



PUBLIC WORKS AND GOVERNMENT
SERVICES CANADA

PRESCOTT GATE REPAIR

TECHNICAL SPECIFICATIONS

PROJECT No. R.077899.001

SR4 – FOR TENDER

DO NOT USE THIS DOCUMENT FOR CONSTRUCTION PURPOSE.

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A circular professional seal for Marie-Ève Hinse Ouellet, a Professional Engineer in Quebec. The seal contains the text 'PROFESSIONAL ENGINEER', 'Marie-Ève Hinse Ouellet', and the number '1007559'. Above the seal is a handwritten signature, and below it is the date '31/08/2015'.

Quebec, August 31st, 2015

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Part 1 - GENERAL**1.1 Work covered by contract documents**

- .1 Work of this Contract comprises:
 - .1 Concrete repairs.
 - .2 Remaking of veneers.
 - .3 Repair of the apron (watertightness and decking).

1.2 Timeline for completing

- .1 Works to be completed by June 30th, 2016.
- .2 In order to meet project deadlines, the Contractor shall provide and pay for any temporary protection and heating of work.

1.3 Contractor use of premises

- .1 Contractor is granted unrestricted use of the work site until Substantial Performance.
- .2 Co-ordinate use of premises under direction of Departmental and Quebec City Representatives.

1.4 Existing services

- .1 Notify, Departmental Representative and utility companies of intended interruption of services and obtain required permission.
- .2 Foresee alternative routes and provide road signs in the vicinity of work site for personnel, pedestrian and vehicular traffic.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .4 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.
- .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 (Temporary Barriers and Enclosures).

1.5 Documents required

- .1 Maintain at job site, one copy of 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.

1.6 Events

- .1 Work site continuity may be altered by public events such as:
 - .1 Fête nationale – June 23th, 2016;
 - .2 Canada Day;
 - .3 Tour de Beauce (cycling) – June 18th, 2016;
 - .4 Grand Prix Cycliste (cycling);
 - .5 Défis des escaliers (stairs challenge).
- .2 It is the Contractor's responsibility to seek and obtain all the relevant information from the authorities having jurisdiction (date, duration, impacts, etc.).

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 Access and egress**

- .1 Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations.

1.2 Use of site and facilities

- .1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .2 Maintain existing services to building and provide for personnel and vehicle access.
- .3 Where security is reduced by work provide temporary means to maintain security.
- .4 Closures: protect work temporarily until permanent enclosures are completed.
- .5 No storage space is available or allowed on the worksite.

1.3 Special requirements

- .1 Unless otherwise indicated, available traffic width should be at least 5 m on Côte de la Montagne, free of any obstructions at all times.
- .2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .3 Keep within limits of work and avenues of ingress and egress.
- .4 The Contractor shall allow the City of Quebec to make municipal repair work within the site, all in a coordinated manner between parties concerned.
- .5 Access to Montmorency Park will be permitted only within the footprint of the stairs to be repaired at the time of repair.
- .6 Facilities must not impinge on the neighbouring properties.
- .7 The Contractor shall maintain a safe access to the public stairs and neighbouring shops at all times.

1.4 Security

- .1 Where security has been reduced by Work of Contract, provide temporary means to maintain security.

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 Unit or lump sum price**

- .1 The total contract amount is broken down as follows:
 - .1 Description of lump sum price work.
 - .2 Description of unit price work.
- .2 Each of the broken down unit or lump sum prices should include all expenses, all work, disbursements, payments, direct or indirect costs, mobilization and demobilization; Contractor's actions and deeds, and all liabilities, obligations, omissions and errors related to the performance of this Work. These prices also include the transportation and roll-out of materials, as well as all the costs of doing business: administration, insurance, contributions, interest, rent, taxes and other incidental expenses. Prices must cover the losses and damages resulting from the nature of the work, the fluctuation of prices and wages, business risks, strikes, delays not caused by the Departmental Representative, restrictions on transport, accidents and the action of natural forces.

1.2 Definitions

- .1 Lump sum price: work is globally determined with accuracy and in detail.
- .2 Unit price: work specifications are determined accurately and in detail and all quantities on the bid form are estimates.

1.3 Description of items in the lump sum price schedule

- .1 Item 1 - Site layout:
 - .1 This item includes signage and temporary traffic lights, flaggers, bypass lanes (if required), construction trailers, relocating traffic signs, dust abatement, protection of existing utilities, all the elements described in this section and all requirements described in Division 1 (General Requirements) of this Specification. This item finally includes all other work not included in other items of the bid form.
 - .2 Payment of this item to be made as follows:
 - .1 25% with the first monthly payment;
 - .2 50% evenly distributed among payments of subsequent steps;
 - .3 25% with the payment at issuance of the "Certificate of substantial (provisional) completion".
- .2 Item 2 – Excavation and backfilling: this item includes all the work involved with excavation as shown on the drawings, removal of existing surface course in excavation zones, required saw cuts, installation and removal of false works, dewatering and drainage of excavation bottoms, as well as backfilling with specified materials.
- .3 Item 3 – Concrete repair:
 - .1 Item 3a) includes all work related to surface repair of concrete where specified, and any incidental expense.

- .4 Item 4 - Masonry work:
 - .1 Item 4a) includes the work described in section 04 03 06 (Historic – Cleaning Historic Masonry) of this Specification; the supply of cleaning equipment and products, supply of protection measures and for recovery of residues, cleaning, and any incidental expense.
 - .2 Item 4b) includes raking the masonry joints, jointing and finishing in stages, the supply of equipment, materials and labour. Cost of work to include the cleaning of surfaces as required, fabrication of samples and protection of the structures during the curing period and any incidental expense.
- .5 Item 5 – Waterproofing: this item includes the removal of all existing waterproofing systems on top of the Gate apron (i.e., membranes and flashing), the preparation of surfaces and the installation of new waterproofing systems as required in this Specification and to manufacturers' recommendations. This item also includes costs for the restoration of waterproofing systems at the foot of walls and where masonry repairs are foreseen.
- .6 Item 6 – Water-repellent coating: this item includes required preparation of substrates and application of water repellent.
- .7 Item 7 – Replacement of planks: this item includes the removal of existing wooden elements (decking, floor furring and steps) and their anchors; the supply, preparation and installation of new decking elements, floor furring and steps as well as new anchors and all related work.
- .8 Item 8 – Removal of corroded steel and replacement of steel elements: this item includes the removal of corroded sections of metal decking, cleaning of the door's interior space, removal and replacement of angle sections and of steel bolts and nuts, as well as any incidental expense.
- .9 Item 9 – Miscellaneous construction work: this item includes the costs related to the dismantling and reconstruction of existing features such as sidewalks and curbs, toe walls, guard rails, urban furnishings and equipment, signalling and any other elements that should be moved or removed to perform the work as specified.
- .10 Item 10 – Scaffolding and false works: this item includes the installation of required scaffolding and other protection systems required to perform the Work; the engineering design and the installation of retaining and shoring structures and any other incidental expense.

1.4 Description of items in the schedule of included unit prices

- .1 Item 1 – Replacement of limestone veneer units: this item to be paid per square metre (m²) of replaced stone surface area. Unit price to include the removal of identified stones, disposal off site of non-reusable materials, measuring the stones to be replaced, preparation of shop drawings, fabrication of samples, supply and placement of new stones with their anchors, repointing at the periphery of newly installed stones, as well as any other incidental expense.
- .2 Item 2 – Replacement of granite veneer stones: this item paid as unit price item, that is, the number of replaced stones. The unit price should include the removal of identified stones, disposal off site of non-reusable materials, measuring the stones to be replaced, preparation of shop drawings, fabrication of samples, supply and placement of new stones with their anchors, repointing at the periphery of newly installed stones, as well as any other incidental expense.

- .3 Item 3 – Replacement of coping stones: this item paid as unit price item, that is, the number of replaced stones. The unit price should include the removal of identified stones, disposal off site of non-reusable materials, measuring the stones to be replaced, preparation of shop drawings, fabrication of samples, supply and placement of new stones with their anchors, repointing at the periphery of newly installed stones, as well as any other incidental expense.
- .4 Item 4 – Dismantling and reinstallation of veneer stones: this item paid per square metre (m²) surface area of dismantled and reconstructed veneer. Includes the raking of mortar joints in the dismantled zone; marking of the veneer stones, their removal and stowage as specified, removal of anchors fastened in concrete or in the stones being removed, removal of mortar on the stones, installation of specified stone with their anchors and mortar, and repointing of surfaces. Cost of this item to include protection of the Work during the curing period and any other incidental expense.
- .5 Item 5 - In-depth repair of concrete: this item to be paid per square metre (m²) surface area of dismantled and reconstructed concrete. Bear in mind on average a 100 mm thickness of repair concrete. The supply and installation of formwork and any incidental expenditure related to in-depth work is also included in this item.

1.5 Substantial completion of work

- .1 At substantial completion of work, prepare and submit to Departmental Representative a comprehensive list of items to be completed or corrected and apply for a field review of Work by Departmental Representative to establish substantial completion. Failure to include items on list does not alter Contractor's responsibility to complete the Contract.
- .2 No later than ten (10) days after receipt of list and application, the Departmental Representative will review Work to verify validity of application, and no later than seven (7) days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.
- .3 Departmental Representative will state date of Substantial Performance of Work or designated portion of Work in certificate.
- .4 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Departmental Representative, establish reasonable date for finishing Work.

1.6 Payment of holdback upon substantial performance of work

- .1 Proceed as follows after issuance of certificate of Substantial Performance of Work:
 - .1 Submit application for payment of holdback amount.
 - .2 Submit sworn statement that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.
- .2 After receipt of application for payment and sworn statement, Departmental Representative will issue certificate for payment of holdback amount.

1.7 Final payment

- .1 Contractor to submit application for final payment when Work is completed.
- .2 Departmental Representative will, no later than ten (10) days after receipt of application for final payment, review Work to verify validity of application. Departmental Representative will give notification that application is valid or give reasons why it is not valid, no later than seven (7) days after reviewing Work.
- .3 Departmental Representative will issue final certificate for payment when application for final payment is found valid.

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 Particular requirements for inspection and testing to be carried out by testing laboratory designated by Departmental Representative are specified under various sections.

1.2 Appointment and payment

- .1 Departmental Representative will appoint and pay for services of testing laboratory except follows:
 - .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 the supervision of Departmental Representative.
 - .5 Additional tests specified as follows:
- .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 Provide labour, equipment 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 Provide Departmental Representative with advance notification (48 hours) 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 at no cost to Departmental Representative.
- .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 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): 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 Chart (GANTT) 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 Submit to Departmental Representative within 5 working days of notice of acceptance of bid, a Bar Chart (GANTT) as Master Plan for planning, monitoring and reporting of project progress.

- .2 Submit Project Schedule to Departmental Representative within 5 working days of receipt of acceptance of Master Plan.

1.4 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.

1.5 Project schedule

- .1 Develop detailed Project Schedule derived from Master Plan; do so for each of the construction phases.
- .2 Establish schedule in view of timelines for completing the project indicated in Section 01 11 00 (Summary of Work), and the work restriction dates specified in Section 01 14 00 (Work Restrictions).
- .3 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows, and distinctly for the three structures, i.e., Montcalm bastion, Montcalm wall and de la Canoterie wall:
 - .1 Award;
 - .2 Mobilization;
 - .3 Shop Drawings, Samples;
 - .4 Excavation;
 - .5 Masonry work;
 - .6 Concreting;
 - .7 Backfill;
 - .8 Improvements;
 - .9 Correction of deficiencies;
 - .10 Final acceptance.

1.6 Project schedule reporting

- .1 Update Project Schedule on a weekly basis or prior to every site meeting in order to reflect 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.

1.7 Job site 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 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 submission of complete and accurate documents and samples to requirements of Contract Documents is not relieved by Departmental Representative's review of submittals.
- .9 Keep one reviewed copy of each submission on site.

1.2 Shop drawings and product data

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of Québec.
- .3 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.
- .4 Allow 10 days for Departmental Representative's review of each submission.
- .5 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.
- .6 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.

- .7 Accompany submissions with transmittal letter containing:
 - .1 Date;
 - .2 Project title and number;
 - .3 Contractor's name and address;
 - .4 Identification and quantity of each shop drawing, product data and sample;
 - .5 Other pertinent data.
- .8 Submissions include:
 - .1 Date and revision dates;
 - .2 Project title and number;
 - .3 Name and address of:
 - .1 Subcontractor
 - .2 Supplier
 - .3 Manufacturer
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents;
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances
 - .3 Setting or erection details
 - .4 Relationship to adjacent work
- .9 After Departmental Representative's review, distribute copies.
- .10 Submit 2 copies of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
- .11 Submit 2 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.
- .12 Submit 2 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 2 years of date of contract award for project.
- .13 Submit 2 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.
- .14 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.

1.3 Samples

- .1 Submit for review samples in 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 are not intended to change 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.

1.4 Mock-ups

- .1 Erect mock-ups in accordance with Section 01 45 00 (Quality Control).

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 When working on travelled way:
 - .1 Place equipment in position to present minimum of interference and hazard to travelling public.
 - .2 Keep equipment units as close together as working conditions permit and preferably on same side of travelled way.
 - .3 Do not leave equipment on travelled way overnight.
- .3 Do not close any roadways without approval by the City of Québec. Before re-routing traffic erect suitable signage in accordance with applicable regulations. Early in the project, the Contractor shall take the necessary measures prepare the site.
- .4 Keep travelled way graded, free of pot holes and minimum 5 m in width (or as indicated).
- .5 Ensure at all times safe pedestrian traffic on existing or temporary sidewalks provided.

1.2 Informational and warning devices

- .1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 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.
- .3 Continually maintain traffic control devices in use by:
 - .1 Checking signs daily for legibility, damage, suitability and location. Clean, repair or replace to ensure clarity and reflectance.
 - .2 Removing or covering signs which do not apply to conditions existing from day to day.

1.3 Control of public traffic

- .1 In the following situations, provide competent flag persons, properly trained and equipped as specified in the applicable regulations and standards:
 - .1 When public traffic is required to pass working vehicles or equipment that block all or part of travelled roadway.
 - .2 When it is necessary to institute one-way traffic system through construction area or other blockage where traffic volumes are heavy, approach speeds are high and traffic signal system is not in use.
 - .3 When workmen or equipment are employed on travelled way over brow of hills, around sharp curves or at other locations where oncoming traffic would not otherwise have adequate warning.

- .4 Where temporary protection is required while other traffic control devices are being erected or taken down.
- .5 For emergency protection when other traffic control devices are not readily available.
- .6 In situations where complete protection for workers, working equipment and public traffic is not provided by other traffic control devices.
- .7 Delays to public traffic due to contractor's operators: maximum 15 minutes following approval by the relevant authorities.

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 Section includes**

- .1 Contractor shall manage his operations so that safety and security of the public and of site workers always take precedence over cost and scheduling considerations.

1.2 References

- .1 Canada Labour Code - Part II, Canadian Occupational Safety and Health Regulations.
- .2 Canadian Standards Association (CSA).
- .3 Workplace Hazardous Materials Information System (WHMIS).
- .4 Act Respecting Occupational Health and Safety, R.S.Q. Chapter S-2.1.
- .5 Construction Safety Code, S-2.1, r.4.

1.3 Submittals

- .1 Submit the documents required according to Section 01 33 00 (Documents and samples to be submitted).
- .2 Submit to Departmental Representative, the CSST and the *Association paritaire en santé et sécurité du secteur de la construction* (ASP Construction) the site-specific safety program, as outlined in 1.8 at least 10 days prior to start of work. The Contractor must review his program during the course of the project if any change occurs in work methods or site conditions. The Departmental Representative may, after receiving the program or at any time during the project, ask the Contractor to update or modify the program in order to better reflect the reality of the construction site and activities. The Contractor must make the required changes before work begins.
- .3 Submit to Departmental Representative the site inspection sheet, duly completed, at the intervals indicated in 1.13.1.
- .4 Submit to Departmental Representative within 24 hours a copy of any inspection report, correction notice or recommendation issued by federal or provincial inspectors.
- .5 Submit to Departmental Representative within 24 hours an investigation report for any accident involving injury and any incident exposing a potential hazard.
- .6 Submit to Departmental Representative all safety data sheets for hazardous material to be used at the site at least three days before they are to be used.
- .7 Submit to Departmental Representative copies of all training certificates required for application of the safety program, in particular:
 - .1 General construction site safety and health courses;
 - .2 Safety officer attestations;
 - .3 First aid in the workplace and cardiopulmonary resuscitation;
 - .4 Work in confined spaces;
 - .5 Lockout procedures;
 - .6 Wearing and fitting of individual protective gear;
 - .7 forklift truck;

- .8 positioning platform;
- .9 Any other requirement of Regulations or the safety program.
- .8 Emergency plan : The emergency plan, as defined in 1.8.3, shall be submitted to Departmental Representative at the same time as the site-specific safety program.
- .9 Notice of site opening : Notice of site opening shall be submitted to the *Commission de la santé et de la sécurité du travail* before work begins. A copy of such notice shall be submitted to Departmental Representative at the same time and another posted in full view at the site. During demobilization, a notice of site closing shall be submitted to the CSST, with copy to Departmental Representative.
- .10 Plans and certificates of compliance : Submit to the CSST and to Departmental Representative a copy signed and sealed by engineer of all plans and certificates of compliance required pursuant to the Construction Safety Code (S-2.1, r. 6), or by any other legislation or regulation or by any other clause in the specifications or in this contract. Copies of these documents must be on hand at the site at all times.
- .11 Certificate of compliance delivered by the CSST: The certificate of compliance is a document delivered by the CSST confirming that the contractor is in rule with the CSST, i.e. that he had pay out all the benefits concerning this contract. This document must be delivered to Departmental Representative at the end of the work.

1.4 Hazards assessment

- .1 The contractor must identify all hazards inherent in each task to be carried out at the site.
- .2 The contractor must plan and organize work so as to eliminate hazards at source or promote mutual protection so that reliance on individual protective gear can be kept to a minimum. Where individual protection against falling is required, workers shall use safety harness that meets standard Can - CSA- Z-259.10 - M90. Safety belts shall not be used as protection against falling.
- .3 Equipment, tools and protective gear which cannot be installed, fitted or used without compromising the health or safety of workers or the public shall be deemed inadequate for the work to be executed.
- .4 All mechanical equipment shall be inspected before delivery to the site. Before using any mechanical equipment, submit to Departmental Representative a certificate of compliance signed by a qualified mechanic. Whenever he suspects a defect or accident risk, Departmental Representative may at any time order the immediate shut-down of equipment and require a new inspection by a specialist of his own choosing.
- .5 For use of equipment for lifting persons or materials, ensure that the inspections required by the standards are met and be able to provide a copy of certificates of inspection upon request of Representative of the Ministry.

1.5 Meetings

- .1 Contractor decisional representative must attend any meetings at which site safety and health issues are to be discussed
- .2 Set up a site safety committee, and convene meetings every in accordance with the Construction Safety Code (S-2.1, r.4).

1.6 Legal and regulatory requirements

- .1 Comply with all legislation, regulations and standards applicable to the site and its related activities.

- .2 Comply with specified standards and regulations to ensure safe operations at site containing hazardous or toxic materials.
- .3 Regardless of the publication date shown in the construction safety code, always use the most recent version.

1.7 Site-specific conditions

- .1 At the site, the contractor must take account of the following specific conditions:
 - .1 Urban environment;
 - .2 Residential area.

1.8 Safety and health management

- .1 Acknowledge and assume all the tasks and obligations which customarily devolve upon a principal Contractor under the terms of the Act Respecting Occupational Health and Safety (R.S.Q., chapter S-2.1) and the Construction Safety Code (S-2.1, r.4).
- .2 Develop a site-specific safety program based on the hazards identified and apply it from the start of project work until close-out is completed. The safety program must take account of all information appearing in 1.7 and must be submitted to all parties concerned, in accordance with the provisions set forth in 1.3. At a minimum, the site-specific safety program must include :
 - .1 Company safety and health policy.
 - .2 A description of the work, total costs, schedule and projected workforce curve.
 - .3 Flow chart of safety and health responsibility.
 - .4 The physical and material layout of the site.
 - .5 First-aid and first-line treatment standards.
 - .6 Identification of site-specific hazards.
 - .7 Risk assessment for the tasks to be carried out, including preventive measures and the procedures for applying them.
 - .8 Training requirements.
 - .9 Procedures in case of accident/injury
 - .10 Written commitment from all parties to comply with the prevention program.
 - .11 A site inspection schedule based on the preventive measures.
- .3 The contractor must draw up an effective emergency plan based on the characteristics and constraints of the site and its surroundings. Submit the emergency plan to all parties concerned, pursuant to the provisions of 1.3. The emergency plan must include:
 - .1 Evacuation procedure;
 - .2 Identification of resources (police, firefighters, ambulance services, etc.);
 - .3 Identification of persons in charge at the site;
 - .4 Identification of those with first-aid training;
 - .5 Training required for those responsible for applying the plan;
 - .6 Any other information needed, in the light of the site characteristics.

1.9 Responsibilities

- .1 No matter the size of the construction site or how many workers are present at the workplace, designate a competent person to supervise and take responsibility for health and safety. Take all necessary measures to ensure the health and safety of persons and property at or in the immediate vicinity of the site and likely to be affected by any of the work.
- .2 Take all necessary measures to ensure application of and compliance with the safety and health requirements of the contract documents, applicable federal and provincial regulations and standards as well as the site-specific safety program, complying without delay with any order or correction notice issued by the Commission de la santé et de la sécurité du travail.
- .3 Take all necessary measures to keep the site clean and in good order throughout the course of the work.

1.10 Communications and posting

- .1 Make all necessary arrangements to ensure effective communication of safety and health information at the site. As they arrive on site, all workers must be informed of their rights and obligations pertaining to the site specific safety program. The Contractor must insist on their right to refuse to perform work which they feel may threaten their own health, safety or physical integrity or that of other persons at the site. The Contractor must keep and update a written record of all information transmitted with signatures of all affected workers.
- .2 The following information and documents must be posted in a location readily accessible to all workers:
 - .1 Notice of site opening;
 - .2 Identification of principal Contractor;
 - .3 Company OSH policy;
 - .4 Site-specific safety program;
 - .5 Emergency plan;
 - .6 Data sheets for all hazardous material used at the site;
 - .7 Minutes of site committee meetings;
 - .8 Names of site committee representatives;
 - .9 Names of those with first-aid training;
 - .10 Action reports and correction notices issued by the CSST.

1.11 Unforeseen circumstances

- .1 Whenever a source of danger not defined in the specifications or identified in the preliminary site inspection arises as a result of or in the course of the work, immediately suspend work, take appropriate temporary measures to protect the workers and the public and notify Departmental Representative, both verbally and in writing. Then the Contractor must modify or update the site specific safety program in order to resume work in safe conditions.

1.12 Health/safety/hygiene/environmental specialists

- .1 At the very outset of construction, hire a qualified person whose duties will be to ensure compliance with and application of all rules, regulations and standards and all contractual requirements.
- .2 Provide this person with the authority, resources and tools needed to perform his/her duties.
- .3 The person selected shall:
 - .1 Have in-depth knowledge of legislation and regulations applicable to the site.
 - .2 Develop and disseminate a safety orientation program for all site workers.
 - .3 Ensure that no worker is admitted to the site without having taken the safety orientation program and met all the training requirements of the applicable legislation and the site-specific safety program.
 - .4 Inspect the work and ensure compliance with all regulatory requirements and those of the contract documents or the site-specific safety program.
 - .5 Keep a daily log of actions taken and submitting a copy to Departmental Representative each week.

1.13 Inspection of site and correction of hazardous situations

- .1 Inspect the work site and complete the site inspection sheet at least once week.
- .2 Immediately take all necessary measures to correct any lapses from legislative or regulatory requirements and any hazards identified by a government inspector, by the Departmental Representative, by the site safety and health coordinator or during routine inspections.
- .3 Submit to Departmental Representative written confirmation of all measures taken to correct lapses and hazardous situations.
- .4 Give the safety officer or, where there is no safety officer, the person assigned to safety and health responsibilities, full authority to order interruption and resuming of work as and when deemed necessary or desirable in the interests of safety and health. This person should always act so that the safety and health of the public and site workers and environmental protection take precedence over cost and scheduling considerations.
- .5 Without limiting the scope of sections 1.8 and 1.9, Departmental Representative may order cessation of work if, in his/her view, there is any hazard or threat to the safety or health of site personnel or the public or to the environment.

1.14 Blasting

- .1 Blasting and other use of explosives are forbidden unless authorized in writing by Departmental Representative.

1.15 Powder actuated devices

- .1 Use of power hammers and other explosive-actuated devices must be authorized by Departmental Representative.
- .2 Any person using a power hammer shall hold a training certificate and meet all requirements of Section 7 of the Construction Safety Code (S-2.1, r. 6).
- .3 Any other explosive-actuated device shall be used in accordance with the manufacturer's directions and applicable standards and regulations.

Part 2 - PRODUCTS

2.1 Not used

.1 Not used.

Part 3 - EXECUTION

3.1 Not used

.1 Not used.

END OF SECTION

Part 1 - GENERAL**1.1 Definitions**

- .1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
- .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 Fires

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

1.3 Disposal of wastes

- .1 Do not bury on site rubbish and waste materials, which must be disposed of in appropriate landfill sites in accordance with section 01 74 21 (Construction/Demolition Waste Management and Disposal).

1.4 Drainage

- .1 Provide erosion control plan and indicate the control measures implemented, including monitoring and reporting requirements to assure that control measures are in compliance with Federal, Provincial, and Municipal laws and regulations.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sedimentations control plan.
- .3 Provide temporary drainage and pumping as necessary to keep excavations and site free from water.
- .4 Do not pump water containing suspended materials into waterways, sewer or drainage systems.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 Site clearing and plant protection

- .1 Protect trees and plants on site and adjacent properties where indicated.
- .2 Wrap in burlap, trees and shrubs adjacent to construction site, storage areas and truck lanes.
- .3 Protect roots of designated trees to dripline during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .4 Minimize stripping of topsoil and vegetation.

1.6 Pollution control

- .1 Maintain temporary erosion and pollution control features installed under this contract.
- .2 Control emissions from equipment and tools to local authorities emission requirements.
- .3 Prevent sanding dust and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris.
- .5 Remove dust daily on existing public roads that have been borrowed and muddied by the Contractor and subcontractors.

1.7 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.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

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 Inspection**

- .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 Independent inspection agencies

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
- .2 Provide equipment required for executing inspection and testing by appointed agencies.
- .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
- .4 If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Contractor shall correct defect and irregularities as advised by Departmental Representative at no extra cost. Pay costs for retesting and reinspection.

1.3 Access to work

- .1 Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
- .2 Co-operate to provide reasonable facilities for such access.

1.4 Procedures

- .1 Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.5 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 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 Construct in locations acceptable to Departmental Representative.
- .3 Prepare mock-ups for Departmental Representative review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 Mock-ups may remain as part of 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 Installation and removal**

- .1 Provide temporary utilities controls in order to execute work expeditiously.
- .2 Remove from site all such work after use.

1.2 Dewatering

- .1 Provide temporary drainage and pumping facilities to keep excavations and site free from standing water.

1.3 Water supply

- .1 Provide continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

1.4 Fuel supply

- .1 Do not keep fuel tanks on the construction areas.

1.5 Temporary heating and ventilation

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .3 Maintain temperatures of minimum 15 °C in areas where construction is in progress.
- .4 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
 - .4 Ventilate storage spaces containing hazardous or volatile materials.
 - .5 Ventilate temporary sanitary facilities.

- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .6 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.6 Temporary power and light

- .1 Provide and pay for temporary power during construction for temporary lighting and operating of power tools.
- .2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.7 Fire protection

- .1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.
- .2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 - PRODUCTS**2.1 Not used**

- .1 Not used.

Part 3 - EXECUTION**3.1 Not used**

- .1 Not used.

END OF SECTION

Part 1 - GENERAL**1.1 Installation and removal**

- .1 Follow indications on the layout drawing provided and prepare a site plan showing the proposed location and surface areas to be enclosed and used by the Contractor during construction, entrance and exit lanes to the fenced areas, and fencing details.
- .2 Indicate use of supplemental or other staging area.
- .3 Provide construction facilities in order to execute work expeditiously.
- .4 Remove from site all such work after use.
- .5 Any occupation of the roadway is under the Contractor's responsibility. The latter shall seek and obtain all the occupation permits from the authority having jurisdiction (the City of Québec).

1.2 Scaffolding

- .1 Scaffolding in accordance with CAN/CSA-S269.2.
- .2 Provide and maintain scaffolding, ramps, ladders, swing staging, platforms and temporary stairs.

1.3 Hoisting

- .1 Supply and install, maintain and operate hoists and cranes required for moving workers, materials and equipment; ensure the maintenance and operation. Take the necessary financial arrangements with subcontractors for their use of lifting equipment.
- .2 Hoists and cranes to be operated by qualified operators.

1.4 Construction parking

- .1 Parking will not be permitted on site.
- .2 Provide and maintain adequate access to project site.

1.5 Security

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

1.6 Offices

- .1 Provide office heated to 22 °C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table. Coordinate location with the City of Québec. Where no location is available, find and rent space near the work site.
- .2 Provide marked and fully stocked first-aid case in a readily available location.
- .3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.7 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.
- .3 No storage of materials (such as excavated material, backfill or masonry) is allowed on the work site. It is the Contractor's responsibility to find a suitable space for the storage and handling of these materials throughout the construction period.

1.8 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.

1.9 Construction signage

- .1 No signs indicating the names of the Contractor and consultants is permitted on the construction site.

1.10 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.

1.11 Temporary protection of the Work

- .1 Considering the timeframe allowed for completion of the work as well as the start and end of construction, the Contractor shall provide for the adequate protection of the structures under ambient conditions as indicated in the specifications.
- .2 This protection should allow performance of work until completion as well as curing under temperate and controlled ambient conditions.

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 Installation and removal**

- .1 Provide temporary controls in order to execute Work expeditiously.
- .2 Remove from site all such work after use.

1.2 Hoarding

- .1 Erected around work site a temporary steel fence, new, 2.4 m high, lined inside with a dust net. Installation to withstand wind pressures and any other weather conditions.
- .2 Provide lockable access gates for trucks and pedestrian gates as indicated and in accordance with traffic restrictions on adjacent streets. Provide locks and keys for the gates.
- .3 Erect where required and maintain pedestrian walkways including roof and side covers, complete with signs and electrical lighting as required by law. The enclosures must be designed to withstand weather conditions as specified in the applicable codes.

1.3 Guard rails and barricades

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

1.4 Dust tight screens

- .1 Provide dust screens to enclose the spaces where dust generating activities are conducted in order to protect workers, the public and the finished surfaces or work areas.
- .2 Maintain and relocate protection until such work is complete.

1.5 Access to site

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

1.6 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.

1.7 Fire routes

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

1.8 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.

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 Submittals: in accordance with Section 01 33 00 (Submittal Procedures).
- .2 Submit written request in advance of cutting or alteration which affects:
 - .1 Structural integrity of elements of project.
 - .2 Integrity of weather-exposed or moisture-resistant elements.
 - .3 Efficiency, maintenance, or safety of operational elements.
 - .4 Visual qualities of sight-exposed elements.
 - .5 Work of Owner or separate contractor.
- .3 Include in request:
 - .1 Identification of project.
 - .2 Location and description of affected Work.
 - .3 Statement on necessity for cutting or alteration.
 - .4 Description of proposed Work, and products to be used.
 - .5 Alternatives to cutting and patching.
 - .6 Effect on Work of Owner or separate contractor.
 - .7 Written permission of affected separate contractor.
 - .8 Date and time work will be executed.

1.2 Materials

- .1 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 of cutting or patching means acceptance of existing conditions.
- .4 Provide 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 cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Fit several parts together, to integrate with other Work.

- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .6 Cut materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.

Part 2 - PRODUCTS

2.1 Not used

- .1 Not used.

Part 3 - EXECUTION

3.1 Not used

- .1 Not used.

END OF SECTION

Part 1 - GENERAL**1.1 Project cleanliness**

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris.
- .2 Remove waste materials from site at daily regularly scheduled times.
- .3 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .4 Provide on-site containers for collection of waste materials and debris.
- .5 Dispose of waste materials and debris off site.
- .6 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .7 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .8 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.2 Final cleaning

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris.
- .5 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .7 Remove dirt (including rust stains) and other disfiguration from exterior surfaces.
- .8 Sweep and wash clean paved areas.

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 Plan and Goals.
- .2 Accomplish maximum control of solid construction waste.
- .3 Preserve environment and prevent pollution and environment damage.

1.2 Definitions

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Inert Fill: inert waste - exclusively asphalt and concrete.
- .3 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .4 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .5 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.
- .6 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.
- .7 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .8 Separate Condition: refers to waste sorted into individual types.
- .9 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.

1.3 Submittals

- .1 Submit before final payment summary of waste materials salvaged for reuse, recycling or disposal by project using deconstruction/disassembly material audit form.
 - .1 Failure to submit could result in hold back of final payment.
 - .2 Provide receipts, scale tickets, waybills, and show quantities and types of materials reused, recycled, co-mingled and separated off-site or disposed of.
 - .3 For each material reused, sold or recycled from project, include quantity in tonnes and the destination.
 - .4 For each material land filled or incinerated from project, include amount in tonnes of material and identity of landfill, incinerator or transfer station.

1.4 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 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.

1.5 Disposal of wastes

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil and paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins;
 - .2 Waste type of each bin;
 - .3 Total tonnage generated;
 - .4 Tonnage reused or recycled;
 - .5 Reused or recycled waste destination.
- .4 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

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 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
- .2 Clean-up work area as work progresses.
- .3 Source separate materials to be reused/recycled into specified sort areas.

END OF SECTION

Part 1 - GENERAL**1.1 Inspection and declaration**

- .1 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Departmental Representative Inspection.
- .2 Departmental Representative Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
- .3 Completion: submit written certificate that following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Work is complete and ready for final inspection.
- .4 Inspection or statement of final completion: when items noted above are completed, request final inspection of Work by Owner, Departmental Representative and Contractor. If Work is deemed incomplete by Owner and Departmental Representative, complete outstanding items and request reinspection.

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).
- .2 Provide evidence, if requested, for type, source and quality of products supplied.

1.2 As -built documents and samples

- .1 Maintain at site for Departmental Representative one record copy of:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Change Orders and other modifications to Contract.
 - .5 Reviewed shop drawings, product data, and samples.
 - .6 Field test records.
 - .7 Inspection certificates.
 - .8 Manufacturer's certificates.
- .2 Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
- .3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
- .4 Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
- .5 Keep record documents and samples available for inspection by Departmental Representative.

1.3 Recording information on project record documents

- .1 Record information on set of opaque drawings, provided by Departmental Representative.
- .2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.
- .3 Record information concurrently with construction progress. 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 buried elements.
 - .2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements;
 - .3 Field changes of dimension and detail;
 - .4 Changes made by change orders;

- .5 Details not on original Contract Drawings;
- .6 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 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.
- .7 Provide digital photos for site records, and namely with respect to the marking of existing stones.
- .8 At work completion, submit original copy of all construction worksite documents to Departmental Representative, annotated as specified.

1.4 Warranties and bonds

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.
- .3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
- .4 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
- .5 Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
- .6 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

Part 2 - PRODUCTS

2.1 Not used

- .1 Not used.

Part 3 - 3 EXECUTION

3.1 Not used

- .1 Not used.

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 03 30 00 - Cast-in-place concrete

1.2 SCOPE OF WORK

- .1 Removal of existing decking, timber and steel elements, and membranes as shown on the drawings.
- .2 Demolition of damaged, spalled or sound concrete areas as shown on the drawings or as directed by the Departmental Representative.
- .3 Cleaning and removal of demolition materials as work progresses or as directed by the Departmental Representative.

1.3 Environmental protection

- .1 Ensure that demolition work does not generate any adverse effects or contribute to excessive levels of air and noise pollution.
- .2 Fires and burning of waste or materials is not permitted on site.
- .3 Do not bury rubbish waste materials.
- .4 Do not dispose of waste or volatile materials including but not limited to: mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into municipal sewer system. Ensure proper disposal procedures are maintained throughout project for this type of waste.
- .5 Do not pump water containing suspended materials into watercourses or onto adjacent properties.
- .6 Control disposal and runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.
- .7 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .8 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.
- .9 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

Part 2 - PRODUCTS**2.1 Material and equipment**

- .1 Concrete demolition zones shall be outlined with sawcuts beforehand. Do not cross sawcuts. Brittle and loose concrete within the identified zones shall be removed using a very low-strength manual or mechanical hammer.

Part 3 - EXECUTION**3.1 Protection**

- .1 Prevent movement, settlement or damage of adjacent structures parts of existing building to remain.
 - .1 Provide and install bracing and shoring elements, and underpinning where necessary.
 - .2 Repair damage caused by demolition as directed by Departmental Representative.

3.2 Preparation

- .1 Disconnect and re-route electrical and telephone service lines entering the intervention zones. Post warning signs on electrical lines and equipment which must remain energized during construction activities.

3.3 Demolition

- .1 Concrete surfaces to be demolished shall be identified jointly by the Departmental Representative and the Contractor. The intervention zones shall then be outlined with a water washable paint by the Contractor.
- .2 Clean concrete free of any delaminated and contaminated down to sound concrete surface.
- .3 Sound concrete surfaces in the stripping areas shall be cleaned of all debris and laitance using an air- or water-jet as demolition work progresses. All cavities shall be carefully cleaned and no foreign substance or material likely to hinder adherence of repair materials shall remain.
- .4 Do not proceed to demolition activities with a hammer at less than 5 metres of freshly poured concrete (less than 21 days).
- .5 Remove structural framing and other elements as required.

3.4 Stockpiling

- .1 Label stockpiles, indicating material type and quantity as indicated on the drawings.
- .2 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .3 Locate stockpiled materials as directed by the Departmental Representative.

3.5 Removal from site

- .1 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project construction.

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 03 20 00 - Concrete reinforcing
- .2 Section 03 30 00 - Cast-in-place concrete

1.2 References

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

Part 2 - PRODUCTS**2.1 MATERIALS**

- .1 Formwork materials: For concrete placement, use wood and wood product formwork materials to CSA-O121 and CAN/CSA-O86.
- .2 Form stripping agent: colourless mineral oil, free of kerosene, that will not come in contact with the concrete and will not hinder adherence of specified finishing product.
- .3 Falsework materials: to CSA-S269.1.

Part 3 - EXECUTION**3.1 Fabrication and erection**

- .1 Fabricate and erect falsework in accordance with CSA S269.1.
- .2 Fabricate and erect formwork in accordance with CAN/CSA-S269.3 to produce finished concrete conforming to shape, dimensions, locations and levels indicated within tolerances required by CSA-A23.1/A23.2.
- .3 Align form joints and make watertight. Keep form joints to minimum.

3.2 Removal and reshoring

- .1 Leave formwork in place for following minimum periods of time after placing concrete: Three (3) days for concrete repairs to underside of beams.
- .2 Repair the holes left behind by formwork used to repair the surfaces and around the openings.

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 03 10 00 - Concrete forming and accessories
- .2 Section 03 30 00 - Cast-in-place concrete

1.2 References

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/ Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA-G30.18, Billet-Steel Bars for Concrete Reinforcement, A National Standard of Canada.

Part 2 - PRODUCTS**2.1 Materials**

- .1 Reinforcing steel: billet steel, grade 400, deformed bars to CAN/CSA-G30.18, unless indicated otherwise.
- .2 Cold-drawn annealed steel wire ties: to ASTM A 497.
- .3 Hooks: stainless steel threadbars, grade 316 to the requirements of ASTM A 666.

2.2 Fabrication

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2.

Part 3 - EXECUTION**3.1 Field bending**

- .1 Unless otherwise directed, do not field bend or field weld reinforcement bars.
- .2 When field bending is authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars which develop cracks or splits.

3.2 Placing reinforcement

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

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 03 10 00 - Concrete forming and accessories
- .2 Section 03 20 00 - Concrete reinforcing

1.2 Scope of work

- .1 Supply the labour, materials, tools, equipment and services required to perform the placement of repair concrete and mortars specified for concrete repair works, including for other features shown on the drawings (sidewalks).

1.3 Implementation conditions

- .1 The demolition work, concrete stripping and cleaning shall be completed before placing the repair concrete. Surface preparation shall comply with the recommendations provided by the manufacturers of specified mortars.

1.4 Special requirement

- .1 A qualified representative of the product manufacturers shall attend at the outset of each work stage to inform the Contractor on the application methods of the products, the restrictions and precautions when using the materials. He shall also ensure at the outset of each work stage and periodical surveys that his recommendations are complied with. Comply with manufacturers' instructions and his representative's recommendations.

1.5 References

- .1 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/ Methods of Test and Standard Practices for Concrete.

1.6 Submittals

- .1 Submit technical data sheets of products used in the work at least 15 days before work inception.

Part 2 - PRODUCTS**2.1 Materials**

- .1 Mortar for surface repairs: pre-packaged quick-setting cement mortar and composed among other things of hydraulic cements and natural fine aggregates.
 - .1 Compressive strength (to ASTM C109) :
 - .1 Seven (7) days: 30 MPa;
 - .2 Twenty-eight (28) days: 35 MPa.
 - .2 Freeze-thaw (gelival) cycle resistance (to ASTM C666): 104%.

- .2 Concrete for deep concrete repairs: high performance self-levelling concrete, pre-packaged at the plant and composed of Portland cement, silica fume, sand and controlled size distribution stone of 10 mm maximum nominal dimension.
 - .1 Compressive strength (to ASTM C39) :
 - .1 Seven (7) days: 30 MPa;
 - .2 Twenty-eight (28) days: 40 MPa.
 - .2 Entrained air (to ASTM C457): 7 ±2 % (volume).
 - .3 Freeze-thaw (gelival) cycle resistance (to ASTM C666): 99%.
- .3 Concrete for the reconstruction of the sidewalk:
 - .1 Portland cement: general use to CAN/CSA A3001, Type GU.
 - .2 Water: to CSA A23.1.
 - .3 Aggregates: to CSA A23.1/A23.2.
 - .4 Mixes:

Description	Type-Class of exposure	Compressive strength at 28 days (MPa)	Max. Water/ Cement Ratio ⁽¹⁾⁽²⁾	Coarse aggregates (mm)	Air Content ⁽³⁾ (%)	Slump ⁽⁴⁾ (mm) ±20
Sidewalk	C-2	32	0,45	20	5-8	80

(1) Ternary cement, type GUb-S/SF or GUb-F/SF. The total mass of supplementary cementing materials (fly ash, silica fume and slag) shall not exceed 30% of the total weight of the binder.

(2) Where silica fume is used, the water/cement ratio becomes the water/(cement + silica fume) ratio.

(3) Air content is always the same, whether a superplasticizer is added or not.

(4) Tolerances in specified slump values apply only for control.

- .4 Anchoring mortar for bonding rebar hooks: hybrid adhesive composed of urethane methacrylate, hardener, cement and water.
- .5 Curing compound: to the requirements of ASTM C 309. The product shall not adversely affect the appearance of the concrete or the adherence of the surface finishing product.
- .6 Impregnation agent, corrosion inhibitor and binder: three component water based epoxy-modified cement. Bond strength to CAN/CSA-A23.2-6B:
 - .1 Concrete: 2 to 3 MPa.
 - .2 Steel: 1 to 2 MPa.

Part 3 - EXECUTION

3.1 Preparation

- .1 Demolition and surface preparation work shall be completed and approved. Obtain Departmental Representative's authorisation before concrete is poured and mortar placed.
- .2 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .3 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing in adverse weather.

- .4 Protect previous Work from staining.
- .5 Clean and remove stains prior to application for concrete finishes.
- .6 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.
- .7 In locations where indicated on the drawings, drill holes in existing concrete. Place steel hooks in stainless steel and sink solidly with specified adhesive to anchor and hold hooks in positions as indicated.

3.2 Construction

- .1 Do cast-in-place concrete work in accordance with CSA-A23.1/A23.2.
- .2 In each case where repair work requires the installation of formwork, the quantity of mixed concrete shall be sufficient to place the concrete in a single, continuous operation.
- .3 Finishing and curing: Use curing compounds compatible with applied finish on concrete surfaces. Applied finish on concrete. Provide written declaration that compounds used are compatible.

3.3 Field quality control

- .1 Inspection and testing of concrete and concrete materials will be carried out by a testing laboratory designated by the Departmental Representative and to his or her satisfaction.
- .2 Ensure test results are distributed for discussion at pre-pouring concrete meeting between Departmental Representative.
- .3 The Departmental Representative will pay for costs of tests.
- .4 Laboratory will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .5 Inspection or testing by Consultant will not augment or replace Contractor quality control nor relieve Contractor of his contractual responsibility.
- .6 After the concrete curing period, all the surfaces shall be subject to soundings with a hammer in order to identify any adherence failure or flaked or scaled concrete zones that may have been overlooked.
- .7 Defective zones shall be demolished and rebuilt to the requirements set forth in the plans and specifications before work may resume and at Contractor's expense.

3.4 Sidewalks

- .1 Disconnection joints:
 - .1 Location of disconnection joints:
 - .1 At the intersection of sidewalks or curbs.
 - .2 At the meeting interface of and along all rigid feature such as posts, low walls, walls, etc.
 - .3 At temporary break points of work and at all intervals but not exceeding 6000 mm in length.
 - .2 Terminate wire mesh or rebars at all expansion joints.

- .3 Expansion joint sections: install a 10 mm thick expanded polyethylene foam board, stopping 15 mm from all exposed surfaces and covering entirely the rest of the concrete section. Fill the remainder of the joint level with the concrete surfaces using a plastic sealant.
- .2 Surface finishing:
 - .1 Sidewalks: densify the concrete surface using a levelling vibrating screed. Correct any imperfections with an aluminium or magnesium trowel and roughen by dragging a damp burlap across the surface. The burlap must contact the surface over minimum length of 1200 mm.
 - .2 Edges: the edges shall be rounded to 6 mm radius along the sidewalks and curbs, and at edges of expansion joints using an appropriate tool.

END OF SECTION

Part 1 - GENERAL**1.1 Work of this section**

- .1 All stone wall surfaces are subject to thorough cleaning of the exposed masonry before work is undertaken.

1.2 Action and informational submittals

- .1 Provide proposed cleaning method and type of protection from cleaning residue for in-place conditions.

1.3 Quality assurance

- .1 Regulatory Requirements: ensure that Work is performed in compliance with all applicable Provincial regulations.
- .2 Work sample:
 - .1 Notify Departmental Representative 48 hours before commencing cleaning of each test patch. Obtain approval from Departmental Representative before commencing test.
 - .2 Conduct tests to determine effectiveness of following parameters for cleaning of masonry: water pressure and temperature, nozzle types and spraying distances.
 - .3 Start with lowest impact tests and stop testing when desired level of cleaning is achieved. Stop testing immediately when damage occurs.
 - .4 Test brushing and spraying as an alternative to pressure washing. Submit test outcomes to Departmental Representative for review. Use method approved by Departmental Representative.

1.4 Ambient conditions

- .1 Do not use wet cleaning method when there is a risk of frost.

Part 2 - PRODUCTS**2.1 Materials**

- .1 Use clean potable water free of contaminants.
- .2 Treat water which has high metal content before use in cleaning.
- .3 Use clean air, free of oil and other contaminants.

2.2 Hot water

- .1 Use water at 20 °C.
- .2 Generate hot water in flash boilers or other suitable appliance.

2.3 Tools and equipment

- .1 Use only brushes with natural or soft plastic bristles.
- .2 Use only scrapers of wood or plastic.

- .3 Use water pumps fitted with accurate pressure regulators and gauges capable of being pre-set and locked at maximum specified levels. Water pumps to have rating of 150 kPa.
- .4 Use air compressors equipped with on-line oil filters to avoid spraying oil onto masonry.
- .5 Use gun equipped with pressure gauge at nozzle end.
- .6 Use plastic or non-ferrous metal piping and fittings.

Part 3 - EXECUTION

3.1 Site verification of conditions

- .1 Record existing conditions with photographs before and after cleaning. Notify Departmental Representative of potential complications with existing conditions.
- .2 Report to Departmental Representative conditions of deteriorated masonry or joints not noted on Contract Drawings and identified before and during cleaning.
- .3 Obtain written approval of Departmental Representative before cleaning areas of deteriorated masonry.

3.2 Preparation

- .1 Protect operatives and other site personnel from hazards.
 - .1 Ensure good ventilation in work area.
 - .2 Ensure workers wear eye, head, face protection, protective gloves, coveralls, boots and respirator to relevant MSHA/NIOSH standards.

3.3 Protection of in-place conditions

- .1 Cover and protect non-masonry finishes and surfaces not to be cleaned.
- .2 Protect wood and metal surfaces adjacent to preserved masonry elements and structures.
- .3 Remove wooden coping from top of walls before cleaning.

3.4 Execution of cleaning

- .1 Proceed with cleaning in accordance with written instructions on methods, systems, tools and equipment approved by Departmental Representative.
- .2 Dry brush or scrape surface deposits on walls.
- .3 Pre-wet masonry surface when necessary. Work from bottom of wall upwards.
- .4 Do not exceed maximum pressure at nozzle or have nozzle closer to masonry than approved by Departmental Representative during tests.
- .5 Stop work when cleaning has detrimental effect on plants and surrounding historic material.
- .6 Soften and loosen heavy dirt and calcite deposits with extended water spraying, then brush stained surfaces. Remove thick deposits with wooden scrapers.
- .7 Remove vegetation and any organic growth in or on masonry.
 - .1 Soak masonry with low-pressure water.
 - .2 Follow soaking by gentle scrubbing with natural bristle brush.

.8 Medium-Pressure Water Cleaning:

- .1 Remove stains and accumulated dirt with water at medium-pressure between 350-2700 kPa.
- .2 Use a fan-type nozzle with minimum 375 mm spread.
- .3 Hold nozzle minimum 450 mm from masonry surface.

3.5 Protection of work

- .1 Protect finished Work from damage until take-over.

3.6 Site cleaning

- .1 Clean up the site and remove all waste in accordance with Section 01 74 21 (Construction/ Demolition Waste Management and Disposal).

END OF SECTION

Part 1 - GENERAL**1.1 Related requirements**

- .1 Section 04 03 08 – Historic: Mortaring.

1.2 References

- .1 Definitions
 - .1 Raking: the removal of loose or deteriorated mortar to 30 mm depth or as otherwise indicated on the drawings.
 - .2 Repointing: filling and finishing of masonry joints from which mortar is missing, has been raked out or where no mortar existed.
 - .3 Tooling: finishing of masonry joints using appropriate tool to provide final contour.
 - .4 Low-pressure water cleaning: water soaking of masonry using less than 350 kPa (50 lb/po²) measured at nozzle tip of hose.
- .2 Canadian Standards Association (CSA)/CSA International
 - .1 CAN/CSA A23.1/A23.2, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
 - .2 CAN/CSA A179, Mortar and Grout for Unit Masonry.

1.3 Quality assurance

- .1 Masonry Contractor:
 - .1 Call upon one only masonry contractor to perform masonry work at hand.
 - .2 Masonry contractor will have to be capable of demonstrating his skills and will present three (3) realizations in historic stone masonry work on projects of similar size and complexity to Work of this Contract during the last 10 years.
 - .3 Masonry contractor to have good level of understanding of structural behaviour of masonry walls when masonry work involves replacing or repairing stonework or brickwork which are part of structural masonry work.
- .2 Masons:
 - .1 Mason to have certificate of qualification with 5 years minimum experience in historic stone or brick masonry work.
 - .2 Masons to have proof of license certification for proprietary restoration mortars.
- .3 Mock-ups:
 - .1 Construct two (2) work samples 1,5 m x 1,5 m where indicated by Departmental Representative to demonstrate raking and repointing procedures.
 - .2 Provide Departmental Representative with at least 24 hours' notice prior to construction of the mock-ups.
 - .3 Carry out mock-up construction under the supervision of Departmental Representative to demonstrate one's full understanding of specified procedures, techniques and formulations is achieved before work is undertaken.

- .4 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with Work.
- .5 Accepted mock-up will demonstrate minimum standard for this work. Mock-up will remain as part of finished work.

1.4 Delivery, storage and handling

- .1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.
- .2 Keep material dry. Protect from weather, freezing and all forms of contamination.
- .3 Ensure that manufacturer's labels and seals are intact upon delivery.
- .4 Remove rejected or contaminated material from site.

1.5 Ambient conditions

- .1 Maintain masonry temperature between 10 and 25 °C for entire duration of work.
- .2 Ambient temperature lower than 10 °C: store mortaring materials for immediate use within heated enclosure in accordance with section 04 03 08 (Historic - Mortaring) and allow them to reach minimum temperature of 10 °C before use.
- .3 Only water can be heated before use. Provide hot water to a maximum 40 °C on site during cold weather.
- .4 Maintain mortar at temperatures between 5 and 40 °C.

Part 2 - PRODUCTS

2.1 Mortar

- .1 Mortar: to CAN/CSA A179 and in accordance with section 04 03 08 (Historic - Mortaring).

Part 3 - EXECUTION

3.1 Raking joints

- .1 Use manual raking tool to remove deteriorated and bonded mortar from masonry units. The use of saws is strictly prohibited.
 - .1 Remove deteriorated mortar and adhered mortar from masonry elements to sound mortar or 30 mm in depth in stone veneer, leaving square corners and a flat surface at back of cut.
 - .2 Clean out voids and cavities encountered.
- .2 Ensure that no stones and other masonry units are chipped, altered or damaged by work to remove mortar in joints.
- .3 Clean surfaces of joints by compressed air or water under low pressure without damaging texture of masonry units.
- .4 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.
- .5 Leave no standing water.

3.2 Repointing

- .1 Dampen joints as well as masonry units.
- .2 Keep masonry damp while pointing is being performed.
- .3 Completely fill joint with mortar. Use type « N » mortar in stone veneer.
 - .1 Where surface of masonry units has worn rounded edges keep pointing back from surface to keep same width of joint.
 - .2 Avoid feather edges.
 - .3 Pack mortar solidly into voids and joints.
- .4 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 to full depth.
 - .3 All layers to be applied in a single day.
- .5 Tool and finish joints to match existing joints or as directed by Departmental Representative. Tool, compact and finish using jointing tool or mason's slick.
- .6 Remove excess mortar from masonry face before it sets.

3.3 Protection during curing process

- .1 Cover completed and partially completed work not enclosed or sheltered at end of each work day. Membranes should be tightly installed to prevent finished work from drying out too rapidly.
- .2 Cover with waterproof tarps to prevent weather from eroding recently repointed material.
 - .1 Maintain tarps in place for minimum of two (2) weeks after repointing.
 - .2 Ensure that bottoms of tarps permit airflow.
- .3 Anchor coverings securely in position.
- .4 Damp cure:
 - .1 Provide damp cure for pointing mortars.
 - .2 Install and maintain wetted burlap protection throughout the curing process and over minimum three (3) days.
 - .3 Wet mist burlap only – ensure no direct spray reaches surface of curing mortar.
 - .4 Shade areas of work from direct sunlight and maintain constant dampness of burlap.
- .5 Protect from drying winds. Pay particular attention at corners of structure.
- .6 Maintain ambient temperature of minimum 10 °C after repointing masonry for:
 - .1 Minimum three (3) days in summer.
 - .2 Minimum thirty (30) days in cold weather conditions using dry heated enclosures.

3.4 Cleaning

- .1 Clean surfaces of mortar droppings, stains and other blemishes resulting from work of this contract as work progresses.

- .2 Remove droppings and splashings using clean sponge and water.
- .3 Do further cleaning using stiff natural bristle brushes after mortar has attained its initial set and has not fully cured.
- .4 Clean masonry with stiff natural bristle brushes and plain water only if mortar has fully cured.
- .5 Clean masonry with low pressure 15 to 45 lb/po² clean water and soft natural bristle brush.

3.5 Protection of completed work

- .1 Protect adjacent finished work against damage which may be caused by on-going work.

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 04 03 07 – Historic: Masonry Repointing
- .2 Section 04 03 42 – Historic: Replacement of stone
- .3 Section 04 03 43 – Historic: Dismantling and Reconstruction of Stone Masonry

1.2 Alternates

- .1 Obtain Departmental Representative's approval before changing manufacturer's brands or sources of supply of mortar materials during entire contract or other methods of mixing mortar specified elsewhere in this specification.

1.3 References

- .1 Canadian Standards Association (CSA)/CSA International
 - .1 CAN/CSA-A179, Mortar and Grout for Unit Masonry.

1.4 Technical data sheets

- .1 Submit technical data sheets of products used at least fifteen (15) days prior to commencing work.

1.5 Testing standards

- .1 Flow and cube strength: to ASTM C 270.
- .2 Vicat cone test: to ASTM C 780.
- .3 Cube strength: to CAN/CSA-A179, annexe B.
- .4 Flexural bond strength: to ASTM C 1072.

1.6 Ambient conditions

- .1 Execute work when ambient temperature is above 10 °C. When ambient temperature is below 10 °C, cover and heat work as directed by Departmental Representative.
- .2 Prepare and maintain temperature of mortar between 5 and 40 °C until used.
- .3 Maintain the temperature of receiving surfaces and mortar between 10 and 25 °C for 72 hours after application in summer and for 30 days in winter.

Part 2 - PRODUCTS**2.1 Mortars**

- .1 Type N joint and bedding mortar: based on proportion specifications, consisting of 1 part white Portland cement, 1 part lime, and 6 parts sand.
- .2 Repointing mortar for stone coping units: use gray polyurethane flexible mortar containing sand.
- .3 All dry mortar materials shall be premixed at the plant, bagged and originate from one (1) only manufacturer.

2.2 Compressive strength

- .1 Compressive strength measured on collected samples shall comply with the following:
 - .1 Type N mortar:
 - .1 compressive strength 2 MPa at 7 days
 - .2 compressive strength 3,5 MPa at 28 days
 - .2 Type S mortar:
 - .1 compressive strength 5 MPa at 7 days
 - .2 compressive strength 8,5 MPa at 28 days

2.3 Air content

- .1 Type N mortar: 18 % maximum.
- .2 Type S mortar: 18 % maximum.

2.4 Workability

- .1 Bedding mortar: Vicat cone penetration test to be between 40 and 50 mm depending on outside temperature, as directed by the Departmental Representative.
- .2 Repointing mortar: Vicat cone reading to be between 20 and 30 mm depending on outside temperature, as directed by the Departmental Representative.

Part 3 - EXECUTION**3.1 Lime mortar batching**

- .1 Mix mortar in a clean mortar mixer. Use potable water in quantities recommended by the manufacturer and mix as indicated.
- .2 Mortar mixing should always be carried out by the same person.
- .3 Rebatching of mortar is not authorised.
- .4 In collaboration with the laboratory representative, determine the water/binder ratio and the mixing time to meet in order to obtain the desired consistency for the bedding mortar and the repointing mortar. Measure subsequently the water added to each batch and time the mixing to meet the determined values.

3.2 Polyurethane mortar batching

- .1 Mix mortar components to manufacturer's recommendations.

3.3 Cleaning

- .1 Remove droppings and splashings using clean sponge and water.
- .2 Clean masonry with low pressure clean water between 15 to 45 lb/po² and soft natural bristle brush.

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 04 03 07 – Historic: Masonry Repointing
- .2 Section 04 03 08 – Historic: Mortaring
- .3 Section 04 03 43 – Historic: Dismantling and Reconstruction of Stone Masonry

1.2 References

- .1 ASTM International
 - .1 ASTM C 97/C 97M, Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
 - .2 ASTM C 170/C 170M, Standard Test Method for Compressive Strength of Dimension Stone.
 - .3 ASTM C 568, Standard Specification for Limestone Dimension Stone.
 - .4 ASTM C 616, Standard Specification for Quartz-Based Dimension Stone.

1.3 Action and informational submittals

- .1 Shop Drawings:
 - .1 Submit shop drawings describing method of stone replacement, including removal, shoring and erection.
 - .2 Submit drawings stamped and signed by professional engineer registered or licensed in Québec.
 - .3 Keep in mind that no technical document in DWG format will be provided to contractor and/or subcontractor.
- .2 Drawings of stone cutting:
 - .1 Submit a drawing for each type of stone being replaced showing dimensions, type of finish on exposed and unexposed faces, bedding planes, location of anchors and other details.
 - .2 Submit drawings along with samples.
- .3 Samples:
 - .1 Submit required samples of replacement stones not less than fifteen (15) days before masonry work begins.
 - .1 Submit two (2) samples of coping replacement stones.
 - .2 Submit one (1) of each type of masonry reinforcement and tie proposed for use in this project.
 - .3 Choose samples from the currently mined bed in the quarry and provide a certificate issued by the quarry.

1.4 Data sheet

- .1 Submit technical data sheets containing the tested chemical and physical-mechanical properties issued by a recognized laboratory. Information on data sheets not date back to

more than twenty four (24) months. Where such product data is not available, provide for costs associated with these laboratory tests.

- .2 Technical data sheets to indicate the origin of the stone, the name of the quarry and identify the operator.

1.5 Quality assurance

- .1 Allow Departmental Representative access to mason's workshop for inspection of current work-in-progress.
- .2 Qualification:
 - .1 Masonry contractor will have to be capable of demonstrating his skills and will present three (3) realizations in historic stone masonry work on projects of similar size and complexity to Work of this Contract during the last 10 years.
 - .2 Execute work of this section by personnel experienced in preservation of historic masonry.
 - .3 Masons engaged by Masonry Contractor to have minimum of five (5) years' experience with historic masonry.
 - .4 Departmental Representative has right to reject masons who do not demonstrate appropriate abilities or experience.
- .3 Provide the Departmental Representative with a 5-year warranty (material and labor) on the quality of the stone provided.

1.6 Supply

- .1 When submitting his bid, the Contractor shall provide a written statement asserting that the new stones required in the Contract will be provided to ensure that milestones and timelines are met.
- .2 Ten (10) days after notice of acceptance of bid, the Contractor shall submit the sandstone data sheet for approval.

1.7 Delivery, storage and handling

- .1 Deliver, store and handle materials to avoid altering or staining their finish.
- .2 Keep materials dry. Protect materials from weather conditions, frost, and all forms and sources of contamination.
- .3 Do not place stones directly on the ground.

1.8 List of stones

- .1 Make a list of each of the stones to be replaced, indicating their accurate dimensions, their location in the structure and a reference to the stone cutting drawings submitted.

Part 2 - PRODUCTS

2.1 Materials

- .1 Obtain new stone from a single quarry source acceptable to Departmental Representative. Ensure single quarry source has resources to provide materials of consistent quality and matching existing stone or to specifications.

- .2 Limestone: Class III (high density), fossiliferous limestone, average grain stone to ASTM C568, color and texture to match that of the existing stones, originating from Saint-Marc-des-Carières.
- .3 Granite stone: "Caledonia" type granite to ASTM C615, colour and texture to match existing stones.

2.2 Characteristics of the fossiliferous limestone (dimension stone)

- .1 Limestone:
 - .1 Stratification: bedding plane not in excess of 15% relative to cut plane.
 - .2 Density: 2600 kg/m³.
 - .3 Absorption: 0,15%.
 - .4 Compressive strength: 60 MPa.

2.3 Granite stone characteristics

- .1 Density: 2 560 kg/m³.
- .2 Absorption: 0,4%.
- .3 Compressive strength: 131 MPa.
- .4 Bending strength: 8,3 MPa.

2.4 Bedding plane

- .1 All types of stone with horizontal bedding plane.

2.5 Dressing of stone units

- .1 Stones to be perfectly squared to shape and dimensions indicated on the drawings or to existing dimensions. Dress exposed faces true. Finish exposed faces of stones to match finish of existing stones or as specified on the drawings.
- .2 Execute profiled work from full size details and templates. Make exposed arises in true alignment and ease slightly to prevent snipping.
- .3 Stones may not be drilled to fit lifting hooks.
- .4 Finish exposed faces and edges of stones to comply with requirements indicated for finish and to match approved samples and field-constructed mock-up.

2.6 Fabrication tolerances

- .1 Fabricate dimension stone to the following tolerances:
 - .1 Length: plus or minus 2 mm.
 - .2 Height: plus or minus 2 mm.
 - .3 Deviation from square: plus or minus 2 mm, the longest edge as the base.
- .2 Use calipers, a square and a level to measure the space to fill. Provide mortar joints of 10 mm to 12 mm thickness.
- .3 Drill stones for anchors as specified on the drawings.

2.7 Rejects

- .1 Limestone units originating from blasted quarry bed will be refused.
- .2 Limestone units originating from naturally fractured beds will be refused.
- .3 After cutting and dressing, stone units shall display none of the following imperfections:
 - .1 Chipping and pick marks;
 - .2 Crack, fracture and traces of stone splitting;
 - .3 Continuous traces of quartz more than 1,0 mm thick.
- .4 The Contractor shall control the quality of the stones delivered to the construction site and the Departmental Representative reserves the right to reject stones that do not meet the quality criteria set out for this project.

2.8 Mortar

- .1 Mortar (Type N): in accordance with section 04 03 08 (Historic - Mortaring).

2.9 Anchoring adhesive

- .1 Hybrid adhesive mortar composed of methacrylate resin, hardener, cement and water.

2.10 Anchors

- .1 Anchors: A316 grade stainless steel to AWS D1.6, sealed with anchoring adhesive or structural resin.

2.11 Structural resin

- .1 Structural resin injected to fill the cavities made for smooth shanks in facing stones installed with retractable anchors: high modulus binder in structural epoxy adhesive, low viscosity and high injection resistance.

Part 3 - EXECUTION**3.1 Preparation**

- .1 Move and lift stone units using means to prevent damage. Submit stone units dropped or impacted to Departmental Representative for inspection and approval.
- .2 Indicate bedding planes of stone units. Duplicate bedding marks on usable pieces of cut stone.

3.2 Removal of stones

- .1 Proceed to the removal of identified stones in accordance with section 04 03 43 (Historic - Dismantling and Reconstruction of Stone Masonry).
- .2 Remove dust, loose fragments and mortar from slots and voids as specified on the drawings.

3.3 Joint raking

- .1 Rake joints around stones to be removed in accordance with section 04 03 07 (Historic - Masonry Repointing).

3.4 Moving stones

- .1 Use Lewises or dogs to lift stones to working level.
- .2 Slide stones into place on wood ramps.
- .3 Protect edges of stone from damage when hoisting and lifting from position. Use separators or wood shims to isolate units from hoisting belts. Incorporate only undamaged stones in Work.

3.5 Dimension stone replacement

- .1 Install masonry anchors and connectors in accordance with CAN/CSA A-370 unless indicated otherwise. Prior to placing mortar, obtain approval of Departmental Representative of placement of such elements.
- .2 The anchoring adhesive or the structural resin used to fill the cavities performed in the stones shall not overrun or flow into the mortar joint.
- .3 Co-ordinate bond pattern, coursing height and joint width with existing masonry work.
- .4 Dampen stone and slot surfaces before applying mortar.
- .5 Apply mortar and lay stones.
 - .1 Lay stones on full beds of mortar.
 - .2 Fill vertical joints buttered and placed full in face, and at vertical joint between wythes.
 - .3 Lay stones and tool joints in one operation, tooling with a round jointer to provide smooth joints compressed uniformly concave.
 - .4 Rake bedding mortar back to a minimum depth of 25 mm and make ready for pointing with pointing mortar. Provide minimum 3-day damp cure to bedding mortar prior to pointing.
- .6 Apply pointing mortar. Fill raked joints with pointing mortar.
- .7 Finish joints identical to existing.
- .8 Keep fresh mortar damp for three (3) days at minimum temperature of 10 °C. Refer to section 04 03 07 (Historic - Masonry Repointing).
- .9 Clean masonry as work progresses.
 - .1 Remove mortar dropping from face of stone.
 - .2 Clear face of veneer masonry of any trace of mortar.
 - .3 Remove mortar residue from face of stone before mortar is set.
 - .4 Use only clean water and soft natural bristle brush to clean masonry.
- .10 Inspect finished work with Departmental Representative.

3.6 Filling joints / Pointing

- .1 Fill joints and repoint masonry in accordance with section 04 03 07 (Historic - Masonry Repointing).

3.7 Cleaning

- .1 Confirm acceptance of mock-up cleaning operations demonstrated to Departmental Representative before starting cleaning work.
- .2 Clean stone work surfaces after repairs have been completed and mortar has set.
- .3 Clean stone surfaces of adhesive or mortar residue resulting from work performed without damaging stone or joints.
- .4 At work completion, clear site of debris, surplus material and equipment, leaving work area in clean and safe condition.

END OF SECTION

Part 1 - GENERAL**1.1 Related sections**

- .1 Section 04 03 07 – Historic: Masonry Repointing
- .2 Section 04 03 08 – Historic: Mortaring
- .3 Section 04 03 42 – Historic: Replacement of stone

1.2 Action and informational submittals

- .1 Develop a complete and detailed photographic corpus of the structures to be dismantles and reconstructed.

1.3 Quality assurance

- .1 Qualification:
 - .1 Masonry Contractor: work of this section executed by contractor specializing in historic stone conservation work, using similar stone dismantling techniques.
 - .2 Masonry contractor will have to be capable of demonstrating his skills and will present three (3) realizations in historic stone masonry work on projects of similar size and complexity to Work of this Contract during the last 10 years
 - .3 Supervisor:
 - .1 Provide competent trade foreperson specializing in type of work required.
 - .2 Foreperson experience: Minimum five (5) years successful experience in deconstruction of historic stone masonry. Must be present on site throughout Work.
 - .4 Dismantlers of stonework: workers to have minimum (5) year record of successful stone masonry dismantling.

1.4 Delivery, storage and handling

- .1 Protect stones and take appropriate measures to facilitate resetting.
 - .1 Store dismantled masonry units protected from exposure to water, elements, and potential mechanical damage on wood pallets fully covered under polyethylene or within a shed.
 - .2 Submit storage and identification system to Departmental Representative for approval.

1.5 Ambient conditions

- .1 Loosen wet masonry only when temperature is above 5 °C.
- .2 In temperature 5 °C and below:
 - .1 Keep stones dry
 - .2 Protect wet stones from freezing.

Part 2 - PRODUCTS**2.1 Mortar**

- .1 Mortar: in accordance with specifications in section 04 03 08 (Historic – Mortaring).
- .2 Restoration mortar for limestone units: anti shrinkage grout specially designed for the restoration and reconstruction of limestone material and displaying the same physical properties as the rock when hardened, and good resistance to freeze-thaw cycles.
- .3 Restoration mortar for granite stones: anti shrinkage grout specially designed for the restoration and reconstruction of granite material and displaying the same physical properties as the rock when hardened, and good resistance to freeze-thaw cycles.

2.2 Anchoring adhesive

- .1 Hybrid adhesive mortar composed of methacrylate resin, hardener, cement and water.

2.3 Anchors

- .1 Anchors: A316 grade stainless steel to AWS D1.6, sealed with anchoring adhesive or structural resin.

2.4 Structural resin

- .1 Structural resin injected to fill the cavities made for smooth shanks in facing stones installed with retractable anchors: high modulus binder in structural epoxy adhesive, low viscosity and high injection resistance.

Part 3 - EXECUTION**3.1 Examination**

- .1 Examine masonry and notify Departmental Representative in writing of conditions detrimental to acceptable and timely completion of Work.

3.2 Protection

- .1 Prevent damage to surrounding structures and features which are to remain. Make good damage incurred.
- .2 Protect surrounding surfaces and components from damage during work.
- .3 Make good damage to historic fabric.
- .4 Obtain Departmental Representative's approval for repair methodology.

3.3 Marking and Recording

- .1 Mark stone on face before removal using marking product which can be completely erased when required without damaging masonry unit:
 - .1 Ball-point pen on diachylon, attached to stone
 - .2 Waxless chalk directly on stone.
- .2 Develop a photographic documentary of structures to be dismantled and reconstructed, the number of each stone to appear on photographs.

- .3 Ensure that temporary marking will remain in use resistant to weather, handling and cleaning until final marking of stones (if required).
- .4 Remove markings and adhesive without damaging units. Use a brush with vegetable fibre, either dry or with water without damaging masonry units. Use no solvent, acid or other chemical product.
- .5 Make record of dimensions of each stone removed from structure.

3.4 Dismantling of masonry

- .1 Ten (10) days before the start of work, provide Departmental Representative with detail drawings showing work activities and steps of the dismantling and reconstruction process.
- .2 Drawings must be prepared and sealed by a professional engineer with experience in stone masonry structures and licensed to practice in the Province of Québec.
- .3 These plans must mention the supports and shoring required to stabilise the portions of preserved structures; they must take into account the forces, thrusts and constraints applied to the overall structure.

3.5 Support

- .1 Construct shoring and cradling, and other temporary framing work needed to support structure, or parts of it, during removal operations, and in anticipation of resetting if structure is not to be completely dismantled, according to approved shop drawings bearing the seal and signature of a qualified engineer with experience in rehabilitating historic structures registered or licensed in Québec, Canada.

3.6 Method for loosening stones

- .1 Use approved methods to loosen stones which will cause no damage either to stones or to other elements or features. Cut the existing anchoring strips along the edge of the concrete walls.
- .2 Use only hand held tools.
- .3 Obtain Departmental Representative's approval for use of power tools before commencing removal work.
- .4 No loosening or removal activity may be undertaken on wet masonry when temperature is below freezing point.

3.7 Special techniques

- .1 Avoid damaging arrises of stone when removing mortar and freeing up.
- .2 Use wood wedges where required to remove or dislocate stone. Use flat pry bars protected with impact absorbing protection (burlap, cardboard).
- .3 Use nylon hoisting belts. Use minimum 2 belts per stone.
- .4 Use separators or wood shims to isolate units from hoisting belts and prevent damage to arrises of stone when hoisting and lifting from position or during handling along the wall. Where damage occurs to stone, replace stone in accordance with section 04 03 42 (Historic - Replacement of stone) at own cost.

3.8 Temporary storage

- .1 Place stones in designated area of site for cleaning, detailed inspection and for final marking, before storage.
- .2 Make stones accessible and readily retrievable when required.

3.9 Handling

- .1 Place detached stones on wood surfaces during handling. Prevent contact with metal.
- .2 When stones are lowered to ground, place directly on wooden platform used for transport or storage.
- .3 Transport and keep stones on wooden platforms.
- .4 Ensure that sharp edges of stones do not come into contact with hard objects.

3.10 Reconstruction of masonry structures

- .1 The masonry against which the work will be reconstructed shall be sound and free of loose particles.
- .2 Before placing reconstruction elements, clean with water jet and dampen surfaces before applying bedding mortar.
- .3 If required, restore the stones to be reused as indicated on the drawings. As well fill the voids created to anchor the existing fasteners using repair mortar.
- .4 Install new veneer stones on water impregnated softwood wedges. Leave until mortar has hardened and wood has dried. Remove wedges without breakage.
- .5 Use the anchors described on the drawings to fasten veneer stones (where required), as well as the specified adhesive and resin. The structural resin injected to fill the cavities performed in the stones shall not overrun or flow into the mortar joint.
- .6 Perform reassembly of masonry to alignment of adjacent stones. Provide joints of same thickness as former joints and that match with joints in adjacent area.
- .7 Construct masonry core with new materials or sound, recovered stones as directed.

3.11 Cleaning

- .1 Do cleaning operations at above freezing temperature. After cleaning, protect wet stones against freezing until dry.
- .2 Clean stones by wet scrubbing with vegetable fibre brush unless otherwise instructed.
- .3 Remove excess mortar with hand tools.
- .4 Dispose of waste in accordance with section 01 74 21 (Construction/ Demolition Waste Management and Disposal).

3.12 Filling and pointing

- .1 Fill masonry joints and point in accordance with section 04 03 07 (Historic - Masonry Repointing).

END OF SECTION

Part 1 - GENERAL**1.1 Work included**

- .1 Provide all the labour, materials, equipment and services for the fabrication and erection of the wooden structure shown on the plans or described in this specification.

1.2 References

- .1 Refer to the latest applicable edition of the following standards:
 - .1 ASTM International
 - .1 ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .2 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
 - .3 ASTM D 1761, Standard Test Methods for Mechanical Fasteners in Wood.
 - .2 CSA International
 - .1 CSA B111, Wire Nails, Spikes and Staples.
 - .2 CAN/CSA-Series O80, Wood Preservation.
 - .3 CSA O86, Consolidation - Engineering design in wood
 - .3 Forest Stewardship Council (FSC)
 - .1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.
 - .4 National Lumber Grades Authority (NLGA)
 - .1 Standard Grading Rules for Canadian Lumber.

1.3 Action and informational submittals

- .1 Product Data: submit manufacturer's instructions, printed product literature and data sheets for wood products and accessories. Include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Shop drawings
 - .1 Submit erection diagrams and shop drawings of plant fabricated elements for verification. Drawings to show the dimensions and location of members and assembly details.
 - .2 The Engineer's DWG drawings will not be provided to the Contractor. Shop drawings to be produced from the information provided on hard copy documents issued for construction.
- .3 Samples: submit for review and acceptance two (2) 300 mm long samples of decking lumber.
- .4 Certificates: submit documents signed by the manufacturer certifying that the products and materials comply with the requirements pertaining to the physical characteristics and performance criteria.

1.4 Quality assurance

- .1 Marking of timber: lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

1.5 Delivery, storage and handling

- .1 Delivery and acceptance: deliver materials and products to work site in original factory packaging, labelled with manufacturer's name and address.
- .2 Storage and handling
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect wood from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.6 Dimensions

- .1 All dimensions related to other structures and existing features to be ascertained on site.

Part 2 - PRODUCTS**2.1 Decking and planks**

- .1 Softwood S4S finish (surfaced on 4 sides), with moisture content not exceeding 19%, jack pine grade No. 1, treated.
 - .1 In accordance with requirements of CSA O141.
 - .2 Compliant with NLGA *Standard Grading Rules for Canadian Lumber*.

2.2 Accessories

- .1 Nails, spikes and staples: to CSA B111.
- .2 Bolts: 12,5 mm diameter unless indicated otherwise, hot-dip galvanized, complete with nuts and washers.
- .3 Lag screws: hot-dip galvanized, to CSA-B34.
- .4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, as recommended for purpose by manufacturer.
- .5 Fastener finishes (galvanized metal): to ASTM A123/A123M, ASTM A653, for exterior work and treated wood.
- .6 Wood treatment products:
 - .1 Unless otherwise indicated, all the wood of the terrace will be jack pine, pressure treated with a CCA K33 preservative (chromated copper arsenate base) to obtain a retention of 9,6 kg/m³ of wood by vacuum impregnation process in a closed cylinder, to latest edition of CSA 080.
 - .2 Incise wood with micro slits before treatment. Ensure that the CCA K33 preservative forms a consistent and deep envelope.

- .3 For field grooves and cuts, use a penetrating water-repellent solution to help protect wood against decay and rot efficiently in compliance with the relevant CSA 080 series standard. Product to contain 2% zinc naphthenate. This solution is not intended to replace pressure impregnation of the wood.

Part 3 - EXECUTION

3.1 Examination

- .1 Verification of the conditions: prior to product installation, ensure that the condition of surfaces and substrates previously implemented under other Sections or Contracts are acceptable and allow to perform the work in accordance with manufacturer's written instructions.
 - .1 Proceed to visual inspection of surfaces and substrates in presence of the Departmental Representative.
 - .2 Immediately notify the Departmental Representative upon identifying any unacceptable condition.
 - .3 Begin with installation only after correcting the unacceptable conditions and receiving written authorisation from the Departmental Representative.

3.2 Preparation

- .1 Before installing the elements, apply generously the wood preservative product with a brush over all surfaces exposed on site by cuts, dressing and drilling.

3.3 Installation

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Construct continuous elements using sections of longest practical length.
- .3 Select exposed decking elements for appearance. Install lumber materials so that grade-marks and other defacing marks are concealed or are removed by sanding where materials are left exposed.
- .4 Install ledger strips as indicated.
- .5 Assemble, anchor, fasten, attach and brace members to provide required strength and rigidity.
- .6 Countersink where bolt or lag screw heads would interfere.
- .7 Decking:
 - .1 Install decks in accordance with the requirements of CSA O86.
 - .2 Layout of planks, their length and location of joints shall be identical to existing.
 - .3 Apply a preservative product to the cut ends of the boards where the use of treated wood is specified.
- .8 Nailing and assemblies: unless otherwise indicated on the plans, comply with the requirements of Part 9 of the National Building Code (NBC).
- .9 Notches and drill holes: no framing member should be notched, drilled or otherwise damaged in any way without the Departmental Representative's authorisation.

.10 Rot protection:

- .1 Pieces of wood that rest on concrete or masonry should be treated with a preservative in order to prevent rot when the bottom of the element is lower than the ground level where an 13 mm air gap must be provided at the end and on the sides of the element.
- .2 Pieces of wood which are not treated with a pressure-applied preservative and rest on concrete in contact with the ground or on filling, shall be separated by a sheet of polyethylene of at least 0,2 mm thickness, or 45 lb tar paper or other approved moisture proof material. This precaution is however not required when the element is more than 152 mm above the ground.

3.4 Cleaning

- .1 Cleaning during construction: leave the premises clean at the end of each work day.
- .2 Final Cleaning: upon completion of work, remove surplus materials, waste, tools and equipment.
- .3 Waste Management: separate waste materials for recycling. Remove bins and recycling bins from site and dispose of materials at appropriate facilities.

3.5 Protection

- .1 Protect installed products and components against damage during construction.
- .2 Repair damage to adjacent materials and equipment caused during installation of rough carpentry elements.

END OF SECTION

Part 1 - GENERAL**1.1 Related requirements**

- .1 Section 04 03 07 - Historic - Masonry Repointing and Repair.

1.2 Action and informational submittals

- .1 Submit in accordance with Section 01 33 00 (Submittal Procedures).
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for water repellents and include product characteristics, performance criteria, physical size, finish and limitations;
 - .2 Submit copies of WHMIS MSDS in accordance with Section 01 35 29.06 (Health and Safety Requirements) and Section 01 35 43 (Environmental Procedures).
- .3 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.3 Quality assurance

- .1 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.4 Delivery, storage and handling

- .1 Deliver, store and handle materials in accordance with requirements stated in tender documents 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 and protect water repellents from nicks, scratches, and blemishes;
 - .3 Replace defective or damaged materials with new.

1.5 Site conditions

- .1 Ambient Conditions:
 - .1 Maintain substrate temperature and moisture level in water repellent installation area in accordance with water repellent manufacturer's printed instructions;
 - .2 Protect plants and vegetation which might be damaged by water repellents;
 - .3 Protect surfaces not intended to have application of water repellents.

1.6 Guarantee

- .1 Contractor will deliver manufacturer's written guarantee, certifying that the anti-graffiti protection will be exempt from any defects of materials and labour for a period of ten (10) years from the date of the certificate of final approval of works.

Part 2 - PRODUCTS**2.1 Materials**

- .1 Water base protector oil repellent and damp-proof for porous surfaces; high performance impregnation:
 - .1 Serves as graffiti resistant protection and against surfaces soiled by aqueous, oil or grease based substances;
 - .2 Can be used on types of stone masonry vertical surfaces, inclined, horizontal, smooth or porous;
 - .3 Does not modify treated surfaces' capability to evaporate humidity;
 - .4 Is not reversible and represents a permanent anti-graffiti system. After five (5) or six (6) cleanings of a specific surface;
 - .5 Protector can be reapplied to recharge to original protection;
 - .6 Transparent.
 - .7 Characteristics:
 - .1 Acrylic copolymer base in aqueous medium.
 - .2 Physicochemical properties:
 - .1 Aspect: milky amber-coloured liquid.
 - .2 pH value, undiluted: 6-7.
 - .3 Ionicity: cationic.
 - .4 Composition:
 - .1 Active materials: 12%.
 - .2 Water: 88%.
 - .5 Specific gravity at 20° C: 1.04.
 - .6 Flash point: none.

Part 3 - EXECUTION**3.1 Examination**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable 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 Manufacturer's instructions

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets

3.3 Preparation

- .1 Prepare and clean substrate surfaces in accordance with water repellent manufacturer's printed instructions.

3.4 Application

- .1 Apply water repellent using low pressure spraying apparatus, minimum of 2 coats, in accordance with manufacturer's printed instructions.

3.5 Field quality control

- .1 After water repellent has dried, spray coated surfaces with water to verify coating coverage. Allow Departmental Representative to witness tests.

3.6 Cleaning

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 (Cleaning). Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 (Cleaning).
- .3 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 (Construction/Demolition Waste Management and Disposal). Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.7 Protection

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by water repellent application.

END OF SECTION

PARTIE 1 - GENERAL**1.1 REFERENCES**

- .1 ASTM International Inc.
 - .1 ASTM D6164-05, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Damp proofing and Waterproofing.
 - .2 CGSB 37-GP-56M-80b(A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.
- .3 Canadian Roofing Contractors Association (CRCA)
 - .1 CRCA Roofing Specifications Manual-1997.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems
 - .2 CSA-A123.3-05, Asphalt Saturated Organic Roofing Felt.
 - .3 CSA-A123.4-04, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.
- .5 Factory Mutual (FM Global)
 - .1 FM Approvals - Roofing Products.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with roofing contractor's representative and the Departmental Representative to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's installation instructions and warranty requirements.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

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- .2 Product Data: Provide one copie of most recent technical roofing components data sheets describing materials' physical properties and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Provide shop drawings: Indicate flashing details.
- .4 Manufacturer's Installation Instructions: indicate special precautions required for seaming the membrane.

1.4 QUALITY ASSURANCE

- .1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems approved by manufacturer.

1.5 FIRE PROTECTION

- .1 Fire Extinguishers:
 - .1 Maintain one stored pressure rechargeable type with hose and shut-off nozzle,
 - .2 ULC labelled for A, B and C class protection.
 - .3 Size 1.14 kg or as indicated, on roof per torch applicator, within 6 m of torch applicator.
- .2 Maintain fire watch for 1 hour after each day's roofing operations cease.

1.6 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .2 Storage and Handling Requirements:
 - .1 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of asphalt, sealing compounds, primers and caulking materials.
 - .2 Provide and maintain dry, off-ground weatherproof storage.
 - .3 Store rolls of felt and membrane in upright position. Store membrane rolls with salvage edge up.
 - .4 Remove only in quantities required for same day use.
 - .5 Place plywood runways over completed Work to enable movement of material and other traffic.
 - .6 Store sealants at +5 °C minimum.
 - .7 Store insulation protected from daylight, weather and deleterious materials.

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- .3 Packaging Waste Management: remove for reuse of packaging materials in accordance with Section 01 74 21 (Construction/Demolition Waste Management and Disposal).
 - .1 Collect and separate plastic, paper packaging and corrugated cardboard in accordance with Waste Management Plan.
 - .2 Fold up metal banding, flatten and place in designated area for recycling.

1.7 SITE CONDITIONS

- .1 Ambient Conditions
 - .1 Do not install roofing when temperature remains below -18 °C for torch application, or to manufacturers' recommendations for mop application.
 - .2 Minimum temperature for solvent-based adhesive is -5 °C.
- .2 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.8 WARRANTY

- .1 For Work of this Section, 12 months warranty period is extended to 60 months.

PARTIE 2 - PRODUCTS

2.1 PERFORMANCE CRITERIA

- .1 Compatibility between components of roofing system is essential. Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.
- .2 Roofing System: to CSA A123.21 for wind uplift resistance.

2.2 MEMBRANE

- .1 Base sheet: to CGSB 37-GP-56M, polyester fibres to ASTM D6164, glass fibres to ASTM D6163, combination of polyester and glass fibres to ASTM D6162.
 - .1 Styrene-Butadiene-Styrene (SBS) elastomeric polymer prefabricated sheet, polyester reinforcement, having nominal weight of 180 g/m².
 - .2 Type 1, fully adhered.
 - .3 Class C - plain surfaced.
 - .4 Grade 1 - standard service.
 - .5 Top and bottom surfaces: thermofusible.

WATERPROOFING MEMBRANE AND METALLIC FLASHINGS

- .6 Base sheet membrane properties: to CGSB 37-GP-56M.
 - .1 Strain energy (longitudinal/transversal): 9.0/7.0 kN/m.
 - .2 Breaking strength (longitudinal/transversal): 17.0/12.5 N/5 cm.
 - .3 Ultimate elongation (longitudinal/transversal): 60/65 %.
 - .4 Tear resistance: 60 N.
 - .5 Cold bending at -30 °C: no cracking.
 - .6 Softening point: ≥ 105 °C.
 - .7 Static puncture resistance: 400 N
 - .8 Dimensional Stability: -0.3 / 0.3 %.
- .2 Cap sheet membrane: to CGSB 37-GP-56M, polyester fibres to ASTM D6164 and ASTM D6622.
 - .1 Styrene-Butadiene-Styrene(SBS) elastomeric polymer, prefabricated sheet, polyester reinforcement, having nominal weight of 250 g/m².
 - .2 Type 1, fully adhered.
 - .3 Class A-granule surfaced.
 - .1 Colour for granular surface: gray.
 - .4 Grade 1-standard service.
 - .5 Bottom surface thermofusible polyethylene.
 - .6 Cap sheet membrane properties: to CGSB 37-GP-56M.
 - .1 Strain energy (longitudinal/transversal): 10.0/10.0 kN/m.
 - .2 Breaking strength (longitudinal/transversal): 17.0/16.0 kN/m.
 - .3 Ultimate elongation (longitudinal/transversal): 60/65 %.
 - .4 Tear resistance: 75 N.
 - .5 Cold bending at -30 °C: No cracking.
 - .6 Softening point: ≥ 110 °C.
 - .7 Static puncture resistance: 420.
 - .8 Dimensional Stability: -0.8 / 0.2 %.
 - .9 Color for all cap sheet membrane surfaces: GRAY.
- .3 Self-Adhesive Through-Wall Membrane
 - .1 Description: Membrane composed of SBS modified bitumen and a Tri-Laminate Woven Polyethylene facer on the top surface; for use on walls, cavities and as a thru wall flashing. The self-adhesive bottom surface is protected by a silicone release sheet. Available in "**Summer Grade**" for applications at $T \geq 10^{\circ}\text{C}$ and in "**Winter Grade**" for applications at $10^{\circ}\text{C} \geq T \geq -10^{\circ}\text{C}$.
 - .2 Components:
 - .1 Reinforcement: Tri-Laminate Woven Polyethylene.
 - .2 Elastomeric bitumen: Mix of selected bitumen and SBS polymer.

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- .3 Properties:
- .1 Thickness: 1.0 mm
 - .2 Tensile strength (kN/m): (MD) = 11.3 - (XD) = 15.4
 - .3 Ultimate elongation (%): (MD) = 40 - (XD) = 25
 - .4 Flexibility at cold temperature (°C): -35
 - .5 Air permeability (L/sec. m²): < 0.0005
 - .6 Water vapour permeability (perm): < 0.016
 - .7 Static puncture (N): 400
 - .8 Tear resistance (N): (MD) = 375 - (XD) = 400
 - .9 Lap adhesion (N/m): 2 000

2.3 FLEXIBLE MEMBRANE FOR EXPANSION JOINTS

- .1 Description: Waterproofing membrane manufactured by combining a polyester fabric with modified thermoplastic polymer bitumen. The underface is covered with a thermofusible plastic film. The surface has aluminum foil adhered to the centre of the membrane and covered by a release silicone film. Nominal thickness is 4.0 mm (0.15 in) and width is 450 mm (18 in).

2.4 PRIMER

- .1 Primer for Thermofusible Membrane: Primer made of bitumen, volatile solvents and adhesive resins. Used as primer to improve the adhesion of thermofusible waterproofing membranes.
- .2 Primer for Self-Adhesive Membrane: Primer composed of SBS synthetic rubber, adhesive resins and volatile solvents. Used as primer to improve the adhesion of self-adhesive membranes.

2.5 FLASHINGS

- .1 Stainless steel sheets 316L (matte finish) 0.50 mm.
- .2 Metallic flashings: Stainless steel sheets 316L.
- .1 Thickness: 0.50 mm.
 - .2 Finish: matte

PARTIE 3 - EXECUTION

3.1 QUALITY OF WORK

- .1 Do examination, preparation and roofing Work in accordance with Roofing Manufacturer's Specification Manual and Provincial Roofing Association Manual, particularly for fire safety precautions.
- .2 Do priming in accordance with manufacturers written recommendations.

WATERPROOFING MEMBRANE AND METALLIC FLASHINGS**3.2 EXAMINATION OF ROOF DECKS**

- .3 Assembly, component and material connections will be made in consideration of appropriate design loads, with reversible mechanical attachments.

- .1 Verification of Conditions: Inspect with Departmental Representative deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.

- .2 Evaluation and Assessment:

- .1 Prior to beginning of work ensure:

- .1 Decks are firm, straight, smooth, dry, free of snow, ice or frost, and swept clean of dust and debris. Do not use calcium or salt for ice or snow removal.

- .2 Curbs have been built.

- .3 Roof drains have been installed at proper elevations relative to finished roof surface.

- .4 Plywood and lumber nailer plates have been installed to deck, walls and parapets as indicated.

- .3 Do not install roofing materials during rain or snowfall.

3.3 PROTECTION OF IN-PLACE CONDITIONS

- .1 Cover walls, walks, slopped roofs and adjacent work where materials hoisted or used.

- .2 Use warning signs and barriers. Maintain in good order until completion of Work.

- .3 Clean off drips and smears of bituminous material immediately.

- .4 Dispose of rain water off roof and away from face of building until roof drains or hoppers installed and connected.

- .5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Departmental Representative.

- .6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed Work and materials out of storage.

- .7 Metal connectors and decking will be treated with rust proofing or galvanization.

WATERPROOFING MEMBRANE AND METALLIC FLASHINGS**3.4 PRIMING**

- .1 Apply deck primer to the concrete roofing substrate at the rate recommended by manufacturer.

**3.5 PROTECTED
MEMBRANE ROOFING (PMR)
APPLICATION**

- .1 Base sheet application:
 - .1 Starting at low point of roof, perpendicular to slope, unroll base sheet, align and reroll from both ends.
 - .2 Unroll and embed base sheet in uniform coating of asphalt applied at rate of 1.2 kg/m^2 , at a temperature of 230°C .
 - .3 Unroll and torch base sheet onto substrate taking care not to burn membrane or its reinforcement or substrate.
 - .4 Lap sheets 75 mm for side and 150 mm for end laps.
 - .5 Application to be free of blisters, wrinkles and fishmouths.
- .2 Cap sheet application:
 - .1 Starting at low point on roof, perpendicular to slope, unroll cap sheet, align and reroll from both ends.
 - .2 Unroll and embed cap sheet in uniform coating of asphalt applied at rate of 1.2 kg/m^2 , EVT at point of contact.
 - .3 Unroll and torch cap sheet onto base sheet taking care not to burn membrane or its reinforcement.
 - .4 Lap sheets 75 mm minimum for side laps and 150 mm minimum for end laps. Offset joints in cap sheet 300 mm from those in base sheet.
 - .5 Application to be free of blisters, fishmouths and wrinkles.
 - .6 Do membrane application in accordance with manufacturer's recommendations.
- .3 Flashings:
 - .1 Complete installation of flashing base sheet stripping prior to installing membrane cap sheet.
 - .2 Nail or torch sheet onto substrate cap sheet or base sheet of width as indicated.
 - .3 Lap flashing base sheet to membrane base sheet minimum 100 mm and seal by mopping or torch welding.
 - .4 Lap flashing cap sheet to membrane cap sheet 150 mm and torch weld.
 - .5 Provide 75 mm side lap and seal.
 - .6 Properly secure flashings to their support, without sags, blisters, fishmouths or wrinkles.
 - .7 Do Work in accordance with manufacturer's and this Section recommendations.

WATERPROOFING MEMBRANE AND METALLIC FLASHINGS

3.6 SELF-ADHESIVE THROUGH-WALL MEMBRANE INSTALLATION

- .4 Roof penetration: Install roof drain pans, vent stack covers and other roof penetration flashings and seal to membrane in accordance with the manufacturer's recommendations and details.

- .1 All inside corners should be covered with a 150 mm (6 in.) wide strip of membrane centered on the corner. This membrane must be installed in direct contact with the primed substrate not leaving any voids under the membrane strip.
- .2 Install the membrane onto the primed surface by peeling back the release film on the underside and gluing the membrane to the surface.
- .3 All membrane overlaps must be at least 50 mm.
- .4 Holes and tears in the membrane must be repaired with air / vapour barrier membrane material. The repair must exceed the affected surface area by a minimum of 100 mm. The membrane piece applied for the repair must be sealed around its edges with mastic.
- .5 Use a roller recommended by the manufacturer to apply pressure over the entire surface of the membrane to ensure uniform adhesion to substrate.
- .6 The contractor shall inspect membrane installation meticulously at the end of each day of work and also before installation of insulation. The upper edge of the membrane must be sealed with mastic at the end of the day's work when precipitation is anticipated or when the work is expected to be delayed or interrupted by more than one day.
- .7 All small protrusions (pipes, etc.) through the waterproofing membrane, should be pre-stripped with a membrane and sealed with mastic.
- .8 Insulation should be installed as soon as possible following inspection of the membrane by a professional.

3.7 INSTALLATION OF EXPANSION JOINTS

- .1 Install membranes of expansion joints in conformance with manufacturer's recommendations.

3.8 FABRICATION

- .1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details as indicated.

WATERPROOFING MEMBRANE AND METALLIC FLASHINGS

- .2 Form pieces in 2400 mm maximum lengths. Make allowance for expansion at joints.
- .3 Hem exposed edges on underside 12 mm. Mitre and seal corners with sealant.
- .4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.
- .5 The flashings must be fabricated in accordance with the indicated specifications, 0.50 mm stainless steel sheet 316L (matte finish).

3.9 FIELD QUALITY CONTROL

- .1 Inspections:
 - .1 Inspection and testing of roofing application will be carried out by testing laboratory designated by Departmental Representative.
 - .2 Departmental Representative will pay for tests as specified in Section 01 45 00 (Quality Control).

3.10 CLEANING

- .1 Remove bituminous markings from finished surfaces.
- .2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.
- .3 Repair or replace defaced or disfigured finishes caused by work of this section.
- .4 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 (Construction/ Demolition Waste Management and Disposal).
 - .1 Place materials defined as hazardous or toxic in designated containers.
 - .2 Clearly label location of salvaged material's storage areas and provide barriers and security devices.
 - .3 Ensure emptied containers are sealed and stored safely.
 - .4 Divert unused aggregate materials from landfill to local quarry or facility for reuse as reviewed by Departmental Representative.
 - .5 Unused coating material must be disposed of at official hazardous material collections site as reviewed by Departmental Representative.
 - .6 Unused adhesive, sealant and asphalt materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

WATERPROOFING MEMBRANE AND METALLIC FLASHINGS

.7 Dispose of unused adhesive material at official hazardous material collections site approved by Departmental Representative.

.8 Dispose of unused sealant material at official hazardous material collections site approved by Departmental Representative.

.9 Dispose of unused asphalt material at official hazardous material collections site approved by Departmental Representative.

END OF SECTION

Part 1 - GENERAL**1.1 Related requirements**

- .1 Section 03 10 00 – Concrete Forming and Accessories
- .2 Section 03 30 00 – Cast-in-place Concrete

1.2 References

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM C 117-04, Standard Test Method for Material Finer than 0.075 mm (No.200) Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C 136-05, Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D 422-63(2002), Standard Test Method for Particle-Size Analysis of Soils.
 - .4 ASTM D 698-00ae1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³) (600 kN-m/m³).
 - .5 ASTM D 1557-02e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³) (2,700 kN-m/m³).
 - .6 ASTM D 4318-05, Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.
- .2 CCDG (Cahier des charges et devis généraux du ministère des Transports du Québec), latest edition.

1.3 Definitions

- .1 Classes of excavation materials: two (2) classes of excavation materials are recognized, common materials and rock materials.
 - .1 Rock excavation: excavation of material from solid masses having individual volume in excess of 1,00 m³ which cannot be removed by mechanical excavator fitted with a 0,95 to 1,15 m³ bucket. Frozen material not classified as rock.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation.
- .2 Unclassified excavation: excavation of deposits of whatever character encountered in work.
- .3 Top soil
 - .1 Material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .2 Any material reasonably free of subsoil, clay lumps, stones, debris and other objects, scrub, noxious weeds, roots, stumps and other objectionable material over 25 mm in diameter.
- .4 Waste material: excavated material unsuitable for use in work or surplus to requirements.

- .5 Borrow material: material obtained from locations outside area to be graded, and required for construction of fill areas or for other portions of work.
- .6 Unsuitable material: weak, chemically unstable, and compressible materials..
- .7 Dimensionally stabilised backfill materials: very yielding mix composed of cement, concrete aggregates and water that will not slump after placement in trenches designed to receive utility conduits and which can be readily excavated (i.e.: without preparation).

1.4 Action and informational submittals

- .1 Quality Control:
 - .1 Submit for review by Departmental Representative proposed dewatering and heave prevention methods.
 - .2 Submit to Departmental Representative written notice when bottom of excavation is reached.
- .2 Preconstruction Submittals
 - .1 Submit construction equipment list for major equipment to be used in this section prior to start of Work.
 - .2 Submit records of underground utility locates, indicating:
 - .1 location plan of existing utilities as found in field
 - .2 clearance record from utility authority
 - .3 location plan of relocated and abandoned services (as required).
 - .3 At least two (2) weeks prior to start of work, submit for review by Departmental Representative the particle size data sheets of all borrow materials that will be used.

1.5 Waste management and disposal and piled soil

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 (Construction/Demolition Waste Management and Disposal).
- .2 Divert excess aggregate materials from landfill to local quarry for reuse as directed by Departmental Representative.

1.6 Existing conditions

- .1 Buried services:
 - .1 Before commencing work verify location of buried services on and adjacent to site.
 - .2 Arrange with appropriate authority for relocation of buried services that interfere with execution of work: pay costs of relocating services.
 - .3 Remove obsolete buried services within 2 m of foundations: cap cut-offs with female plugs.
 - .4 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .5 Prior to beginning excavation Work, establish location and state of use of buried utilities and structures and notify authorities having jurisdiction. AHJ to clearly mark such locations to prevent disturbance during Work.
 - .6 Confirm locations of buried utilities by careful test excavations.

- .7 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated.
- .8 Where utility lines or structures exist in area of excavation, obtain direction of Departmental Representative before removing or re-routing.
- .9 Record location of maintained, re-routed and abandoned underground lines.
- .10 Confirm locations of recent excavations adjacent to area of excavation of this section.
- .2 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative, condition survey of existing buildings, trees and other plants, lawns, fencing, service poles, wires, rail tracks, pavement, survey bench marks and monuments which may be affected by Work.
 - .2 Protect existing buildings and surface features from damage while Work is in progress. In event of damage, immediately make repair as directed by Departmental Representative.
 - .3 Where required for excavation, cut roots or branches as directed by Departmental Representative.

1.7 Retaining Structures

- .1 Design, supply and build the temporary retaining structures required to carry out the work and prevent any movement of the ground adjacent to the excavations likely to cause damage to existing structures. Unless otherwise indicated on the drawings, execute retaining work/structures with Berlin walls held by walers fastened with tie rods. During construction, support utilities (waterworks, drainage, gas and electricity) unearthed during the excavation.
- .2 In designing this work, take into account any overloading caused by workforce, machinery and general traffic.
- .3 Engage the services of a professional engineer, or licensed to practice in Québec for the design and inspection of all shoring work (retaining walls, shoring, bracing and underpinning) required for this project.
- .4 Submit design documents and related technical information at least two (2) weeks prior to start of work.
- .5 Design documents and related technical data submitted must bear the seal and signature of a professional engineer registered or licensed in Québec.
- .6 The engineer responsible for the design of temporary facilities must provide proof of professional liability (insurance) unless employed by the Contractor, in which case the Contractor shall provide proof that the Work of his engineer is covered by his liability insurance.

Part 2 - PRODUCTS

2.1 Materials

- .1 Properties of Type 1 and Type 2 fill and requirements as follows:
 - .1 Crushed, pit run or screened stone, gravel or sand.

- .2 Gradations to be within limits specified when tested to ASTM C 136 and ASTM C 117. Sieve sizes to CAN/CGSB-8.2.

- .3 Table

Sieve designation	% Passing	
	Type 1	Type 2
75 mm	-	100
50 mm	-	-
37,5 mm	-	-
25 mm	100	-
19 mm	75-100	-
12,5 mm	-	-
9,50 mm	50-100	-
4,75 mm	30-70	22-85
2,00 mm	20-45	-
0,425 mm	10-25	5-30
0,180 mm	-	-
0,075 mm	3-8	0-10

- .4 Type 1 fill may be replaced with MG-20 type fill as defined in the latest version of CCDG (Cahier des charges et devis généraux, ministère des Transports du Québec).
- .5 Type 2 fill may be replaced with MG-112 type fill as defined in the latest version of CCDG (Cahier des charges et devis généraux, ministère des Transports du Québec).
- .2 CG-14 type fill: sand as defined in the latest version of CCDG (Cahier des charges et devis généraux, ministère des Transports du Québec).
- .3 Type 3 fill: selected material from excavation or other sources, approved by Departmental Representative for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.
- .4 Dimensionally stabilised backfill materials: proportioned and mixed to provide following properties:
- .1 Maximum compressive strength of 0,4 MPa at 28 days.
 - .2 Maximum Portland cement content of 25 kg/m³ with 40% fly ash replacement: to CSA-A3001, type GU.
 - .3 Minimum strength of 0.07 MPa at 24 h.
 - .4 Concrete aggregates: to CSA-A23.1/ A23.2.
 - .5 Cement: type GU.
 - .6 Slump: 160 to 200 mm.
- .5 Permeable granular material:
- .1 Sand or screenings, sieved and clean size 5-80 µm.

.2 Gradation:

Sieve designation	% Passing
10 mm	100
5 mm	95-100
2,5 mm	80-100
1,25 mm	60-90
0,63 mm	25-65
0,315 mm	10-35
0,160 mm	2-10
0,080 mm	0-3

.6 Clean stone:**.1 Crushed stone: 20 mm.****.2 Gradation:**

Sieve designation	% Passing
19 mm	100
12,5 mm	0-10

.7 Foundation drain perforated HDPE conduit, to BNQ 3624-120 or "Boss 2000" type with smooth inner walls or approved equivalent.**.8 Geotextile membrane synthetic membrane in non-woven polypropylene fiber, 1,1 mm minimum thickness, "Texel 7609" or "Technitex TX-90" type or approved equivalent.****Part 3 - EXECUTION****3.1 Erosion and sediment control**

- .1 Implement temporary erosion and sediment control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Comply with sediment and erosion control plan, specific to site, in accordance with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.
- .2 Inspect, repair, and maintain control measures during construction until permanent vegetation has been established.
- .3 Remove controls on a timely basis and restore and stabilize areas disturbed during removal.

3.2 Site preparation

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly.

3.3 Implementation of retaining structures

- .1 Perform retaining work and shoring as excavation work progresses in accordance with the drawings prepared by the Contractor's engineer. Have the latter verify the retaining and shoring structures.

- .2 Stop driving the sheet piles and steel piles when refusal is encountered on masonry structures.
- .3 Adjust the positioning of piles to the geometry of masonry walls and buried vestiges whose thicknesses vary and against which the retaining structures abut.
- .4 Adjust the retaining structures to the vestiges uncovered.
- .5 Insert the Berlin wall woodwork as the excavation progresses. As work progresses, fill with concrete the cavities created during excavation to prevent any sagging.
- .6 Do the following during backfilling:
 - .1 Unless otherwise indicated on the drawings or instructed by the Engineer, remove the retaining structures from the excavations.
 - .2 Do not cut the tie rods or remove the bracing before each layer of backfill layer has reached the required level.

3.4 Preparation/protection

- .1 Protect existing features as indicated and in accordance with applicable regulations.
- .2 Keep excavations clean, free of standing water, and loose soil.
- .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Departmental Representative approval.
- .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
- .5 Protect buried services that are required to remain undisturbed.

3.5 Stripping of topsoil

- .1 Begin topsoil stripping of areas as indicated after area has been cleared of brush, weeds and grasses and removed from site.
- .2 Do not mix topsoil with excavation fill material stockpiled for reuse or landfill disposal.
- .3 Stockpile reusable top soil in locations as directed by Departmental Representative. Stockpile height not to exceed 2 m and should be protected from erosion.
- .4 Dispose of unused topsoil off site.

3.6 Stockpiling

- .1 Stockpile all common fill materials for environmental characterization purposes, by a specialised firm. Costs related to environmental characterization will be borne by the Departmental Representative.
- .2 Stockpile fill materials in areas designated by Departmental Representative, in manner to prevent segregation.
- .3 Protect fill materials from contamination.
- .4 Implement sufficient erosion and sediment control measures to prevent sediment release off construction boundaries.

3.7 Shoring, bracing and underpinning

- .1 Protect sides and slopes of excavations by appropriate methods and in accordance with *Health and Safety Act*.
- .2 Construct temporary Works to depths, heights and locations as indicated.
- .3 Unless otherwise indicated or directed by Departmental Representative remove sheeting and shoring from excavations during backfill operation.

3.8 Dewatering of excavations and heave prevention

- .1 Keep excavations free of water while Work is in progress.
- .2 Provide for Departmental Representative's review details of proposed dewatering or heave prevention methods, including dikes, well points, and sheet pile cut-offs.
- .3 Avoid excavation below groundwater table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by groundwater lowering, sheet pile cut-offs, or other means.
- .4 Protect open excavations against flooding and damage due to surface run-off.
- .5 Dispose of water to authorised collection areas and in a manner not detrimental to public and private property, or portion of Work completed or under construction. Provide and maintain temporary drainage ditches and other diversions outside of excavation limits.

3.9 Excavation

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove concrete, masonry, paving, walks, demolished foundations and rubble and other obstructions encountered during excavation.
- .3 Excavation must not interfere with bearing capacity of adjacent foundations.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 Keep excavated and stockpiled materials safe distance away from edge of trench as directed by Departmental Representative.
- .6 Restrict vehicle operations directly adjacent to open trenches.
- .7 Dispose of surplus and unsuitable excavated material off site.
- .8 Do not obstruct flow of surface drainage or natural watercourses.
- .9 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .10 Notify Departmental Representative when bottom of excavation is reached.
- .11 Obtain Departmental Representative approval of completed excavation.
- .12 Remove unsuitable material from trench bottom including those that extend below required elevations to extent and depth as directed by Departmental Representative.
- .13 Hand trim, make firm and remove loose material and debris from excavations.
 - .1 Where material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil.

- .2 Clean out rock seams and fill with concrete mortar or grout to approval of Departmental Representative.
- .14 Install foundation drains and geotextile membranes as indicated and directed by the supplier. Develop drainage slopes and cunettes at the foot of structures with lean concrete (cf. Section 03 30 00).

3.10 Backfill materials and compaction

- .1 Use types of fill as indicated on drawings. Compact indicated surfaces to densities indicated on drawings. Compaction densities are percentages of maximum densities obtained from ASTM D 698 or ASTM D 1557.

3.11 Bedding and surround of underground services

- .1 Place and compact granular material for bedding and surround of underground services as indicated.
- .2 Place bedding and surround material in unfrozen condition.

3.12 Backfilling

- .1 Whether contaminated or not, excavated materials may be reused to backfill the excavations as indicated on the drawings. Contaminated materials in excess shall be managed to the requirements of applicable policies.
- .2 Do not proceed with backfilling operations until completion of following
 - .1 Departmental Representative has inspected and approved installations.
 - .2 Departmental Representative has inspected and approved of construction below finish grade.
 - .3 Inspection, testing, approval, and recording location of underground utilities.
 - .4 Removal of shoring and bracing.
 - .5 Backfilling of voids with satisfactory soil material.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .4 Do not use backfill material which is frozen or contains ice, snow or debris.
- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Backfilling around installations
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in-place concrete within 24 hours after placing of concrete.
- .7 Place dimensionally stabilised fill in areas indicated.
- .8 Consolidate and level dimensionally stabilised fill with internal vibrators.

3.13 Restoration

- .1 Upon completion of Work, remove waste materials and debris, trim slopes, and correct defects as directed by Departmental Representative.
- .2 Replace topsoil as indicated.

- .3 Reinstall lawns to elevation which existed before excavation.
- .4 Reinstall pavements and sidewalks disturbed by excavation to thickness, structure and elevation which existed before excavation.
- .5 Clean and reinstall areas affected by Work as directed by Departmental Representative.
- .6 Use temporary plating to support traffic loads over dimensionally stabilised fill for initial 24 hours.
- .7 Protect newly graded areas from erosion, traffic and maintain free of trash or debris.

END OF SECTION

