly and continuous operation and as follows:

.1 Boxes with tight metal bottoms.

.2 Covers of sufficient size and weight to completely cover and protect asphalt mix when truck fully loaded.

.3 In cool weather or for long hauls, insulate entire contact area of each truck box.

.4 Use only trucks which can be weighed in single operation on scales supplied.

.4 Hand tools:

.1 Lutes or rakes with covered teeth for spreading and finishing operations.

.2 Tamping irons having mass 12 kg minimum and bearing area not exceeding 310 cm^2 for compacting material along curbs, gutters and other structures inaccessible to roller. Mechanical compaction equipment, when approved by Departement Representative, may be used instead of tamping irons.

.3 Use straight edges, 4.5 m in length, to test finished surface.

2.3 MIX DESIGN

.1 Mix design to be approved in writing by Departmental Representative.

.1 Do not change job-mix without prior approval of Departmental Representative. When change in material source proposed, new job-mix formula to be approved by Departmental Representative.

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for asphalt paving in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 TRANSPORTATION OF MIX

.1 Transport mix to job site in vehicles cleaned of foreign material.

.2 Paint or spray truck beds with limewater, soap or detergent solution, or non-petroleum based commercial product, at least daily or as required.

.1 Raise truck bed and thoroughly drain, and ensure no excess solution remains in truck bed.

.3 Deposit mix from surge or storage silo to trucks in multiple drops to reduce segregation.

.1 Do not dribble mix into trucks.

.4 Deliver material to paver at uniform rate and in an amount within capacity of paving and compacting equipment.

.5 Deliver loads continuously in covered vehicles and immediately spread and compact.

.1 Deliver and place mixes at temperature within range as directed by Departmental Representative, but not less than 135 degrees C.

3.3 PLACING

.1 Obtain Departmental Representative's approval of existing surface prior to placing asphalt.

.2 The surface grade must correspond to the existing grade. However, it must improve diversion of the flow of storm water as prescribed in the following section.

.3 Contractor responsible for ensuring that asphalt pavement is graded to ensure proper drainage of the new roadway down to the details of the concrete surface drainage system; refer to plan for details.

.4 Place asphalt concrete to thicknesses, grades and lines indicated on the drawings.

.5 Placing conditions:

.1 Place asphalt mixtures only when air temperature is 5 degrees C minimum.

.2 When temperature of surface on which material is to be placed falls below 10 degrees C, provide extra rollers as necessary to obtain required compaction before cooling.

.3 Do not place hot-mix asphalt when pools of standing water exist on surface to be paved, during rain, or when surface is damp.

3.4 COMPACTING

.1 Roll asphalt continuously using established rolling pattern for test strip and to density of not less than 100% of maximum density determined for test strip.

.2 General:

.1 Start rolling operations as soon as placed mix can bear weight of roller without excess displacement of material or cracking of surface.

.2 For lifts 50 mm thick and greater, adjust speed and vibration frequency of vibratory rollers to produce minimum of 25 impacts per metre of travel. For lifts less than 50 mm thick, impact spacing not to exceed compacted lift thickness.

.3 Overlap successive passes of roller by minimum of 200 mm and vary pass lengths.

.4 Keep wheels of roller slightly moistened with water to prevent pick-up of material but do not over-water.

.5 Do not stop vibratory rollers on pavement that is being compacted with vibratory mechanism operating.

.6 Do not permit heavy equipment or rollers to stand on finished surface before it has been compacted and has thoroughly cooled.

.7 After traverse and longitudinal joints and outside edge have been compacted, start rolling longitudinally at low side and progress to high side.

.1 Ensure that all points across width of pavement receive essentially equal numbers of compactor passes.

.8 Where rolling causes displacement of material, loosen affected areas at once with lutes or shovels and restore to original grade of loose material before re-rolling.

.3 Breakdown rolling:

.1 Begin breakdown rolling with static steel wheeled roller or vibratory roller immediately following rolling of transverse and longitudinal joint and edges.

.2 Operate rollers as close to paver as necessary to obtain adequate density without causing undue displacement.

.3 Operate breakdown roller with drive roll or wheel nearest finishing machine.

.4 Use only experienced roller operators.

.4 Intermediate rolling:

.1 Use pneumatic-tired, steel wheel or vibratory rollers and follow breakdown rolling as closely as possible and while paving mix temperature allows maximum density from this operation.

.2 Rolling to be continuous after initial rolling until mix placed has been thoroughly compacted.

.5 Finish rolling:

.1 Accomplish finish rolling with two-axle or three-axle tandem steel wheeled rollers while material is still warm enough for removal of roller marks.

.1 If necessary to obtain desired surface finish, use pneumatic-tired rollers as directed by Departmental Representative.

.2 Conduct rolling operations in close sequence.

3.5 JOINTS

3.6 FINISH TOLERANCES

.1 Finished asphalt surface to be within 5 mm of design elevation but not uniformly high or low.

.2 Finished asphalt surface not to have irregularities exceeding 5 mm when checked with 4.5 m straight edge placed in any direction.

3.7 DEFECTIVE WORK

.1 Correct irregularities which develop before completion of rolling by loosening surface mix and removing or adding material as required.

.1 If irregularities or defects remain after final compaction, remove surface course promptly and lay new material to form true and even surface and compact immediately to specified density.

.2 Repair areas showing checking, rippling, or segregation.

.3 Adjust roller operation and screed settings on paver to prevent further defects such as rippling and checking of pavement.

3.8 CLEANING

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

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

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

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

.1 Preparation of sub-grade for placing topsoil will not be measured for payment.

.2 Supply and application of soil amendments, supply, placement and spreading of topsoil, and finish grading will not be measured for payment. These work elements will be included in the unit price for sodding.

1.2 REFERENCES

.1 Agriculture and Agri-Food Canada

.1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment

.1 PN1340-2005, Guidelines for Compost Quality.

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

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 DEFINITIONS

.1 Compost:

.1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.

.2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.

.3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below (25) (50)), and contain no toxic or growth inhibiting contaminates.

.4 Composted bio-solids to: CCME Guidelines for Compost Quality, Category (A) (B).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality control submittals:

.1 Soil testing: submit certified test reports showing compliance with specified performance characteristics and physical properties as described in PART 2 – SOURCE QUALITY CONTROL.

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

1.5 QUALITY ASSURANCE

.1 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 32 16 07 – Construction Progress Schedules – Bar (GANTT) Chart.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Divert unused soil amendments from landfill to official hazardous material collection site approved by Departmental Representative.

.2 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

Part 2 Products

2.1 TOPSOIL

.1 Topsoil for seeded areas: mixture of particulates, micro-organisms and organic matter which provides suitable medium for supporting intended plant growth.

.1 Soil texture based on the Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.

.2 Contain no toxic elements or growth inhibiting materials.

.3 Finished surface free of:

.1 Debris and stones over 50 mm diameter.

.2 Course vegetative material, 10 mm diameter and 100 mm length, occupying more than 2% of soil volume.

.4 Consistence: friable when moist.

2.2 SOIL AMENDMENTS

.1 Fertilizer:

.1 Fertility: major soil nutrients present in following amounts:

.2 Nitrogen (N): 20 to 40 micrograms of available N per gram of topsoil.

.3 Phosphorus (P): 40 to 50 micrograms of phosphate per gram of topsoil.

.4 Potassium (K): 75 to 110 micrograms of potassium per gram of topsoil.

.5 Calcium, magnesium, sulfur and micro-nutrients present in balanced ratios to support germination and/or establishment of intended vegetation.

.6 pH value: 6.5 to 8.0.

.2 Peatmoss:

.1 Derived from partially decomposed species of Sphagnum Mosses.

.2 Elastic and homogeneous, brown in colour.

.3 Free of wood and deleterious material which could prohibit growth.

.4 Shredded particles minimum size: 5 mm.

.3 Sand: washed coarse silica sand, medium to course textured.

.4 Organic matter: compost Category A in accordance with CCME PN1340, unprocessed organic matter, such as rotted manure, hay, straw, bark residue or sawdust, meeting the organic matter, stability and contaminant requirements.

.5 Limestone:

.1 Ground agricultural limestone.

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

.6 Fertilizer: industry accepted standard medium containing nitrogen, phosphorous, potassium and other micro-nutrients suitable to specific plant species or application or defined by soil test.

2.3 SOURCE QUALITY CONTROL

.1 Advise Departmental Representative of sources of topsoil to be utilized with sufficient lead time for testing.

.2 Contractor is responsible for amendments to supply topsoil as specified.

.3 Soil testing by recognized testing facility for pH, P and K, and organic matter.

.4 Testing of topsoil will be carried out by Contractor.

.1 Soil sampling, testing and analysis to be in accordance with provincial standards.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. These measures must conform to requirements of sediment and erosion control plan specific to site in compliance with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

3.2 STRIPPING OF TOPSOIL

.1 Begin topsoil stripping of areas agreed with Departmental Representative after area has been cleared of grasses and removed from site.

.2 Strip topsoil to depths as directed by Departmental Representative.

.1 Avoid mixing topsoil with subsoil where textural quality will be moved outside acceptable range of intended application.

.3 Stockpile in locations as directed by Departmental Representative.

.1 Stockpile height not to exceed 2 m.

.4 Disposal of unused topsoil is to be in an environmentally responsible manner but not used as landfill, as directed by Departmental Representative.

.5 Protect stockpiles from contamination and compaction.

3.3 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.

.1 If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

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

.3 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials.

.1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.

.2 Remove debris which protrudes more than 75 mm above surface.

.3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100 mm.

.1 Cross-cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.4 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

.1 Place topsoil after Departmental Representative has accepted subgrade.

.2 For sodded areas keep topsoil 15 mm below finished grade.

.3 Spread topsoil as indicated to following minimum depths after settlement.

.1 135 mm for sodded areas.

.4 Manually spread topsoil/planting soil around trees, shrubs and obstacles.

3.5 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.

.1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.

.1 Leave surfaces smooth, uniform and firm against deep footprinting.

3.6 ACCEPTANCE

.1 Departmental Representative will inspect and test topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.7 SURPLUS MATERIAL

.1 Dispose of materials not required, except topsoil, off site.

3.8 CLEANING

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 MEASUREMENT AND PAYMENT

.1 Payment for sodding will be made at unit price bid of actual area surface measurements taken and computed by Departmental Representative for:

.1 Commercial grade turf grass nursery sod per square metre.

The supply, placement, amendment and topsoil levelling required as described in Section 32 91 19 13 will be included in the unit price bid for sodding in the price schedule.

1.2 REFERENCES

.1 Bureau de Normalisation du Québec (Quebec Standards Office)

.1 NQ 0605-300 Produits de pépinières et de gazon.

1.3 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling:

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

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

.3 Pre-installation meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 31 19 – Project Meetings.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer’s instructions, printed product literature and data sheets for sod, geotextile and fertilizer. Product documentation must include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies of WHMIS MSDS in accordance with Section 01 35 29 06 – Health and Safety Requirements.

.3 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements of seed mix, seed purity, and sod quality.

.4 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties of seed mix, seed purity, and sod quality.

1.5 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store materials in accordance with supplier's recommendations.

.2 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

.1 Number one turf grass nursery sod: sod that has been specially sown and cultivated in nursery fields as turf grass crop.

.1 Turf grass nursery sod types:

.1 Number One Kentucky Bluegrass Sod: nursery sod grown solely from seed of cultivars of Kentucky Bluegrass, containing not less than 50% Kentucky Bluegrass cultivars.

.2 Number One Named Cultivars: Nursery Sod grown from certified seed.

.2 Turf Grass Nursery Sod quality:

.1 Not more than 1 broadleaf weed and up to 1% native grasses per 40 square metres.

.2 Density of sod sufficient so that no soil is visible from height of 1500 mm when mown to height of 50 mm.

.3 Mowing height limit: 35 to 65 mm.

.4 Soil portion of sod: 6 to 15 mm in thickness.

.2 Sod establishment support:

.1 Geotextile fabric: biodegradable, square mesh.

.2 Wooden pegs: 17 x 8 x 200 mm.

.3 Biodegradable starch pegs: 17 x 8 x 200 mm.

.3 Water:

.1 Supplied by Departmental Representative at designated location.

.4 Fertilizer:

.1 To Canada Fertilizers Act and Fertilizers Regulations.

.2 Complete, synthetic, slow release with 65% of nitrogen content in water-insoluble form.

2.2 SOURCE QUALITY CONTROL

.1 Obtain written approval from Departmental Representative of sod at source.

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

Part 3 Execution

3.1 EXAMINATION

.1 Verification of conditions: verify that conditions of substrate previously installed under other sections or contracts are acceptable for sod installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative.

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 PREPARATION

.1 Verify that grades are correct and prepared in accordance with Section 32 91 19 13 – Topsoil Placement and Grading. If discrepancies occur, notify Departmental Representative and do not commence work until instructed by Departmental Representative.

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

.3 Fine grade surface free of humps and hollows to smooth, even grade, elevations indicated to tolerance of plus or minus 15 mm, surface draining naturally.

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

3.3 SOD PLACEMENT

.1 Ensure sod placement is done under supervision of certified Landscape Planting Supervisor.

.2 Lay sod within 24 hours of being lifted if air temperature exceeds 20 degrees C.

.3 Lay sod sections in rows, joints staggered. Butt sections closely without overlapping or leaving gaps between sections. Cut out irregular or thin sections with sharp implements.

.4 Roll sod as directed by Departmental Representative. Provide close contact between sod and soil by light rolling. Use of heavy roller to correct irregularities in grade is not permitted.

3.4 CLEANING

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

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

.2 Keep pavement and area adjacent to site clean and free of mud, dirt, and debris at all times.

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

.1 Clean and reinstate areas affected by Work.

3.5 PROTECTION BARRIERS

.1 Protect newly sodded areas from deterioration with snow fence on rigid frame as directed by Departmental Representative.

.2 Remove protection 2 weeks after installation following inspection as directed by Departmental Representative.

3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Perform following operations from time of installation until acceptance.

.1 Water sodded areas in sufficient quantities and at frequency required to maintain optimum soil moisture condition to depth of 75 to 100 mm.

.2 Cut grass to 50 mm when or before it reaches a height of 75 mm.

.3 Maintain sodded areas weed free 95%.

.4 Fertilize sodded areas in accordance with supplier’s recommendations. Spread half of required amount of fertilizer in one direction and remainder at right angles, and water in well.

.5 Temporary barriers or signage to be maintained where required to protect newly established sod.

3.7 ACCEPTANCE

.1 Turf Grass Nursery Sod areas will be accepted by Departmental Representative provided that:

.1 Sodded areas are properly established.

.2 Sod is free of bare and dead spots.

.3 No surface soil is visible from height of 1500 mm when grass has been cut to height of 50 mm.

.4 Sodded areas have been cut minimum 2 times prior to acceptance.

.2 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

.3 When environmental conditions allow, all sodded areas showing shrinkage cracks shall be top-dressed and seeded with a seed mix matching the original.

.4 Areas sodded in fall will be accepted in following spring one month after start of growing season provided acceptance conditions are fulfilled.

3.8 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:

.1 Water sodded Turf Grass Nursery Sod areas at weekly intervals to obtain optimum soil moisture conditions to depth of 100 mm.

.2 Repair and resod dead or bare spots to satisfaction of Departmental Representative.

.3 Cut grass and remove clippings that will smother grass as directed by Departmental Representative to height as follows:

.1 Turf Grass Nursery Sod:

.1 Cut to 50 mm during normal growing conditions.

.2 Cut grass at 2 week intervals or as directed by Departmental Representative, but at intervals so that approximately one third of growth is removed in single cut.

.3 Eliminate weeds by mechanical means to extent acceptable to Departmental Representative.

END OF SECTION