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## **1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 14 00 – Work Restrictions
- .2 Section 01 35 43 – Environmental Procedures
- .3 Section 03 33 00 – Cast in Place Concrete
- .4 Section 31 14 13 – Soil Stripping and Stockpiling
- .5 Section 31 32 19.01 – Geotextiles

### **1.2 DEFINITIONS**

- .1 **Project Authority:** Within the context of these specifications, the person exercising the roles and attributes of Canada under the contract. Parks Canada Agency will be fulfilling the role of Project Authority.
- .2 **Owner:** For the purpose of this Contract, the Owner is the Parks Canada Agency, who operates the site.
- .3 **Contractor:** The Contractor to undertake the site management and operation services defined, within the context of these specifications.
- .4 **Environmental Surveillance Officer:** A Parks Canada Agency representative who will conduct periodic and unscheduled site visits to ensure project operations are being performed in conformance with the Environmental Procedures and to provide guidance in the event of unanticipated environmental problems.

### **1.3 OBJECTIVE**

- .1 The objective of the project is to replace the concrete foundation of the Warden's Residence (a recognized heritage building of Canada) of the East Gate Complex at the Riding Mountain National Park. This work includes the procurement of a contractor to lift and temporary shore/move the wooden cabin during the construction work. Appendix A provides detailed designs for the construction of the new foundation. All work must comply with the Standards and Guidelines for the Conservation of Historic Places in Canada.

### **1.4 PROJECT LOCATION**

- .1 The EGNHS is located at the East entrance to Riding Mountain National Park on PTH #19 – see Appendix C for Location.

### **1.5 WORK COVERED BY CONTRACT DOCUMENTS**

- .1 The contract documents cover the careful dismantling of the character defining elements of the Warden's residence; the decommissioning, removal, and reinstatement of the existing building services; the procurement of a contractor to lift and temporary

shore/move the wooden cabin during the construction work; the demolition of the existing concrete foundation; and the construction of a new reinforced concrete foundation. The cabin is to be reset upon completion of the Project.

## **1.6 PROJECT SCHEDULE**

- .1 To be presented to the Departmental Representative for approval.

## **1.7 CONTRACTOR USE OF PREMISES**

- .1 Notwithstanding SACC R2850D - GC 5.10, the Contractor shall be permitted to occupy sites where they will be working in Riding Mountain National Park, free of charge from the date of award of the contract up to and including the completion date. A business license from the Parks Canada Administration Office in Wasagaming, will be required as will vehicle work passes for all of the Contractor's vehicles. These passes may be obtained free of charge from the Project Authority, PCA Environmental Officer or at the Administration Building in Wasagaming. The sites to be occupied by the Contractor include all the roads and areas specified in this contract and as directed by the Project Authority. (See Appendix C – Site Location Details)
- .2 The Contractor's occupancy of the site will be deemed to have ended, when both of the following conditions are met to the satisfaction of Parks Canada:
  - .1 All the work identified under this contract, has been completed.
  - .2 All site cleanup and any outstanding deficiencies have been addressed to the satisfaction of the Project Authority.
- .3 Limit use of premises for work, for storage, and for access, to allow:
  - .1 Owner occupancy.
  - .2 Public usage.
- .4 Co-ordinate use of premises under direction of Project Authority.
- .5 At completion of operations, condition of existing work: equal to or better than that which existed before new work started.

## **1.8 OWNER OCCUPANCY**

- .1 Owner will occupy premises during entire construction period for execution of normal operations.
- .2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

## **1.9 PRE-PURCHASED EQUIPMENT**

- .1 Certain items of equipment have been pre-purchased. These include:
  - .1 Parks Canada Agency ESO approved grass seed.

- .2 Purpose for pre-purchasing this equipment is to ensure delivery to site within required project completion schedule. Obtain necessary drawings from Project Authority and proceed to co-ordinate details for installation, connection and testing of specified equipment.
- .3 Notify Project Authority in writing at least 10 calendar days in advance of date on which materials and equipment are required.
- .4 Receive equipment F.O.B. and store and process equipment until installation.

#### **1.10 OWNER FURNISHED ITEMS**

- .1 Owner Responsibilities:
  - .1 Arrange for delivery of contract grass seed to Contractor.
- .2 Contractor Responsibilities:
  - .1 Review grass seed. Submit to Project Authority notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
  - .2 Receive and unload products at site.
  - .3 Handle products at site, including uncrating and storage.
  - .4 Protect products from damage, and from exposure to elements.
  - .5 Assemble, install, connect, adjust, and finish products.
  - .6 Repair or replace items damaged by Contractor or subcontractor on site (under his control).
- .3 Schedule of Owner furnished items:
  - .1 Parks Canada Agency ESO approved grass seed.

#### **1.11 DOCUMENTS REQUIRED**

- .1 Maintain at job site, one copy each document as follows:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders.
  - .5 Other Modifications to Contract.
  - .6 Field Test Reports.
  - .7 Copy of Approved Work Schedule.
  - .8 Health and Safety Plan and Other Safety Related Documents.
  - .9 Other documents as specified.

## **2 PRODUCTS**

### **2.1 NOT USED**

- .1 Not used.

**3 EXECUTION**

**3.1 NOT USED**

.1 Not used.

**END OF SECTION**

## **1 GENERAL**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 35 00.06 – Special Procedures for Traffic Control.
- .2 Section 01 35 43 – Environmental Procedures.

### **1.3 USE OF SITE AND FACILITIES**

- .1 The Work Site limits will be specified by Parks Canada and shall only be used for the Work purposes. The Work Site will be made available by Parks Canada to the Contractor for its non-exclusive use for the duration of the Work, unless otherwise provided in the Contract Documents.
- .2 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of source.
- .3 The Contractor shall provide sanitary facilities for work force in accordance with governing regulations and the Environmental Procedures for this project. The Contractor shall post notices and take such precautions as required by local health authorities and keep area and premises in sanitary condition.
- .4 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.
- .5 The Contractor may work within a half hour after sunrise to a half hour before sunset, Monday to Thursday. There may be restricted hours for work Friday to Sunday. Work on weekends to be approved by the Project Authority.

### **1.4 SURVEY OF EXISTING PROPERTY CONDITIONS**

- .1 Submission of tender is deemed to be confirmation that the Contractor has inspected the site and is conversant with all conditions affecting execution and completion of work.
- .2 The Contractor shall regularly monitor the condition of the Work Site and of property on and adjoining the Work Site throughout the construction period, and shall immediately notify the Owner if any deterioration in condition is detected. Such monitoring shall cover all pertinent features and property including, but not limited to, buildings, structures, roads, walls, fences, slopes, sewers, culverts and landscaped areas.

### **1.5 PROTECTION OF PERSONS AND PROPERTY**

- .1 Comply with all applicable safety regulations of the Workers' Compensation Board of Manitoba (WCB) including, but not limited to, WCB's Industrial Health and Safety Regulations, Industrial First Aid Regulations, and Workplace Hazardous Materials Information System Regulations.
- .2 The Contractor shall take all necessary precautions and measures to prevent injury or damage to persons and property on or near the Work Site.

- .3 The Contractor shall promptly take such measures as are required to repair, replace or compensate for any loss or damage caused by the Contractor to any property or, if Parks Canada so directs, shall promptly reimburse to Parks Canada the costs resulting from such loss or damage.

#### **1.6 USE OF PUBLIC AREAS**

- .1 The Contractor shall ensure that its vehicles and equipment do not cause nuisance in public areas. All vehicles and equipment leaving the Work Site and entering public roadways shall be cleaned of mud and dirt clinging to the body and wheels of the vehicle. All vehicles arriving at or leaving the Work Site and transporting materials shall be loaded in a manner which will prevent dropping of materials or debris on the roadways, and where contents may otherwise be blown off during transit such loads shall be covered by tarpaulins or other suitable covers. Spills of materials in public areas shall be removed or cleaned immediately by the Contractor at no cost to the Owner. All activities shall be in accordance with Section 01 35 43 - Environmental Procedures.

#### **1.7 SUPERVISORY PERSONNEL**

- .1 In accordance with Government of Canada GC 2.6 R28Z0D, within five Days after award notification, the Contractor shall submit to the Project Authority confirmation of supervisory personnel names and other key staff designated for assignment on the Contract.
- .2 The following personnel shall be included in the list:
  - .1 Project Superintendent
  - .2 Safety Representative
    - .1 The Project Superintendent shall be employed full time and shall be present on the Work Site each and every workday that Work is being performed, from the commencement of Work to Total Performance of the Work.
    - .2 The Project Superintendent shall nominate a Deputy Project Superintendent who shall have the authority of the Project Superintendent during the latter's absence.
    - .3 The Safety Representative shall possess safety experience in general construction. Duties shall encompass all matters of safety activities from commencement of Work until the Total Performance of the Work.

#### **1.8 MEETINGS**

- .1 The Work includes attending meetings between the Contractor and the Project Authority. The meetings will be called and chaired by the Project Authority as required. The Contractor shall be represented at such meetings to the satisfaction of the Project Authority.
- .2 The Project Authority will schedule an initial meeting to be held on site after award notification. Senior representatives of the Owner, Project Authority, Contractor,

major Sub-contractors, field inspectors and supervisors are to be in attendance.

- .3 The Contractor will be requested to assemble his site staff and sub-contractors for an environmental briefing to be conducted by Parks Canada. The briefing shall be of approximately 30 minutes in duration and held at initial project start-up. The Contractor shall ensure that all his current project staff is in attendance. The Project Authority and the Contractor will co-operate in setting the most appropriate time and place for the briefing. Subsequent to the initial environmental briefing, briefings will be set for new staff and sub-contractors showing up on the project.

## **1.9 WASTE DISPOSAL**

- .1 All surplus, unsuitable and waste materials shall be removed from the job site to approved sites. Refer to Section 01 35 43 – Environmental Procedures and Environmental Protection Plan.
- .2 Deposit of any construction debris into any waterway is strictly forbidden.
- .3 Cost for Waste Disposal described above shall be considered incidental to the Unit Price items and no additional payment will be made except as identified herein.
- .4 Waste Disposal shall be completed in accordance with Section 01 35 43 – Environmental Procedures.

## **1.10 WORK STOPPAGE**

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

### **WORK COMMENCEMENT**

- 1.11 .1 Work to commence as early in the Spring of 2019 as possible after removal of heritage masonry by Parks Canada masons, in consultation with departmental representative

## **2 PRODUCTS**

### **2.01 NOT USED**

- .1 Not Used.

## **3 EXECUTION**

### **3.01 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 01 11 00 – Summary of Work.
- .2            Section 01 35 00.06 – Special Procedures for Traffic Control.

**1.2                DESCRIPTION**

- .1            Mobilization and Demobilization consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, camp, buildings, shops, offices, supplies and incidentals to and from the project site. Mobilization and Demobilization further consists of all traffic control requirements as provided in Section 01 35 00.06 – Special Procedures for Traffic Control.
- .2            Any protective measures or movement of Contractor trailers necessitated by animal interactions and required by Parks Canada will be paid by the Project Authority, and are not to be anticipated in the Lump Sum Contract Price for Mobilization and Demobilization.

**1.3                MEASUREMENT PROCEDURES**

- .1            Mobilization and Demobilization:
  - .1            50% of Lump Sum Contract Price for Mobilization and Demobilization to be paid when mobilization to site is complete.
  - .2            The remainder of the Lump Sum Price for Mobilization and Demobilization to be paid after Contract Completion and the site has been cleaned and left in condition to the satisfaction of the Project Authority and all other Agencies having Jurisdiction.

**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            APPOINTMENT AND PAYMENT**

- .1 Contractor is responsible for coordinating and paying for services of testing laboratories such as 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 Tests specified to be carried out by Contractor under supervision of Departmental Representative.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work are to be paid by contractor.

**1.2            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 Notify Departmental Representative 48 hours minimum sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

**Part 2            Products**

**2.01            NOT USED**

**Part 3            Execution**

**3.01            NOT USED**

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

- .1      Section 01 11 00 – Summary of Work.
- .2      Section 01 14 00 – Work Restrictions.
- .3      Section 01 33 00 – Submittal Procedures.
- .4      Section 01 35 43 – Environmental Procedures.
- .5      Section 01 45 00 – Quality Control.
- .6      Section 01 77 00 – Close out Procedures.
- .7      Section 01 78 00 – Close out Submittals.

**1.2                MEASUREMENT PROCEDURES**

- .1      This Work shall be incidental to the contract and will not be measured for payment.

**1.3                COORDINATION**

- .1      Contractor to perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction Work; with progress of Work by other Contractors, and Work by Owner, under instructions of the Project Authority.

**1.4                CONSTRUCTION ORGANIZATION AND START UP**

- .1      Within seven (7) days after award of Contract, request a meeting of Contract Representatives to discuss and resolve administrative procedures and responsibilities. Meeting shall be chaired by the Project Authority who will prepare the minutes of the meeting.
- .2      Senior representatives of the Owner, Project Authority, Contractor, major Sub-Contractors, field inspectors and supervisors are to be in attendance.
- .3      Agenda to include the following:
  - .1      Appointment of official representative of participants in Work.
  - .2      Schedule of Work.
  - .3      Schedule of submittals in accordance with Section 01 33 00.
  - .4      Site safety and security in accordance with Sections 01 14 00, 01 35 43.
  - .5      Quality Control in accordance with Section 01 45 00.
  - .6      Proposed changes, change orders, procedures, approvals required, mark up percentages permitted, time extensions, overtime, and administrative requirements.
  - .7      Owner-furnished materials.
  - .8      Monthly progress claims, administrative procedures, photographs, and holdbacks.

- .9 Close out procedures and submittals in accordance with Sections 01 77 00 and 01 78 00.
- .10 Insurances and transcript of policies.
- .11 Other business.
- .4 Comply with Project Authority's allocation of mobilization areas of site; for access, traffic, and parking facilities.
- .5 During construction, coordinate use of site and facilities through Project Authority's procedures for intra project communications: Submittals, reports and records, schedules, coordination of Drawings, recommendations, and resolution of ambiguities and conflicts.
- .6 Comply with instructions of the Project Authority for use of temporary utilities and construction facilities.
- .7 Coordinate field engineering and layout work with the Project Authority.

#### **1.5 ON SITE DOCUMENTS**

- .1 Maintain at job site, one copy each of the following:
  - .1 Contract Drawings.
  - .2 Specifications.
  - .3 Addenda.
  - .4 Change Orders.
  - .5 Other modifications to Contract.
  - .6 Safety Plan.
  - .7 WHMIS.
  - .8 Spill Response Plan.
  - .9 Copy of approved Work schedule and most recent updated schedule.
  - .10 Notice of Project.
  - .11 Labour and Material Bond

#### **1.6 PROJECT SCHEDULES**

- .1 Submit preliminary construction progress schedule to Project Authority
- .2 During progress of Work revise and resubmit as directed by the Project Authority.

#### **1.7 SUBMITTALS**

- .1 Submit product data (Section 01 33 00) for review for compliance with Contract Documents.
- .2 Submit requests for payment for review, and for transmittal to Project Authority. Payment request on last day of the month.
- .3 Submit requests for interpretation of Contract Documents, and obtain instructions through Project Authority.

- .4 Process substitutions through Project Authority.
- .5 Process change orders through Project Authority.
- .6 Deliver closeout submittals for review and preliminary inspections, for transmittal to Project Authority.

**1.8 CLOSEOUT PROCEDURES**

- .1 Notify Project Authority when Work is considered ready for Substantial Performance.
- .2 Accompany Project Authority on preliminary inspection to determine items listed for completion or correction.
- .3 Comply with Project Authority's instructions for correction of items of Work listed in executed certificate of Substantial Performance.
- .4 Notify Project Authority of instructions for completion of items of Work determined in Project Authority's final inspection.
- .5 Schedule project meetings at the call of Project Authority.
- .6 Contractor, Sub-Contractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.
- .7 Note that the Project Authority will be responsible for preparing agenda for meetings, notification of meeting dates and recording meeting minutes.

**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                REQUIREMENTS**

- .1 Contractor is to digitally record progress of the Project daily, at key stages of the Work and as reasonably stipulated by the Departmental Representative.
- .2 Images and recordings are to be of reasonable quality and quantity to enable the viewer to understand the context and subject being recorded.
- .3 Key plans to indicate views of photographs and videos.

**1.2                TYPES OF DIGITAL RECORDING**

- .1 Digital photographs:
  - .1 Minimum 4 megapixels per image in a standard format that will print proportionately on a 127mm x 178mm photographic paper, or as accepted by Departmental Representative.
  - .2 Digital format of jpeg, tiff, or 1 image on letter format pdf.
  - .3 Date stamp visible in the photograph and not obscuring subject matter of photograph.
- .2 Digital videos:
  - .1 Minimum frame rate of 30fps.
  - .2 Minimum of 600x800px.
  - .3 Aspect ratio of 4:3, 5:4, 16:9, or 16:10.
  - .4 Digital format of mov, mp4, avi, wmv.
  - .5 Date stamp visible in the video and not obscuring subject matter of video.

**1.3                FREQUENCY AND PURPOSE OF DIGITAL RECORDINGS**

- .1 Digital photographs must be made for each day of work, a minimum of two photos from different angles of work on site. In addition to this, close-ups of work in progress, and photographs of product labels may be submitted.
- .2 Digital video recordings may be used to supplement the photographs in order to convey better the context and viewpoint of the photographs. Audio commentary will be acceptable.
- .3 Required digital recording submittals before or during the following work:
  - .1 Pre-construction inspection.
  - .2 Close-ups of existing building elements to be removed for bracing work including details of attachments.
  - .3 Detachment of building section(s).
  - .4 Pre-lifting of each section showing bracing.
  - .5 Detailed photographs of any structure left in the ground after lifting and moving of building sections. Exact locations of existing stones to be marked and recorded on plans.

- .6 Excavation work.
- .7 Concrete work.
- .8 Replacement of building section(s) on new foundations.
- .9 Marking of trimming line of wood siding on all elevations with tape measure to indicate heights at different boards.
- .10 Digital recordings may be used to convey defects or conditions during the course of the work. Distribution of these files to be determined by the Departmental Representative.

**1.4 QUALITY OF DIGITAL RECORDING**

- .1 Images must be clear and understandable. Blurred, dark and out-of-focus photographs may be rejected. Videos that are too shaky or move too fast may be rejected.
- .2 Digital recordings may be rejected by the Departmental Representative as being unclear. In cases where digital images have been rejected the Departmental Representative may ask for additional images to be taken at no extra cost.
- .3 Number of viewpoints, and level of detail will depend on the item/condition being recorded.
- .4 Contractor to provide own digital recording equipment.

**1.5 NAMING AND ORGANIZATION OF DIGITAL FILES**

- .1 Files to be organized in folders that are named by year-month-date.
- .2 It is recommended to name files so that the viewer can understand which area of the building is being viewed.

**1.6 BACK-UPS OF DIGITAL FILES**

- .1 Contractor to keep a back-up of all digital files for the period of the Project warranty.
- .2 Contractor to provide copies of digital files upon request by Departmental Representative until the end of the warranty period.

**1.7 SUBMISSION OF DIGITAL FILES**

- .3 See Section 01 33 00 Submittal Procedures.

**Part 2 Products**

**2.1 NOT USED**

.1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

.1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1        Section 01 14 00 – Work Restrictions.
- .2        Section 01 35 00.06 – Special Procedures for Traffic Control.
- .3        Section 01 35 29.06 – Health and Safety Requirements.
- .4        Section 01 35 43 – Environmental Procedures.
- .5        Section 01 45 00 – Quality Control.
- .6        Section 01 78 00 – Closeout Submittals.

**1.2                MEASUREMENT PROCEDURES**

- .1        This work shall be incidental to contract and will not be measured for payment.

**1.3                REFERENCES**

- .1        Not Used.

**1.4                ADMINISTRATIVE**

- .1        Submit to Project Authority submittals listed for review. Submit with reasonable promptness and in orderly sequence so as to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .2        Do not proceed with Work affected by submittal until review is complete.
- .3        Present drawings, measurements, and samples in SI Metric units.
- .4        Review submittals prior to submission to Project Authority. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and shall be considered rejected.
- .5        Notify Project Authority in writing at time of submission, identifying any deviations from requirements of Contract Documents stating reasons for deviations.
- .6        Verify field measurements and affected adjacent Work is consistent.
- .7        Contractor's responsibility for errors and omissions in submission is not relieved by Project Authority's review of submittals.
- .8        Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Project Authority review.
- .9        Keep one reviewed copy of each submission on site.

**1.6 CERTIFICATES AND TRANSCRIPTS**

- .1 Immediately after award of Contract, submit Workers' Compensation Board status and proof of insurance coverage for professional liability.

**1.7 REQUIRED CONTRACTOR SUBMITTALS**

- .1 General
  - .1 This Clause identifies the plans, programs, and documentation required prior to mobilization on site and during the construction phase.
  - .2 Pre-Mobilization Submittals: The Contractor shall not begin any site Work until the Project Authority has authorized acceptance of submittals in writing. Submit the following plans and programs to the Project Authority for review a minimum of seven (7) business days prior to mobilization to the project site:
    - .1 Project schedule. Submission shall include both a paper copy of the schedule and an electronic copy.
    - .2 List of sub-contractors, suppliers and consultants, their role and their key personnel, including names and positions, addresses, telephone and cellular telephone numbers, as requested by Project Authority.
    - .3 Contractor Chain of Command, listing key Contractor personnel, including for each name, position, qualification, experience, telephone, cellular telephone and numbers. The list shall include the names and telephone/cellular telephone numbers for contact persons who are available on a 24-hour basis in the event of emergencies.
    - .4 Contractor shall develop an "Emergency Procedures Protocol" in consultation with Parks Canada.
  - .3 Construction Phase Submittals
    - .1 Progress Reports that outline the detailed Work (Contractor, sub-contractors, suppliers, consultants) completed to date as well as the anticipated Work to be performed for the following week. Also, alternate Work to be identified if Work or a portion of, proposed cannot be done due to weather, equipment breakdown, delays in delivery, etc.
    - .2 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
    - .3 Submit copies of incident and accident reports.
  - .4 Project Completion Submittals
    - .1 Record Drawings -The Contractor shall submit copies of all Contractor's Drawings revised as necessary to record all as-built changes to the Work and the Contractor shall submit a set of Contract Drawings clearly marked to record as-built changes to the Work.
  - .5 The Contractor shall not construe the Project Authority's authorization of the submittals to imply approval of any particular method or sequence for conducting the Work, or for addressing health and safety concerns. Authorization of the programs shall not relieve the Contractor from the responsibility to conduct the Work in strict accordance with the requirements of Federal or Provincial regulations, this specification, or to adequately protect the health and safety of all workers involved in the project and any members of the public who may be affected by the project. The Contractor shall remain solely

responsible for the adequacy and completeness of the programs and work practices, and adherence to them.

**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            All Division 01, 02 and 03 Sections.

**1.2                MEASUREMENT PROCEDURES**

- .1            Cost of Traffic Control shall be considered incidental to "Lump Sum Price Item 1 – Mobilization and Demobilization", and no additional payment will be made for the duration of the Contract.

**1.3                REFERENCES**

- .1            The Contractor shall provide traffic control in accordance with current edition of:
  - .1            Manitoba Infrastructure – Work Zone Traffic Control Manual.
  - .2            Manual of Uniform Traffic Control Devices for Canada, (MUTCD) distributed by Transportation Association of Canada.

**1.4                QUALITY CONTROL**

- .1            All Quality Control by the Contractor.

**1.5                GENERAL**

- .1            The Contractor shall develop and implement a Traffic Management Plan in accordance with the requirements of the current edition of the MB - Work Zone Traffic Control Manual, except where specified otherwise. The Traffic Management Plan will include plans specific to each detour and access point required for this project.
- .2            The Contractor shall design, supply, erect, move and maintain all traffic control devices, signs, temporary pavement marking, and other safety measures and provide staff to ensure safe passage of all traffic from commencement of site work to date of acceptance by the Project Authority.
- .3            All traffic and warning signs shall be either bilingual or of a symbolic or pictorial type. If bilingual signs are used, the English and French message shall be of equal letter size and at same elevation, with English on left and French on right. Assistance in translation of construction and warning signs to French may be obtained from Parks Canada.
- .4            The Contractor shall coordinate traffic management procedures with other Contractors working in the area.

## **1.6 INFORMATIONAL AND WARNING DEVICES**

- .1 Provide and maintain signs, flashing warning lights and other devices required to indicate construction activities or other temporary and unusual conditions resulting from Project Work which requires road user response.
- .2 Supply and erect signs, delineators, barricades and miscellaneous warning devices as specified in the Traffic Management Plan submitted by the Contractor and approved by the Project Authority.
- .3 Place signs and other devices to standards and in locations recommended in MB - Work Zone Traffic Control Manual.
- .4 Signs shall be wind resistant.
- .5 As situation on site changes, Contractor to update his Traffic Management Plan outlining signs and other devices required for the project and submit for the approval of the Project Authority.
- .6 Continually inspect and maintain traffic control devices in use by:
  - .1 Checking signs daily for legibility, damage, suitability and location.
  - .2 Cleaning, repairing or replacing signs as required ensuring clarity and reflectance.
  - .3 Removing or covering signs which do not apply to conditions existing from day to day or time to time.

## **1.7 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Protect travelling public from damage to person and property.
- .2 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public traffic.
- .3 Maintain access and haul roads as necessary.
- .4 Dust control: adequate to ensure safe operation at all times.
- .5 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations if night work operations required.
- .6 Provide snow removal as necessary during period of Work.
- .7 Verify adequacy of existing roads and allowable load limit on these roads.  
Contractor: responsible for repair of damage to roads caused by construction operations.
- .8 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Project Authority.
- .9 Provide competent flag persons, trained in accordance with, and properly dressed and equipped as specified in, MB - Work Zone Traffic Control Manual for situations as follows:
  - .1 When vehicles are entering or exiting Worksite access points.
  - .2 When vehicles are entering or exiting gravel pits in the park.
  - .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.
- .10 Delays to public traffic due to Contractor's operators: 10 minutes maximum.
- .11 No stoppage of traffic will be allowed for the period commencing at 07:00 a.m. on the day before a Statutory Holiday or long weekend to 7:00 a.m. on the day following a long weekend.
- .12 During hours of darkness, Contractor shall determine requirements but as a minimum, flag persons shall be additionally equipped with a red signal hand-light of sufficient brightness to be clearly visible to approaching traffic and flagging stations shall be illuminated by overhead lighting. Signs indicating hazardous conditions and signs requiring increased attention shall be marked with flashers.

**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 SECTIONS**

- .1        Section 01 14 00 – Work Restrictions.
- .2        Section 01 33 00 – Submittal Procedures.
- .3        Section 01 35 43 – Environmental Procedures.
- .4        Section 01 41 00 – Regulatory Requirements.

**1.2                MEASUREMENT PROCEDURES**

- .1        This work shall be incidental to contract and will not be measured for payment.

**1.3                REFERENCES**

- .1        Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2        Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1        Material Safety Data Sheets (MSDS).
- .3        Province of Manitoba
  - .1        Workplace Safety and Health Act.

**1.4                SUBMITTALS**

- .1        Make submittals in accordance with Section 01 33 00 – Submittal Procedures.
- .2        Submit copies of reports or directions issued by Federal or Provincial health and safety inspectors.
- .3        Submit copies of incident and accident reports.
- .4        On-site Contingency and Emergency Response Plan: address standard operating procedures to be implemented during emergency situations.

**1.5                FILING OF NOTICE**

- .1        File Notice of Project with Provincial authorities prior to beginning of Work.
- .2        Parks Canada recognizes that federal Occupational Health and Safety legislation places specific responsibilities upon Parks Canada as owner of the work place. In order to meet those requirements, Parks Canada has implemented a Contractor safety regime to ensure roles and responsibilities assigned under Part II of the Canada Labour Code and the Canada Occupational Health and Safety Regulations are implemented and observed when involving Contractor(s) to undertake work in Parks Canada work places, including on Parks Canada property.
- .3        After contract award and prior to commencement of any work under the contract, the Project Manager will hold a health and safety meeting with the Contractor. At this meeting, the Contractor is required to complete and sign an Attestation to certify the Contractor will comply with the requirements set out in the Attestation and the terms and conditions of the contract.

**1.6 SAFETY ASSESSMENT**

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

**1.7 MEETINGS**

- .1 Schedule and administer Health and Safety meeting with Project Authority prior to commencement of Work.

**1.8 REGULATORY REQUIREMENTS**

- .1 Do Work in accordance with Section 01 41 00 – Regulatory Requirements.

**1.9 PROJECT/SITE CONDITIONS**

- .1 Work at site may involve contact with wildlife See Section – 01 35 43 Environmental Procedures.

**1.10 GENERAL REQUIREMENTS**

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

**1.11 RESPONSIBILITY**

- .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
- .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, territorial and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.

**1.12 COMPLIANCE REQUIREMENTS**

- .1 Comply with Workplace Safety and Health Act, Manitoba.
- .2 Comply with Canada Labour Code, Canada Occupational Safety and Health Regulations.

**1.13 UNFORSEEN HAZARDS**

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

**1.14 HEALTH AND SAFETY CO-ORDINATOR**

- .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
  - .1 Have site-related working experience specific to activities associated with earthworks.
  - .2 Have working knowledge of occupational safety and health regulations.

- .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .4 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.

**1.15 CORRECTION OF NON-COMPLIANCE**

- .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Project Authority.
- .2 Provide Project Authority with written report of action taken to correct non-compliance of health and safety issues identified.
- .3 Project Authority may stop Work if non-compliance of health and safety regulations is not corrected.

**1.16 WORKSTOPPAGE**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not used.

**END OF SECTION**

**Part 1            General**

**1.1                SUBMITTALS**

- .1        Prior to the commencement of construction the Contractor must provide written confirmation that they have read, understand and will comply with environmental procedures as outlined in this Section 01 35 43-Environmental Procedures.

**1.2                NATIONAL PARK REGULATIONS**

- .1        The Contractor shall ensure that all work is performed in accordance with the ordinances, laws, rules and regulations set out in the Canada National Parks Act and Regulations.
- .2        The Contractor and any Sub-Contractors shall obtain a business license from the Parks Canada Administration Office in Wasagaming, prior to commencement of the contract.
- .3        All Contractor's vehicles are required to display a vehicle work pass from Parks Canada.
- .4        These permits may be obtained free of charge from the Departmental Representative, PCA Environmental Officer or at the Administration Building in Wasagaming.

**1.3                CANADIAN ENVIRONMENTAL ASSESSMENT ACT (CEAA)**

- .1        Execution of the work is subject to the provisions within the *Canadian Environmental Assessment Act* (CEAA) Guidelines Order of 2012, subsequent amendments, and Parks Canada's Interim Directive on Implementation of the Canadian Environmental Assessment Act 2012.
- .2        Failure to comply with or observe environmental protection measures as identified in these specifications may result in the work being suspended pending rectification of the issues.

**1.4                ENVIRONMENTAL BRIEFING/ MONITORING**

- .1        Parks Canada Agency (PCA) will designate an ESO (Environmental Surveillance Officer) who will conduct periodic and unscheduled visits to ensure project operations are being performed in conformance with the Environmental Procedures and to provide guidance in the event of unanticipated environmental problems. Although the ESO has authority to enforce National Parks Act violations, direction to the Contractor will be the duty of the Project Authority. The ESO retains the right to halt work or take control under emergency conditions.
- .2        All staff working on the Project site during the construction phase must attend a preconstruction "Environmental Briefing" prior to beginning work on site, presented by the ESO or alternate designated Parks Canada staff member.

## **1.5 CONSTRUCTION SITE ACCESS AND PARKING**

- .1 Construction equipment and personal vehicles, as well as, staging areas to be restricted to the footprint of the proposed parking lot, existing road or designated staging area as defined by the Project Authority.
- .2 Designated staging or lay down areas to be staked on site, approved by the Project Authority and ESO. The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery and shall instruct workers so that the "footprint" of the project is kept within defined boundaries.

## **1.6 PROTECTION OF WORK LIMITS**

- .1 Work limits of the parking lot will be staked out by the Project Authority and the Contractor is to ensure trespass outside these limits does not occur. All methods of site staking/markings to be removed at completion of project, including any additional measures implemented by the Contractor to further delineate work limits.
- .2 Avoid any unnecessary traffic, dumping and storage of materials directly over root zone of trees adjacent to work site. Protect roots of adjacent trees to the drip line during any earth work.
- .3 No removal of trees or vegetation is to occur without the approval of the Project Authority or ESO. No ground disturbance is to occur outside of work limits.

## **1.7 EROSION CONTROL**

- .1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor. If necessary, on-site sediment control measures shall be constructed and functional prior to initiating activities.
- .2 Sediment and Erosion control products such as erosion control blanket and wattles must be made of 100% biodegradable materials (ie: jute, sisal or coir fiber) and be certified weed free.
- .3 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively they are to be repaired to the satisfaction of the Project Authority and ESO.
- .4 The site will be secured against erosion during any periods of construction inactivity or shutdown. Schedule work to avoid adverse weather and rutting or damage on site due to wet conditions.
- .5 Phase construction to ensure disturbed areas are restored as soon as possible. Seeding is to be performed with PCA approved seed.

## **1.8 POLLUTION CONTROL**

- .1 The Contractor is to prepare an appropriate Spill Response Plan which is to be submitted to the Departmental Representative for review prior to mobilization to site by the Contractor. All on-site workers must receive a briefing about the Spill Response Plan and are aware of the location and use of spill kits and containment devices.
- .2 The Spill Response Plan will, at a minimum, include the following information:
  - .1 List of products and materials considered or defined as hazardous or toxic to the environment. Such products include, but are not limited to, waterproofing agents, grout, cement, concrete finishing agents, asphalt cement, sand blasting agents, paint, solvent and hydrocarbons
  - .2 Required equipment on site
  - .3 Size, type and location of spill kits
  - .4 Fuelling procedures, fuel storage.
  - .5 Spill prevention procedures (ie: containment and storage of materials, security, handling, use and disposal of empty containers, surplus product or waste generated in the application of these products in accordance with all applicable federal and provincial legislation)
  - .6 Spill response (ie: containment, clean-up, disposal of contaminated materials)
  - .7 Spill reporting procedure.
  - .8 Up-to-date emergency response contact list including contact information for reporting spills.
- .3 The Contractor shall prevent any deleterious or objectionable materials from entering any watercourse. Hazardous or toxic products to be stored on site are to be identified in the spill response plan and stored no closer than 30 metres from watercourses.
- .4 Any dewatering is to be directed towards a well vegetated area away from watercourses, unprotected catch basins and subject to approval from the ESO.
- .5 The containment, storage, security, handling, use, unique spill response requirements and disposal of empty containers, surplus product or waste generated in the use of any hazardous or toxic products shall be in accordance with all applicable federal and provincial legislation.
- .6 The Contractor shall have spill supplies at the construction site capable of containing 110% of the largest possible spill and maintained in good working order at all times. ESO and Project Authority to confirm presence of spill kits. Contractor to ensure that all personnel are informed of their location and trained in their use.
- .7 Timely and effective action shall be taken to stop, contain and clean-up all spills as long as the site is safe to enter. The Project Authority and the ESO shall be notified immediately of any spill. If not available, RMNP Dispatch is to be contacted immediately at 1-877-852-3100. All spills over 1L are to be reported.
- .8 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean-up.

- .9 The costs involved in a spill incident (the control, clean up, disposal of contaminants and site remediation to pre-spill conditions), shall be the responsibility of the Contractor. The site will be inspected to ensure completion to the expected standard and to the satisfaction of the Project Authority and ESO.
- .10 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control for on-site work by methods that are approved by the Project Authority or ESO.
- .11 Concrete mixing activities must take place over tarps and a minimum of 30m from waterbodies. Fresh, wet, uncured concrete and concrete dust must not come into contact with waterbodies. Secondary containment measures such as collection/drip trays and berms lined with air and water-tight material such as plastic and a layer of sand, and double-lined fuel tanks are required.
- .12 Excess concrete must be disposed of at an appropriate facility outside of Riding Mountain National Park (RMNP). If excess concrete from pump trucks must be dumped prior to transport outside RMNP, it must be deposited in a location approved by the Project Authority and ESO and removed following hardening for disposal at an approved facility.
- .13 Portable sanitary facilities must be serviced on a regular basis and accumulated waste disposed of at a sanitary water disposal facility. The portable facilities must have sufficient capacity, be managed to ensure waste is not discharged to the receiving environment and be set back from watercourses.

## **1.9 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION**

- .1 The Contractor shall ensure that all soil, seeds and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) outside Riding Mountain National Park (RMNP) before delivery to the work site.
- .2 Equipment fuelling sites will be identified by the Contractor and approved by the Project Authority and the ESO.
- .3 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed in 01 35 29.06 Health and Safety Requirements. Spill kits are required in every vehicle with a slip tank.
- .4 The Contractor is to ensure that unnecessary idling of vehicles is avoided.
- .5 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Project Authority. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere within Riding Mountain National Park.
- .6 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel

leaks and maintained in good working order.

- .7 Fuel containers and lubricant products shall be stored only in secure locations specified by the Project Authority. Fuel tanks or other potentially deleterious substance containers shall be secured to ensure they are tamperproof and cannot be drained by vandals when left overnight in Riding Mountain National Park.
- .8 When routine cleaning and maintenance of equipment is completed on site during construction, the contractor shall prevent any waste, sediment or debris from entering any land drainage sewer, wastewater sewer, manholes, catch basins or any watercourse.

#### **1.10 OPERATION OF EQUIPMENT**

- .1 Equipment movements shall be restricted to the 'footprint' of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Project Authority. Unless authorized by the Project Authority, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities unless authorized by the Departmental Representative and the ESO.
- .2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering parking lot work limits.
- .3 When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Project Authority and ESO.
- .4 Restrict vehicle movements to work limits.
- .5 Workers private vehicles are to remain within the construction footprint.

#### **1.11 FIRE PREVENTION AND CONTROL**

- .1 A fire extinguisher shall be carried and available for use on each machine.
- .2 Construction equipment shall be operated in a manner and with all original manufacturer's safety devices to prevent ignition of flammable materials in the area.
- .3 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented.
- .4 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. RMNP Dispatch is to be notified immediately of any fire at 1-877-852-3100. The ESO and the Department Representative shall also be notified of any fire immediately.

- .5 Fires or burning of waste materials is not permitted.

#### **1.12 WILDLIFE**

- .1 During the Environmental Briefing all personnel shall be instructed by the ESO on procedures to follow in the event of wildlife appearance near or within the work site and any other wildlife concerns.
- .2 ESO is to be notified immediately of any dens, litters, nests, carcasses, wildlife encounters (for species of interest as directed by the ESO) or carnivore observations on or around the Project area. Any sensitive features identified may be awarded a setback distance or work restriction.
- .3 If wildlife is observed at or near work site, allow the animal the opportunity to leave the work area. Do not approach or harass wildlife in any way. If potentially dangerous wildlife (eg: bear, cougar, wolf, coyote, elk or moose) persistently enter work area or display aggressive behavior, notify RMNP Dispatch 1-877-852-3100 immediately and vacate area.
- .4 If a bat is found while work is taking place, stop work and notify the Project Authority, ESO or RMNP Dispatch 1-877-852-3100 immediately. Leave the bat to exit on its own, ensure it has access to the outside via open door(s) and/or window(s). Do not handle or harass the bat.
- .5 Construction activities is limited to within a half hour of sunrise and half hour before sunset unless otherwise approved by ESO and Project Authority.
- .6 Feeding, baiting, luring or harassing wildlife is strictly prohibited. All garbage and food must be stored in wildlife proof containers or inside of vehicles at all times.

#### **1.13 RELICS AND ANTIQUITIES**

- .1 Discovery of any artifacts, relics, antiquities or items of historical interest found on the site shall be reported to the ESO or Project Authority immediately. Work is to cease, object to remain as found and Contractor to wait for instructions before proceeding.
- .2 Cultural sensitive features or objects are to be identified by ESO or Project Authority and marked where appropriate. Contractor to ensure they are not impacted by construction activities and that all crew members are aware of their location.
- .3 All cultural resources are protected under the National Parks Act and Regulations. Collection, removal, handling or disturbance of cultural resources is strictly prohibited.

#### **1.14 WASTE MATERIALS STORAGE AND REMOVAL**

- .1 The Contractor and workers shall dispose of hazardous wastes in conformance

with the Environmental Contaminants Act and applicable provincial regulations while observing the Code of Good Practice for Management of Hazardous and Toxic Wastes at Federal Establishments. See 01 35 29.06 Health and Safety Requirements

- .2 All waste (construction, trade, hazardous and domestic) shall be contained and removed in a timely manner from site to appropriate waste landfill sites located outside the park. No waste is to be burned, buried or discarded within the project site or elsewhere in RMNP. Site is to remain in tidy condition at all times.
- .3 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor, maintained in a clean condition and set back from watercourses.

#### **1.15 PARKING LOT MATERIAL, TOPSOIL, RIPRAP AND SEEDING**

- .1 All topsoil, riprap and granular material used in the construction is to be acquired from a clean source to ensure it is free of invasive or non-native plant species. Source to be inspected and approved prior to transport to RMNP by ESO.
- .2 Contractor must provide a minimum of five (5) business days' notice for source inspections.
- .3 Contractor shall seed all exposed areas immediately after construction activities with PCA approved seed mix. Seeding is to occur on top of material that is screened and consist of dark topsoil containing not more than 25% by volume organic matter (peat or composed materials). Contractor shall preform preparation of the seedbed and the sowing of grass seed. Contractor shall hand-rake the exposed area before and after seeding.
- .4 Seed shall be minimally Certified Canada No. 1 Grade quality seed varieties, in accordance with the Canadian Seed Act and Regulations, and have a minimum purity of 95% and germination of 80% with a combination of purity and germination that provide a Pure Living Seed of 80%. Seed shall be free of impurities, disease and invasive or non-native plants. A seed analysis certificate must be provided to Parks Canada Project Authority from an accredited laboratory and must be approved before purchase is finalized and any blending of seed-lots into a mix.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED SECTIONS**

.1            Not Used.

**1.2                REFERENCES AND CODES**

.1            Perform Work in accordance with National Building Code of Canada (NBC) including amendments up to tender closing date and other codes of provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply.

.2            Meet or exceed requirements of:

.1            Contract documents.

.2            Specified standards, codes and referenced documents.

**1.3                CANADIAN ENVIRONMENTAL PROTECTION ACT**

.1            Perform Work in accordance with Canadian Environmental Protection Act.

**1.4                NATIONAL PARKS ACT**

.1            Perform Work in accordance with National Parks Act when projects are located within boundaries of National Park.

**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. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

**1.2                INDEPENDENT INSPECTION AGENCIES**

- .1      Independent Inspection/Testing Agencies may 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. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and re-inspection.
- .5      All quality control and quality assurance testing required to demonstrate conformance with the specifications is considered incidental to the contract and is the responsibility of the contractor to coordinate. Testing must be completed in accordance with the standards listed in the specifications.
- .6      A minimum of one concrete test must be completed per pour or per day of concrete placement. Compaction testing and inspection must be completed by a professional engineer, engaged by the contractor, to confirm that a minimum of 98% standard proctor is achieved and that concrete is not placed on frozen material.

**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 7 days 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 REPORTS**

- .1 Submit 4 copies of inspection and test reports to Departmental Representative.
- .2 Provide copies to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

#### **1.7 TESTS AND MIX DESIGNS**

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

#### **1.8 MOCK-UPS**

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative as specified in specific Section.
- .3 Prepare mock-ups for Departmental Representative 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 If requested, Departmental Representative will assist in preparing schedule fixing dates

for preparation.

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

**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 Submit Temporary Utilities Plan describing temporary hook-ups, requirements and controls. Provide site plan and access points.

**1.2 INSTALLATION AND REMOVAL**

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

**1.3 DEWATERING**

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

**1.4 WATER SUPPLY**

- .1 Contractor to provide own continuous supply of potable water for construction use.
- .2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.
- .3 Contractor to pay for utility charges.

**1.5 TEMPORARY HEATING AND VENTILATION**

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be non-flameless type. Solid fuel salamanders are not permitted.
- .3 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.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress.
- .5 Ventilating:
  - .1 Ventilate storage spaces containing hazardous or volatile materials.
  - .2 Ventilate temporary sanitary facilities.
  - .3 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

- .6 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.
- .7 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

#### **1.6 TEMPORARY POWER AND LIGHT**

- .1 Contractor to 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.
- .4 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Departmental Representative provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

#### **1.7 TEMPORARY COMMUNICATION FACILITIES**

- .1 Provide and pay for temporary telephone, fax, data hook up, lines and equipment necessary for own use and use of Departmental Representative.

#### **1.8 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 REFERENCES**

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
  - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
  - .1 CSA A23.1-14/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 CSA-O121-08 (R2013), Douglas Fir Plywood.
  - .3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
  - .4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment.

**1.2 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit for approval Construction Site Usage Plan including Temporary Barriers and Enclosures with references to construction phasing if necessary.
- .3 No Work shall commence on site until written approval of Construction Site Usage Plan has been received by the Departmental Representative.

**1.3 INSTALLATION AND REMOVAL**

- .1 Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation.
- .2 Identify areas which have to be protected to prevent tracking of mud. Coordinate method of protection with Departmental representative.
- .3 Indicate use of supplemental or other staging area.
- .4 Provide construction facilities in order to execute work expeditiously.
- .5 Remove from site all such work after use.

**1.4 SCAFFOLDING**

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

**1.5 HOISTING**

- .1 Provide, operate and maintain hoists cranes required for moving of workers, materials and equipment. Make financial arrangements with Subcontractors for their use of hoists.
- .2 Hoists cranes to be operated by qualified operator.

**1.6 SITE STORAGE/LOADING**

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.
- .3 Construction lay-down areas and storage to be determined by Departmental Representative. Lay-down area to be provided.

#### **1.7 CONSTRUCTION PARKING**

- .1 Parking will be permitted on site provided it does not disrupt performance of Work or site operations. Designated areas to be determined by Departmental Representative.
- .2 Provide and maintain adequate access to project site.

#### **1.8 OFFICES**

- .1 Provide office heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size and furnished with drawing laydown table as coordinated with Departmental Representative.
- .2 Provide marked and fully stocked first-aid case in a readily available location.

#### **1.9 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.
- .3 Permanent facilities may be used on approval of Departmental Representative.

#### **1.10 CONSTRUCTION SIGNAGE**

- .1 At the discretion of the Departmental Representative, the size, fastening, wording and design of a project sign may be given for posting at any time during the Work.
- .2 No other signs or advertisements, other than warning/safety precaution signs, are permitted on site.

#### **1.11 PROTECTION AND MAINTENANCE OF TRAFFIC**

- .1 Provide access and temporary relocated roads as necessary to maintain traffic.
- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by Departmental Representative.
- .3 Provide measures for protection and diversion of traffic, including erection of barricades, and erection and maintenance of adequate warning, danger, and direction signs.
- .4 Contractor's traffic on roads selected for hauling material to and from site to interfere as little as possible with public and site traffic.
- .5 Verify adequacy of existing roads and allowable load limit on these roads. Contractor: responsible for repair of damage to roads caused by construction operations.

**1.12 CLEAN-UP**

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1**

**General**

**1.1 REFERENCES**

**1.2 INSTALLATION AND REMOVAL**

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

**1.3 CONSTRUCTION BARRIERS, FENCING AND HOARDING**

- .1 Erect temporary site enclosures without digging or pounding into the ground.
- .2 Provide barriers around trees and plants designated to remain. Protect from damage by equipment and construction procedures.
- .3 Construction barriers are required to protect the public and/or animals, to protect Work in progress and to delimit areas of Work.
- .4 Provide heating and hoarding to protect building elements and Work that require minimum temperatures in the winter season.
  - .1 Concrete work
  - .2 Masonry work
  - .3 Work with epoxies
  - .4 Pre-treatment and painting work (note that both sides of the wall --- interior and exterior-- may need to be heated).

**1.4 GUARD RAILS AND BARRICADES**

- .1 Provide secure, rigid guard rails and barricades around deep excavations, and open edges of roofs.

**1.5 WEATHER ENCLOSURES**

- .1 Provide weather tight closures to unfinished door and window openings and other openings in floors and roofs.
- .2 Close off areas where walls are not finished; seal off other openings.
- .3 Design enclosures to withstand wind pressure and snow loading.

**1.6 ACCESS TO SITE**

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

**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.

**1.9 PROTECTION OF BUILDING FINISHES**

- .1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.
- .2 Provide necessary screens, covers, and hoardings.
- .3 Be responsible for damage incurred due to lack of or improper protection.
- .4 Departmental Representative will determine minimum distances from buildings for safe operation of equipment and scaffolding to prevent damage to historical resources. Confirm with Departmental Representative prior to commencement of any Work.

**1.10 WASTE MANAGEMENT AND DISPOSAL**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1        Within the text of each specifications section, reference may be made to reference standards.
- .2        Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3        If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4        Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

**1.2                QUALITY**

- .1        Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
- .2        Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
- .3        Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
- .4        Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5        Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6        Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

**1.3                AVAILABILITY**

- .1        Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify Departmental Representative of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.
- .2        In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

#### **1.4 STORAGE, HANDLING AND PROTECTION**

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
- .6 Store sheet materials, lumber and roofing materials on flat, solid supports and keep clear of ground. Slope to shed moisture.
- .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
- .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

#### **1.5 TRANSPORTATION**

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

#### **1.6 MANUFACTURER'S INSTRUCTIONS**

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

#### **1.7 QUALITY OF WORK**

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative whose decision is final.

**1.8 CO-ORDINATION**

- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
- .2 Be responsible for coordination and placement of openings, sleeves and accessories.

**1.9 REMEDIAL WORK**

- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
- .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

**1.10 FASTENINGS**

- .1 Provide metal fastenings and accessories in same texture, colour, size, shape and fastening method as adjacent, unless indicated otherwise.
- .2 Prevent electrolytic action between dissimilar metals and materials. Use compatible materials or separate dissimilar metals using methods approved by Departmental Representative.
- .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.
- .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
- .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
- .6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

**1.11 PROTECTION OF WORK IN PROGRESS**

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

**1.12 EXISTING UTILITIES**

- .1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, other buildings on site, operations on site and pedestrian and vehicular traffic.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3            Execution**

**3.1                NOT USED**

.1                Not Used.

**END OF SECTION**

**Part 1**

**General**

**1.1 REFERENCES**

- .1 Owner's identification of existing survey control points and property limits.

**1.2 QUALIFICATIONS OF SURVEYOR**

- .1 Qualified registered land surveyor, licensed to practice in Place of Work, acceptable to Departmental Representative.

**1.3 SURVEY REFERENCE POINTS**

- .1 Existing base horizontal and vertical control points are designated on drawings.
- .2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.
- .3 Make no changes or relocations without prior written notice to Departmental Representative.
- .4 Report to Departmental Representative when reference point is lost or destroyed, or requires relocation because of necessary changes in grades or locations.
- .5 Require surveyor to replace control points in accordance with original survey control.

**1.4 SURVEY REQUIREMENTS**

- .1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.
- .2 Establish lines and levels, locate and lay out, by instrumentation.
- .3 Stake for grading, fill and topsoil placement and landscaping features.
- .4 Stake slopes and berms.
- .5 Stake batter boards for foundations.
- .6 Precisely locate all pilings.

**1.5 EXISTING SERVICES**

- .1 Before commencing work, establish location and extent of service lines in area of Work and notify Departmental Representative of findings.
- .2 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Departmental Representative.

**1.6 LOCATION OF EQUIPMENT AND FIXTURES**

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Departmental Representative of impending installation and obtain approval for actual location.

- .4 Submit field drawings to indicate relative position of various services and equipment when required by Departmental Representative.

**1.7 RECORDS**

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Upon completion of piling, survey offsets and top of pile elevations of installed piles to confirm that they are within specified tolerances.
- .3 Record locations of maintained, re-routed and abandoned service lines.

**1.8 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit name and address of Surveyor to Departmental Representative.
- .2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.
- .3 Submit piling installation survey to Departmental Representative for review prior to proceeding with Work.

**1.9 SUBSURFACE CONDITIONS**

- .1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.
- .2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                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 is not detailed in the Contract 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        Required for original installation.
- .2        Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures.

**1.3                PREPARATION**

- .1        Inspect existing conditions, including elements subject to damage or movement during cutting and patching.
- .2        After uncovering, inspect conditions affecting performance of Work.
- .3        Beginning 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.
- .8 Restore work with new products in accordance with requirements of Contract Documents.
- .9 Fit Work airtight to pipes, sleeves, conduit, and other penetrations through surfaces.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                PROJECT CLEANLINESS**

- .1        For worker health and safety reasons clean interior areas of harmful substances prior to start of work according to provincial regulations.
- .2        Maintain Work in tidy condition, free from accumulation of waste products and debris, including other than that caused by Owner or other Contractors.
- .3        Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .4        Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .5        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .6        Provide on-site covered containers for collection of waste materials and debris.
- .7        Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .8        Dispose of waste materials and debris off site.
- .9        Clean interior areas prior to start of finishing work, and maintain areas free of dust and other contaminants during finishing operations.
- .10       Store volatile waste in covered metal containers, and remove from premises at end of each working day.
- .11       Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
- .12       Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
- .13       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 other than including that caused by Owner.
- .5        Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.
- .6        Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7        Clean glass and electrical fixtures. Replace broken, scratched or disfigured glass.

- .8 Remove dirt from electrical fixtures.
- .9 Broom clean and dust building interiors on exposed structural members.
- .10 Rake clean gravel surfaces.
- .11 Remove dirt from exterior surfaces.
- .12 Clean and sweep roofs.
- .13 Remove snow and ice from access to building.

**1.3 WASTE MANAGEMENT AND DISPOSAL**

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

**Part 2 Products**

**2.1 NOT USED**

- .1 Not Used.

**Part 3 Execution**

**3.1 NOT USED**

- .1 Not Used.

**END OF SECTION**

**Part 1            General**

**1.1                WASTE MANAGEMENT GOALS**

- .1        Prior to start of Work conduct meeting with Departmental Representative to review and discuss PWGSC's waste management goal and Contractor's proposed Waste Reduction Workplan for Construction, Renovation and /or Demolition (CRD) waste to be project generated.
- .2        PWGSC's waste management goal: to divert a minimum 75 percent of total Project Waste from landfill sites. Prior to project completion provide Departmental Representative documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced. The overall waste diversion goal for this project is to divert wood shingles from going to landfill, responsible reuse and removal of soil, and recycling of packaging and beverage containers during construction.
- .3        Target percentage goals are achievable for waste diversion. Contractor to review and confirm Departmental Representative's Waste Audit acceptable values.
- .4        Minimize amount of non-hazardous solid waste generated by project and accomplish maximum source reduction, reuse and recycling of solid waste produced by CRD activities.
- .5        Protect environment and prevent environmental pollution damage.

**1.2                RELATED REQUIREMENTS**

- .1        Section 07 31 29 Wood Shingles.

**1.3                REFERENCES**

- .1        Definitions:
  - .1        Approved/Authorized recycling facility: waste recycler approved by applicable provincial authority or other users of material for recycling approved by the Departmental Representative.
  - .2        Class III: non-hazardous waste - construction renovation and demolition waste.
  - .3        Construction, Renovation and/or Demolition (CRD) Waste: Class III solid, non-hazardous waste materials generated during construction, demolition, and/or renovation activities
  - .4        Cost/Revenue Analysis Workplan (CRAW): based on information from Waste Reduction Workplan, and intended as financial tracking tool for determining economic status of waste management practices (Schedule E).
  - .5        Inert Fill: inert waste - exclusively asphalt and concrete.
  - .6        Waste Source Separation Program (WSSP): implementation and co-ordination of ongoing activities to ensure designated waste materials will be sorted into pre-defined categories and sent for recycling and reuse, maximizing diversion and potential to reduce disposal costs.
  - .7        Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
  - .8        Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.

- .9 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.
- .10 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.
- .11 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .12 Separate Condition: refers to waste sorted into individual types.
- .13 Source Separation: act of keeping different types of waste materials separate beginning from the point they became waste.
- .14 Waste Audit (WA): detailed inventory of estimated quantities of waste materials that will be generated during construction, demolition, deconstruction and/or renovation. Involves quantifying by volume/weight amounts of materials and wastes that will be reused, recycled or landfilled. Refer to Schedule A.
- .15 Waste Diversion Report: detailed report of final results, quantifying cumulative weights and percentages of waste materials reused, recycled and landfilled over course of project. Measures success against Waste Reduction Workplan (WRW) goals and identifies lessons learned.
- .16 Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating required submittal and reporting requirements.
- .17 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials generated by project. Specifies diversion goals, implementation and reporting procedures, anticipated results and responsibilities. Waste Reduction Workplan (Schedule B) information acquired from Waste Audit.

#### **1.4 DOCUMENTS**

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

#### **1.5 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare and submit following prior to project start-up:
  - .1 1 copy and 1 electronic copy of completed Waste Reduction Workplan (WRW).
- .3 Submit prior to final payment the following:
  - .1 Waste Diversion Report, indicating final quantities in tones by material types salvaged for reuse, recycling or disposal in landfill and recycling centres, re-use

depots, landfills and other waste processors that received waste materials.

## **1.6 WASTE REDUCTION WORKPLAN (WRW)**

- .1 Prepare and submit WRW at least 10 days prior to project start-up.
- .2 WRW identifies strategies to optimize diversion through reduction, reuse, and recycling of materials and comply with applicable regulations, based on information acquired from WA.
- .3 WRW should include but not limited to:
  - .1 Applicable regulations.
  - .2 Specific goals for waste reduction, identify existing barriers and develop strategies to overcome them.
  - .3 Destination of materials identified.
  - .4 Deconstruction/disassembly techniques and schedules.
  - .5 Methods to collect, separate, and reduce generated wastes.
  - .6 Location of waste bins on-site.
  - .7 Security of on-site stock piles and waste bins.
  - .8 Protection of personnel, sub-contractors.
  - .9 Clear labelling of storage areas.
  - .10 Training plan for contractor and sub-contractors.
  - .11 Methods to track and report results reliably.
  - .12 Details on materials handling and removal procedures.
  - .13 Recycler and reclaimer requirements.
  - .14 Quantities of materials to be salvaged for reuse or recycled and materials sent to landfill.
  - .15 Requirements for monitoring on-site wastes management activities.
- .4 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
- .5 Post WRW or summary where workers at site are able to review content.
- .6 Monitor and report on waste reduction by documenting total volume (in tonnes) and cost of actual waste removed from project.

## **1.7 USE OF SITE AND FACILITIES**

- .1 Execute Work with minimal interference and disturbance to normal use of premises.
- .2 Maintain security measures established by facility provide temporary security measures approved by Departmental Representative.

## **1.8 WASTE PROCESSING SITES**

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

## **1.9 QUALITY ASSURANCE**

- .1 After award of Contract, a mandatory site examination will be held for this Project for Contractor and/or sub-contractors responsible for construction, renovation demolition/deconstruction waste management.
  - .1 Date, time and location will be arranged by Departmental Representative.
- .2 Waste Management Meeting: Waste Management Co-ordinator is to provide an update on status of waste diversion and management activities at each meeting. Written Waste Diversion Report summary to be provided by Waste Management Coordinator at the completion of the project.

## **1.10 STORAGE, HANDLING AND PROTECTION**

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Protect, stockpile, store and catalogue salvaged items.
- .4 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .5 Protect structural components not removed and salvaged materials from movement or damage.
- .6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Departmental Representative.
- .7 Protect surface drainage, mechanical and electrical from damage and blockage.
- .8 Provide on-site facilities and containers for collection and storage of reusable and recyclable materials.
- .9 Separate and store materials produced during project in designated areas.
- .10 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated processing facilities.
  - .1 On-site source separation is recommended.
  - .2 Remove co-mingled materials to off site processing facility for separation.
  - .3 Obtain waybills, receipts and/or scale tickets for separated materials removed from site.
  - .4 Materials reused on-site are considered to be diverted from landfill and as such are to be included in all reporting.

## **1.11 DISPOSAL OF WASTES**

- .1 Do not bury or spread on site rubbish or waste materials.
- .2 Do not dispose of waste volatile materials mineral spirits oil paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
  - .1 Number and size of bins.

- .2 Waste type of each bin.
- .3 Total tonnage generated.
- .4 Tonnage reused or recycled.
- .5 Reused or recycled waste destination.
- .4 Remove materials on-site as Work progresses.

### **1.12 SCHEDULING**

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

## **Part 2 Products**

### **2.1 NOT USED**

- .1 Not Used.

## **Part 3 Execution**

### **3.1 APPLICATION**

- .1 Do Work in compliance with WRW and WSSP.
- .2 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

### **3.2 CLEANING**

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

### **3.3 DIVERSION OF MATERIALS**

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
  - .1 Mark containers or stockpile areas.
  - .2 Provide instruction on disposal practices.
- .2 On-site sale of salvaged or recyclable materials are not permitted.

### **3.4 WASTE DIVERSION REPORT**

- .1 At completion of Project, prepare written Waste Diversion Report indicating quantities of materials reused, recycled or disposed of as well as the following:
  - .1 Identify final diversion results and measure success against goals from Waste Reduction Workplan.
  - .2 Compare final quantities/percentages diverted with initial projections in Waste Reduction Workplan and explain variances.
    - .1 Supporting documentation.
    - .2 Waybills and tracking forms.
    - .3 Description of issues, resolutions and lessons learned.

### **3.5 EMERGENCIES**

- .1 In case of emergencies, RMNP Dispatch is to be contacted immediately at 1-877-852-3100 as well as notifying the Project Authority and the ESO.

**END OF SECTION**

**Part 1            General**

**1.1                PRECEDENCE**

- .1            For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

**1.2                RELATED REQUIREMENTS**

- .1            Section 01 78 00 – Closeout Submittals.

**1.3                INSPECTION AND DECLARATION**

- .1            Contractor’s Inspection: Contractor and all sub-contractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
  - .1            Notify Project Authority in writing of satisfactory completion of Contractor’s Inspection and that corrections have been made.
  - .2            Request Project Authority's Inspection.
- .2            Project Authority's Inspection: Project Authority and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor shall 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            Final Inspection: when items noted above are completed, request final inspection of Work by Project Authority, and Contractor. If Work is deemed incomplete by Project Authority, complete outstanding items and request re-inspection.

**Part 2            Products**

**2.1                NOT USED**

- .1            Not Used.

**Part 3            Execution**

**3.1                NOT USED**

- .1            Not Used.

**END OF SECTION**

**Part 1 GENERAL**

**1.1 PRECEDENCE**

- .1 For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions of this Project Manual.

**1.2 RELATED REQUIREMENTS**

- .1 Section 01 33 00 – Submittal Procedures.
- .2 Section 01 45 00 – Quality Control.
- .3 Section 01 77 00 – Closeout Procedures.

**1.3 RECORDING ACTUAL SITE CONDITIONS**

- .1 Contractor to provide as built drawings to Project Authority at project completion.
- .2 Contract Drawings: legibly mark each item to record actual construction, including:
  - .1 Field changes of dimension and detail.
  - .2 Changes made by change orders.
  - .3 Details not on original Contract Drawings.
  - .4 References to related shop drawings and modifications.
- .3 Specifications: legibly mark each item to record actual construction, including:
  - .1 Changes made by Addenda and change orders.

**1.4 WARRANTIES AND BONDS**

- .1 All work is to be warranted for a period of one year after all deficiencies identified during final inspection have been rectified.

**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                SUMMARY**

- .1            This Section includes requirements for historic structure relocation.

**1.2                RELATED REQUIREMENTS**

- .1            Section 02 41 13 – Selective Demolition
- .2            Section 02 42 00 - Removal and Salvage of Construction Materials

**1.3                REFERENCE STANDARDS**

- .1            Canada's Historic Places:
  - .1            Standards and Guidelines for the Conservation of Historic Places in Canada

**1.4                PERFORMANCE REQUIREMENTS**

- .1            Safe support of existing structure and construction live loads to allow work to be accomplished.
- .2            Compliance with requirements of municipal, provincial, and federal Authorities regulating construction, including codes.
- .3            Deviation of levels: maximum deviation of structure not more than 8 mm from one corner to the opposite corner as required to align the structure in accordance with the procedure specified and to place the structure on a level foundation.

**1.5                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Provide drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada in accordance with Section 01 33 00 - Submittal Procedures.
  - .1            Shop drawings.
  - .2            Provide schematic drawings showing suggested alternative specific procedure for raising or moving of structure.
  - .3            Provide drawings of shoring, bracing and temporary framing including lifting points to Departmental Representative for review.
  - .4            Provide identification of numbering system and recording of photographs and dimensions for components to be temporarily removed.
  - .5            Provide lifting and moving schedule in accordance with Section 01 33 00 - Submittal Procedures.
  - .6            Submit record drawings in accordance with Section 01 33 00 - Submittal Procedures and Section 01 78 00 - Closeout Submittals.

**1.6                QUALIFICATIONS**

- .1            Contractor undertaking work in this section is required to be skilled and trained and to have experience in this field.

- .2 Submit written information including resumes, Certificates of Qualification as may be applicable and references for review and approval by Departmental Representative before commencing Work.
- .3 Workers accepted by Departmental Representative will be permitted to execute Work.

### **1.7 REGULATORY REQUIREMENTS**

- .1 Obtain necessary permits and regulatory approvals prior to commencing work.

### **1.8 EXISTING CONDITIONS**

- .1 Refer to Contract Drawings showing existing conditions.

### **1.9 SCHEDULING**

- .1 Submit schedule of activities, showing dates and duration to Departmental Representative no later than 15 days before moving work.
- .2 Co-ordinate moving procedure with scheduled work with other trades, providing access and assistance as required.
- .3 Notify Departmental Representative in writing 2 working days before starting work, and before raising and moving, and before lowering structure, and on completion of work.

### **1.10 WASTE MANAGEMENT AND DISPOSAL**

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

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Temporary braces, tie-rods, clamps, supports and crates: constructed in accordance with plans prepared by contractor. Take possession of items and remove from site.

### **2.2 ACCESSORIES**

- .1 Provide equipment for safe moving, and careful transport, storage and re-founding of building and its related parts.
- .2 Provide equipment and supports suitable for support of entire structure without exceeding deformation tolerance, subsidence or collapse.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Before starting work verify existing conditions and variations from Contract Documents and notify Departmental Representative.
- .2 Survey site and establish a minimum of two temporary benchmarks and elevation of existing floor. The final elevation of the building to be determined on site by contractor and approved by Departmental Representative (final elevation to vary +/- 200 mm from existing)
- .3 Request direction from Departmental Representative regarding protection and security of

artifacts and objects.

### **3.2 PREPARATION**

- .1 Support separate components securely to prevent damage.
- .2 Strap and brace independent or unstable elements as per reviewed shop drawings.
- .3 Provide and install temporary braces, struts, tie rods, partitions, supports and other installations necessary for safe moving of structure to ensure integral preservation of existing materials and structure.
- .4 Temporarily block exterior openings during moving and storage.
- .5 Ensure that temporary measures taken are reversible and no permanent unintended deformation or scarring of historic fabric result from this work. Do not nail, drill holes or otherwise permanently alter historic building components. Any deviations required approval by the Departmental Representative.
- .6 Verify dimensions of new footings, foundations matching dimensions of moved building with tolerances.
- .7 Verify co-ordination of construction joints, support points in new foundations, key elevation points.

### **3.3 PROTECTION**

- .1 Protect existing structure elements and building fabric from damage.
  - .1 Submit method of protection with shop drawings.
- .2 Catalogue and Photograph and label items related to structure, and its site, which may be displaced or affected during course of work. Transport and store these items onsite.
- .3 Verify suitability of conditions for moving structures. Maintain continued structural stability during and after lifting and/or transport.
- .4 Verify suitability of conditions at destination site before moving.
- .5 Obtain approval of protection measures from Departmental Representative prior to commencing work.
- .6 Ventilate structure during construction

### **3.4 CONSERVATION PROCEDURES**

- .1 Identification:
  - .1 Establish numbering system for components as required, and mark numbered components on 2 copies of drawings. Submit to Departmental Representative for review.
  - .2 Identify and mark detached pieces and structural components as they are found.
  - .3 Identify wooden items with lettering tape at two locations on items.
  - .4 Identify metal items with tags.
  - .5 Attach visible and non-perishable labels and tags permanently. Locate for easy access during storage and reconstruction.
  - .7 Prepare and produce photographic record of structure, before dismantling, to facilitate reassembly.

- .2 Connections:
  - .1 Use clamping systems or other similar methods to attach lifting devices to the historic structure.
  - .2 Do not nail, drill or in any way permanently alter the historic structure during the lifting process. Any deviations required approval by the Departmental Representative.
- .3 Dismantling:
  - .1 Remove components and structural parts in sequence.
  - .2 Place components in storage in clear relation one to another.
  - .3 Place visible non-perishable labels on components during storage.
- .4 Transportation:
  - .1 Follow procedure approved by Departmental Representative for structure moving and storage.
  - .2 Proceed according to approved schedule to completion.

### **3.5 RE-INSTALLATION**

- .1 Ensure new foundation has been properly prepared. Verify the site will accept the moved structure.
- .2 Assume responsibility for structure and related components until re-installation is completed on destination site.
- .3 Plan and co-ordinate activities of related trades before work of final installation starts.
- .4 Provide temporary protection, unless otherwise instructed.
- .5 Install structure at destination location and align within following tolerances: 6mm in plan and in elevation.
- .6 Leave temporary bracing, closures and other installations for moving in place until removal is authorized, in writing, by Departmental Representative.
- .7 Repair and make good damage as directed by Departmental Representative.

### **3.6 CLEANING**

- .1 Structure:
  - .1 Remove temporary marking tags, labels from completed work.
- .2 Original site:
  - .1 Clear debris and ensure site is in neat and safe condition.
  - .2 Ensure site is clean and restored to its original state.
- .3 Destination site:
  - .1 Remove unattached materials and equipment; leave site in clean and safe condition.

**END OF SECTION**

**Part 1            General**

**1.1                PRICE AND PAYMENT PROCEDURES**

- .1            No measurement will be made under this Section.

**1.2                REFERENCES**

- .1            Definitions:
  - .1            Demolition: rapid destruction of building following removal of hazardous materials.
  - .2            Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.
  - .3            Waste Audit (WA): detailed inventory of materials in building. Indicates quantities of reuse, recycling and landfill.
    - .1            Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project.
    - .2            Indicates quantities of reuse, recycling and landfill.
  - .4            Waste Management Coordinator (WMC): contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
  - .5            Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. WRW is based on information acquired from WA.
- .2            Reference Standards:
  - .1            Canadian Council of Ministers of the Environment (CCME)
  - .2            Health Canada/Workplace Hazardous Materials Information System (WHMIS)
    - .1            Material Safety Data Sheets (MSDS).
- .3            Transport Canada (TC)
  - .1            Transportation of Dangerous Goods Act, 1992 (TDGA), c. 34.

**1.3                ADMINISTRATIVE REQUIREMENTS**

- .1            Site Meetings.
  - .1            Convene pre-demolition meeting one week prior to beginning work of this Section in accordance with Section 01 31 00 – Project Management and Coordination to:
    - .1            Verify project requirements.
    - .2            Review installation and substrate conditions.
    - .3            Co-ordination with other building sub-trades.
    - .4            Review manufacturer's installation instructions and warranty requirements.

- .2 Arrange for site visit with Departmental Representative to examine existing site conditions adjacent to demolition work, prior to start of Work.
  - .3 Hold project meetings bi-weekly.
  - .4 Ensure key personnel, site supervisor, project manager, subcontractor representatives and WMC attend.
  - .5 Reporting Requirements: WMC to complete.
  - .6 WMC must provide verbal report on status of waste diversion activity at each meeting.
  - .7 Departmental Representative will provide written notification of change of meeting schedule established upon contract award 24 hours prior to scheduled meeting.
- .2 Scheduling: meet project time lines without compromising specified minimum rates of material diversion.
    - .1 Notify Departmental Representative in writing when unforeseen delays occur.

#### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Shop Drawings:
  - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  - .2 Submit for approval drawings, diagrams or details showing sequence of demolition work and supporting structures, where required by authorities having jurisdiction.
- .3 Hazardous Materials:
  - .1 Provide description of Hazardous Materials and Notification of Filing with proper authorities prior to beginning of Work as required.
- .4 Waste Reduction Workplan:
  - .1 Prior to beginning of Work on site submit detailed Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal and indicate:
    - .1 Descriptions of and anticipated quantities in percentages of materials to be salvaged reused, recycled and landfilled.
    - .2 Schedule of selective demolition.
    - .3 Number and location of dumpsters.
    - .4 Anticipated frequency of tippage.
    - .5 Name and address of haulers, waste facilities, and/or waste receiving organizations.
- .5 Certificates:
  - .1 Submit copies of certified weigh bills from authorized disposal sites and reuse and recycling facilities for material removed from site on monthly basis upon request of Departmental Representative.

- .2 Written authorization from Departmental Representative is required to deviate from, facilities or receiving organizations listed in Waste Reduction Workplan.

## **1.5 QUALITY ASSURANCE**

- .1 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and applicable Provincial regulations.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Store and manage hazardous materials in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Storage and Protection.
  - .1 Protect in accordance with Section 31 00 99 – Earthwork for Minor Works.
  - .2 Protect existing items designated to remain and items designated for salvage. In event of damage to such items, immediately replace or make repairs to approval of Departmental Representative and at no cost to Departmental Representative.
  - .3 Remove and store materials to be salvaged, in manner to prevent damage.
  - .4 Store and protect in accordance with requirements for maximum preservation of material.
  - .5 Handle salvaged materials as new materials.
- .3 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.7 SITE CONDITIONS**

- .1 Site Environmental Requirements.
  - .1 Perform work in accordance with Section 01 35 43 - Environmental Procedures.
  - .2 Ensure that selective demolition work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
  - .3 Do not dispose of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers.
    - .1 Ensure proper disposal procedures are maintained throughout the project.
  - .4 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers or onto adjacent properties.
  - .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authorities as directed by Departmental Representative.
  - .6 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .2 Existing Conditions.
  - .1 Remove contaminated or hazardous materials listed as hazardous as defined by

authorities having jurisdiction from site, prior to start of demolition Work, and dispose of at designated disposal facilities in safe manner in accordance with TDGA and other applicable regulatory requirements.

- .2 List of potentially hazardous materials:
  - .1 potentially lead-containing paint.
  - .2 potentially mould-containing wood.
  - .3 potentially guano from animals.

## **Part 2 PRODUCTS**

### **2.1 EQUIPMENT**

- .1 Leave machinery running only while in use, except where extreme temperatures prohibit shutting machinery down.

## **Part 3 EXECUTION**

### **3.1 PREPARATION**

- .1 Inspect site with Departmental Representative and verify extent and location of items designated for removal, disposal, alternative disposal, recycling, salvage and items to remain.
- .2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.
- .3 Notify and obtain approval of utility companies before starting demolition.

### **3.2 REMOVAL OF HAZARDOUS WASTES**

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

### **3.3 REMOVAL OPERATIONS**

- .1 Remove items as indicated.
- .2 Do not disturb items designated to remain in place.
- .3 Stockpile topsoil for final grading and landscaping:
  - .1 Provide erosion control and seeding if not immediately used.
- .4 Salvage:
  - .1 Items to be salvaged: temporary structural posts.
  - .2 Dismantle items containing materials for salvage and stockpile salvaged materials at locations as indicated.
- .5 Disposal of Material:
  - .1 Dispose of materials not designated for salvage or reuse on site as instructed by Departmental Representative at authorized facilities approved in Waste Reduction Workplan.

- .6 Backfill:
  - .1 Backfill in areas as indicated and in accordance with Section 31 00 99 – Earthwork for Minor Works.

### **3.4 STOCKPILING**

- .1 Stockpile topsoil in accordance with Section 31 00 99 - Earthwork for Minor Works.
- .2 Label stockpiles, indicating material type and quantity.
- .3 Designate appropriate security resources/measures to prevent vandalism, damage and theft.
- .4 Locate stockpiled materials convenient for use in new construction to eliminate double handling wherever possible.
- .5 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

### **3.5 REMOVAL FROM SITE**

- .1 Remove stockpiled material as directed by Departmental Representative, when it interferes with operations of project.
- .2 Remove stockpiles of like materials by alternate disposal option once collection of materials is complete.
- .3 Transport material designated for alternate disposal using approved haulers, facilities and receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.
  - .1 Written authorization from Departmental Representative is required to deviate from facilities, receiving organizations listed in Waste Reduction Workplan.
- .4 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
  - .1 Disposal Facilities: approved and listed in Waste Reduction Workplan.
  - .2 Written authorization from Departmental Representative DCC Representative Consultant is required to deviate from disposal facilities listed in Waste Reduction Workplan.
- .5 Remove and dispose existing concrete foundation, floor slab, etc.
- .6 Remove and dispose of excavated soil.

### **3.6 RESTORATION**

- .1 Restore landscaped areas and existing works outside areas of demolition or Work to conditions that existed prior to beginning of Work match condition of adjacent, undisturbed areas, or to directions received by Departmental Representative.
- .2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.

### **3.7 CLEANING**

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

- .1 Leave Work area clean at end of each day.
  - .2 Remove debris, trim surfaces and leave work site clean, upon completion of Work
  - .3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses or ground water.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
    - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.8 PROTECTION**

- .1 As the site and many of the buildings on site are considered to have heritage value, consult with Departmental Representative about damages to adjacent materials, landscaping or buildings caused by selective site demolition. Repair of damages to buildings outside the scope of this Work is likely to cause substantial delays to schedules as procedures and methods of repairs will be reviewed by FHBRO as well as the project team.
- .2 All other elements of the building which are not expected to be altered shall be protected adequately from damage. Coordinate all protection of building elements with Departmental Representative.
- .3 Landscape and buildings outside the area of Work may need to be protected from damage. Coordinate with Departmental Representative.

**END OF SECTION**

**Part 1            General**

**1.1                SUMMARY**

- .1        This Section includes requirements for careful removal and salvage, and reconditioning of building components identified for storage at a designated remote site for storage on site and subsequent reinstallation forming a part of Project ready for re use at a later date.

**1.2                RELATED REQUIREMENTS**

- .1        Section 02 03 43 – Period Structure Relocating
- .2        Section 02 41 13 – Selective Demolition

**1.3                DEFINITIONS**

- .1        Remove and Salvage: Detach items from existing construction and deliver them to Departmental Representative.
- .2        Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

**1.4                ADMINISTRATIVE REQUIREMENTS**

- .1        Coordination Existing Salvaged Work: Coordinate with Departmental Representative for confirmation of materials, components, and items of equipment identified for removal and salvage from their present existing locations and as follows:
  - .1        Items that are turned over to Departmental Representative.
  - .2        On-site storage locations.
  - .3        Confirmation of items that are renovated or refurbished ready for reinstallation as a part of Work.
  - .4        Confirmation of items that Departmental Representative will not re use, but will retain as follows:
    - .1        Departmental Representative will pick-up identified salvaged items from a designated location on site.

**Part 2            PRODUCTS**

**2.1                SALVAGED ITEMS**

- .1        All existing mechanical and electrical equipment shall be salvaged and stored for reinstallation by Contractor.
- .2        Any required dismantled brickwork of the chimney shall be dismantled, salvaged and stored for reinstallation by the Contractor.
- .3        Wooden support posts of the basement shall be salvaged by the contractor and retained by the Departmental Representative.
- .4        Confirm with Departmental Representative additional items that appear salvageable prior to disposal.

**Part 3 EXECUTION**

**3.1 SALVAGE**

- .1 Remove and handle salvageable items from site to minimize damage and to ensure that usability is maintained.
- .2 Clean, decontaminate, or remediate hazardous substances (lead based paint, asbestos dust, PCB residue, and similar substances) from salvaged materials so they are safe for reuse.
- .3 Place materials on palettes or wrap in protective film to ensure that loose pieces and projections do not cause injury to personnel, and that salvaged items remain as complete units.
- .4 Clean items of construction or building debris, or materials that are not a part of salvaged work.

**3.2 REINSTALLATION**

- .1 Reinstall salvaged items as directed by the Departmental Representative.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 03 20 00 – Concrete Reinforcing
- .2    Section 03 30 00 – Cast-in-Place Concrete
- .3    Section 03 35 00 – Concrete Finishing

**1.2                REFERENCES**

- .1    Canadian Standards Association (CSA International)
  - .1    CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2    CSA-O86-14, Engineering Design in Wood.
  - .3    CSA O121-08 (R2013) - Douglas Fir Plywood.
  - .4    CSA O151-09 (R2014) - Canadian Softwood Plywood.
  - .5    CSA O153-13 - Poplar Plywood.
  - .6    CAN/CSA-O325.0-92(R2003), Construction Sheathing.
  - .7    CAN/CSA-S269.3-M92 (R2013) - Concrete Formwork, National Standard of Canada
- .2    Underwriters' Laboratories of Canada (ULC)
  - .1    CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Submit shop drawings for formwork and falsework.
- .3    Indicate method and schedule of construction, shoring, stripping and re-shoring procedures, materials, arrangement of joints, special architectural exposed finishes, ties, liners, and locations of temporary embedded parts. Comply with CAN/CSA-S269.3 for formwork drawings.
- .4    Indicate formwork design data: permissible rate of concrete placement, and temperature of concrete, in forms.

**1.4                DELIVERY, STORAGE AND HANDLING**

- .1    Store and manage hazardous materials in accordance with Section 01 35 43 - Environmental Procedures.
- .2    Waste Management and Disposal:
  - .1    Separate waste materials for reuse and recycling in accordance with Section 01 47 21 - Construction/Demolition Waste Management and Disposal.
  - .2    Place materials defined as hazardous or toxic in designated containers.
  - .3    Divert wood materials from landfill to a recycling reuse facility as approved by Departmental Representative.

- .4 Divert plastic materials from landfill to a recycling facility as approved by Departmental Representative.
- .5 Divert unused form release material from landfill to an official hazardous material collections site as approved by the Departmental Representative.

## **Part 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Materials and resources in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Formwork materials:
  - .1 For concrete without special architectural features, use wood and wood product formwork materials to CSA-O121.
  - .2 Rigid insulation board: to CAN/ULC-S701.
- .3 Form ties:
  - .1 For concrete not designated as exposed to view, use removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface.
  - .2 For concrete to be exposed to view, do not use ties on surfaces designated as exposed.
- .4 Form release agent: non-toxic, biodegradable, low VOC.
- .5 Form stripping agent: colourless mineral oil, non-toxic, biodegradable, low VOC, free of kerosene, with viscosity between 70 and 110s Saybolt Universal 15 to 24 mm<sup>3</sup> /s at 40 degrees C, flashpoint minimum 150 degrees C, open cup.

## **Part 3 EXECUTION**

### **3.1 FABRICATION AND ERECTION**

- .1 Verify lines, levels and centres before proceeding with formwork and ensure dimensions agree with drawings.
- .2 Obtain Departmental Representative's approval for use of earth forms framing openings not indicated on drawings.
- .3 Hand trim sides and bottoms and remove loose earth from earth forms before placing concrete.
- .4 Do not place shores and mud sills on frozen ground.
- .5 Provide site drainage to prevent washout of soil supporting mud sills and shores.
- .6 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.
- .7 Align form joints and make watertight.
  - .1 Keep form joints to minimum.
- .8 Form chases, slots, openings, drips, recesses, expansion and control joints as indicated.

- .9 Construct forms for exposed concrete, and place ties as indicated and as directed.
  - .1 Joint pattern not necessarily based on using standard size panels or maximum permissible spacing of ties.
- .10 Build in anchors, sleeves, and other inserts required to accommodate Work specified in other sections.
  - .1 Ensure that anchors and inserts will not protrude beyond surfaces designated to receive applied finishes.
- .11 Clean formwork in accordance with CSA-A23.1/A23.2, before placing concrete.

### **3.2 REMOVAL**

- .1 Leave formwork in place for following minimum periods of time after placing concrete.
  - .1 3 days for walls and pilasters.
  - .2 2 days for footings and abutments.
- .2 Remove formwork when concrete has reached 50% of its design strength or minimum period noted above, whichever comes later, and protect.
- .3 Re-use formwork and falsework subject to requirements of CSA-A23.1/A23.2.

**END OF SECTION**

**Part 1**

**General**

**1.1 RELATED REQUIREMENTS**

- .1 Section 03 10 00 – Concrete Forming and Accessories
- .2 Section 03 30 00 – Cast-in-Place Concrete
- .3 Section 03 35 00 – Concrete Finishing

**1.2 PRICE AND PAYMENT PROCEDURES**

- .1 Measurement and Payment:
  - .1 No measurement made under this Section.
  - .1 Include reinforcement costs in items of concrete work in Section 03 30 00 - Cast-In-Place Concrete.

**1.3 REFERENCE STANDARDS**

- .1 American Concrete Institute (ACI)
  - .1 SP-66-04, ACI Detailing Manual 2004.
- .2 ASTM International
  - .1 ASTM A1064/A1064M-15 Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete.
  - .2 ASTM A641/A641M-09a(2014), Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
- .3 CSA International
  - .1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
  - .2 A23.3-14 - Design of Concrete Structures.
  - .3 CSA-G30.18-09(R2014), Carbon Steel Bars for Concrete Reinforcement.
  - .4 G40.20-13/G40.21-13 - General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel.
- .4 Reinforcing Steel Institute of Canada (RSIC)
  - .1 RSIC-2004, Reinforcing Steel Manual of Standard Practice.

**1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare reinforcement drawings in accordance with RSIC-2004 Reinforcing Steel Manual of Standard Practice and SP-66(04) ACI Detailing Manual-2004.

**1.5 QUALITY ASSURANCE**

- .1 Submit in accordance with Section 01 45 00 - Quality Control and as described in PART 2 - SOURCE QUALITY CONTROL.
  - .1 Mill Test Report: upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel.

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

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Replace defective or damaged materials with new.

## **Part 2 PRODUCTS**

### **2.1 MATERIALS**

- .1 Substitute different size bars only if permitted in writing by Departmental Representative.
- .2 Reinforcing steel: weldable low alloy steel deformed bars, grade 400 (yield strength 400MPa), deformed bars to CSA-G30.18, unless indicated otherwise.
- .3 Cold-drawn annealed steel wire ties: to ASTM A 82/A 82M.
- .4 Welded steel wire fabric: to ASTM A 185/A 185M.
  - .1 Provide in flat sheets only.
- .5 Galvanizing of non-prestressed reinforcement: to CAN/CSA-G164
  - .1 Protect galvanized reinforcing steel with chromate treatment to prevent reaction with Portland cement paste.
  - .2 If chromate treatment carried out immediately after galvanizing, soak steel in aqueous solution containing minimum 0.2% by weight sodium dichromate or 0.2% chromic acid.
    - .1 Temperature of solution minimum 32 degrees and galvanized steels immersed for minimum 20 seconds.
  - .3 If galvanized steels at ambient temperature, add sulphuric acid as bonding agent at concentration of 0.5% to 1%.
    - .1 No restriction applies to temperature of solution.
  - .4 Chromate solution sold for this purpose may replace solution described above, provided if of equivalent effectiveness.
- .6 Chairs, bolsters, bar supports, spacers: to CSA-A23.1/A23.2.
- .7 Mechanical splices: subject to approval of Departmental Representative.

### **2.2 FABRICATION**

- .1 Fabricate reinforcing steel in accordance with CSA-A23.1/A23.2, SP-66 and Reinforcing Steel Manual of Standard Practice by the Reinforcing Steel Institute of Canada.

- .1 SP-66 unless indicated otherwise.
- .2 Obtain Departmental Representative's written approval for locations of reinforcement splices other than those shown on placing drawings.
- .3 Upon approval of Departmental Representative, weld reinforcement in accordance with CSA W186.
- .4 Ship bundles of bar reinforcement, clearly identified in accordance with bar bending details and lists.
  - .1 Ship epoxy coated bars in accordance with ASTM A934 / A934M.

### **2.3 SOURCE QUALITY CONTROL**

- .1 Upon request, provide Departmental Representative with certified copy of mill test report of reinforcing steel, showing physical and chemical analysis.
- .2 Upon request inform Departmental Representative of proposed source of supplied material.

## **Part 3 EXECUTION**

### **3.1 PREPARATION**

- .1 Galvanizing to include chromate treatment.
  - .1 Duration of treatment 1 hour per 25 mm of bar diameter.
- .2 Conduct bending tests to verify galvanized bar fragility in accordance with ASTM A143/A143M.

### **3.2 FIELD BENDING**

- .1 Do not field bend or field weld reinforcement except where indicated or authorized by Departmental Representative.
- .2 When field bending authorized, bend without heat, applying slow and steady pressure.
- .3 Replace bars, which develop cracks or splits.

### **3.3 PLACING REINFORCEMENT**

- .1 Place reinforcing steel as indicated on construction drawings and in accordance with CSA-A23.1/A23.2.
- .2 Upon placing of reinforcement steel and prior to placing concrete, obtain Departmental Representative's approval of reinforcing material and placement.
- .3 Maintain cover to reinforcement during concrete pour as per construction drawings.

### **3.4 FIELD TOUCH-UP**

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

### **3.5 FIELD QUALITY CONTROL**

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control

and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

- .1 Galvanized steel.
- .2 Reinforcing steel and welded wire fabric.
- .2 Inspection and testing of reinforcing and reinforcing materials carried out by testing laboratory designated by Departmental Representative for review to CSA A23.1/A23.2.
  - .1 Ensure testing laboratory certified to CSA A283.
- .3 Ensure test results distributed for discussion at pre-pouring concrete meeting between testing laboratory and Departmental Representative.

### **3.4 CLEANING**

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

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Section 03 10 00 – Concrete Forming and Accessories
- .2    Section 03 20 00 – Concrete Reinforcing
- .3    Section 03 35 00 – Concrete Finishing

**1.2                PRICE AND PAYMENT PROCEDURES**

- .1    Measurement and Payment:
  - .1    No measurements will be made for this Section.
  - .2    Cast-in-place concrete will not be measured but will be paid for as fixed price item.
  - .3    Supply and installation of galvanized anchor bolts, nuts and washers and bolt grouting will not be measured but considered incidental to work.

**1.3                REFERENCE STANDARDS**

- .1    ASTM International
  - .1    ASTM C260/C260M-10a, Standard Specification for Air-Entraining Admixtures for Concrete.
  - .2    ASTM C309-11 Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
  - .3    ASTM C494/C494M-15a Standard Specification for Chemical Admixtures for Concrete.
  - .4    ASTM C1017/C1017M-13e1 Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete.
- .2    Canadian General Standards Board (CGSB)
  - .1    CAN/CGSB-51.34-M86 (R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3    CSA International
  - .1    A23.1-14/A23.2-14 - Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete.
  - .2    CSA A283-06 (R2011), Qualification Code for Concrete Testing Laboratories.
  - .3    CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

**1.4                ABBREVIATIONS AND ACRONYMS**

- .1    Limestone Cement: hydraulic cement, blended hydraulic cement (XXb - b denotes blended) and Portland-limestone cement.
  - .1    Type GU, GUb and GUL - General use cement.
  - .2    Type MS and MSb - Moderate sulphate-resistant cement.
  - .3    Type MH, MHb and MHL - Moderate heat of hydration cement.

- .4 Type HE, HEb and HEL - High early-strength cement.
- .5 Type LH, LHb and LHL - Low heat of hydration cement.
- .6 Type HS and HSb - High sulphate-resistant cement.
- .2 Fly ash:
  - .1 Type F - with CaO content less than 8%.
  - .2 Type CI - with CaO content ranging from 8 to 20%.
  - .3 Type CH - with CaO greater than 20%.
- .3 GGBFS - Ground, granulated blast-furnace slag.
- .4 SF - Silica fume with high silicon dioxide (SiO<sub>2</sub>) content
- .5 N - Natural pozzolans

### **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-installation Meetings: in accordance with Section 01 31 00 – Project Management and Coordination, convene pre-installation meeting 2 weeks prior to beginning concrete works.
  - .1 Ensure key personnel, site supervisor, Departmental Representative attend.
    - .1 Verify project requirements.

### **1.6 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 At least 2 weeks prior to beginning Work, provide Departmental Representative with concrete mix designs for each class of concrete specified.
- .3 Provide testing results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.
- .4 Concrete records: provide accurate records of concrete items cast indicating date and location of placement, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.
- .5 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 60 minutes for concrete to be delivered to site of Work and discharged after batching.
- .6 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

### **1.7 QUALITY ASSURANCE**

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 At least 2 weeks prior to beginning Work, provide Departmental Representative with concrete mix designs for each class of concrete specified.
- .3 Provide testing results and reports for review by Departmental Representative and do not proceed without written approval when deviations from mix design or parameters are found.

- .4 Concrete records: provide accurate records of concrete items cast indicating date and location of placement, quality, air temperature and test samples taken as described in PART 3 - FIELD QUALITY CONTROL.
- .5 Concrete hauling time: provide for review by Departmental Representative deviations exceeding maximum allowable time of 90 minutes for concrete to be delivered to site of Work and discharged after batching.
- .6 Provide two copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- .1 Delivery and Acceptance Requirements:
  - .1 Concrete hauling time: deliver to site of Work and discharged within 120 minutes maximum after batching.
    - .1 Do not modify maximum time limit without receipt of prior written agreement from Departmental Representative and concrete producer as described in CSA A23.1/A23.2.
    - .2 Deviations to be submitted for review by Departmental Representative.
  - .2 Concrete delivery: ensure continuous concrete delivery from plant meets CSA A23.1/A23.2.

## **Part 2 PRODUCTS**

### **2.1 DESIGN CRITERIA**

- .1 Alternative 1 - Performance: to CSA A23.1/A23.2, and as described in MIXES of PART 2 - PRODUCTS.

### **2.2 PERFORMANCE CRITERIA**

- .1 Quality Control Plan: ensure concrete supplier meets performance criteria of concrete as established by Departmental Representative and provide verification of compliance as described in PART 1 - QUALITY ASSURANCE.

### **2.3 MATERIALS**

- .1 Portland Cement: to CSA A3001, Type HS.
- .2 Supplementary cementing materials: with maximum 20% Type F fly ash replacement, by mass of total cementitious materials to CSA A3001.
- .3 Water: to CSA A23.1.
- .4 Aggregates: to CSA A23.1/A23.2.
- .5 Admixtures:
  - .1 Air entraining admixture: to ASTM C 260.
  - .2 Chemical admixture: to ASTM C 494 and ASTM C 1017. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

- .3 Corrosion-inhibiting admixture: to ASTM C 494.
- .4 Lithium-based admixture: to ASTM C 494.
- .5 Shrinkage-reducing admixture (SRA): to ASTM C494 and ASTM WK 23938.
- .6 Shrinkage compensating grout (if required): premixed compound consisting of non-metallic aggregate, Portland cement, water reducing and plasticizing agents to CSA A23.1/A23.2.
  - .1 Compressive strength: 50 MPa at 28 days.
  - .2 Net shrinkage at 28 days: maximum 0%.
- .7 Non-premixed dry pack grout: composition of non-metallic aggregate Portland cement with sufficient water for mixture to retain its shape when made into ball by hand and capable of developing compressive strength of 50 MPa at 28 days.
- .8 Curing compound: to CSA A23.1/A23.2 and ASTM C 309, Type 1-chlorinated rubber.
- .9 Pre-moulded joint fillers:
  - .1 Bituminous impregnated fiber board: to ASTM D 1751.
  - .2 Sponge rubber: to ASTM D 1752, Type I, firm grade.
- .10 Polyethylene film: 0.152 mm thickness to CAN/CGSB-51.34.

## **2.4 MIXES**

- .1 Alternative 1 - Performance Method for specifying concrete: to meet Departmental Representative performance criteria to CSA A23.1/A23.2.
  - .1 Ensure concrete supplier meets performance criteria as established below and provide verification of compliance as in Quality Control Plan.
  - .2 Provide concrete mix to meet following hard state requirements:
    - .1 Durability and class of exposure: F-2.
    - .2 Compressive strength at 28 days age: 32 MPa minimum.
    - .3 Intended application: Foundation footings and walls.
    - .4 Aggregate size 20 mm maximum.
    - .5 Volume stability: acceptable volume change range 0.04% due to shrinkage, creep and freeze thaw cycle.
    - .6 Other special requirements: exposed aggregate finish for all concrete exposed to view.
    - .7 Air-entrainment: 5-8%
  - .3 Provide quality management plan to ensure verification of concrete quality to specified performance.
  - .4 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

## **Part 3 EXECUTION**

### **3.1 PREPARATION**

- .1 Obtain Departmental Representative's written approval before placing concrete.
  - .1 Provide 48 hours minimum notice prior to placing of concrete.
- .2 Place concrete reinforcing in accordance with Section 03 20 00 - Concrete Reinforcing.
- .3 During concreting operations:
  - .1 Development of cold joints not allowed.
  - .2 Ensure concrete delivery and handling facilitates placing with minimum of re-handling, and without damage to existing structure or Work.
- .4 Pumping of concrete is permitted only after approval of equipment and mix.
- .5 Ensure reinforcement and inserts are not disturbed during concrete placement.
- .6 Prior to placing of concrete obtain Departmental Representative's approval of proposed method for protection of concrete during placing and curing.
- .7 Protect previous Work from staining.
- .8 Clean and remove stains prior to application for concrete finishes.
- .9 Maintain accurate records of concrete placement items to indicate date, location of casting, quality, air temperature and test samples taken.
- .10 Do not place load upon new concrete until authorized by Departmental Representative.

### **3.2 INSTALLATION/ APPLICATION**

- .1 Do cast-in-place concrete work to CSA A23.1/A23.2.
- .2 Sleeves and inserts:
  - .1 Do not permit penetrations, sleeves, ducts, pipes or other openings to pass through beams, except where indicated or approved by Departmental Representative.
  - .2 Where approved by Departmental Representative, set sleeves, ties, and other inserts and openings as indicated or specified elsewhere.
  - .3 Sleeves and openings greater than 100 x 100 mm not indicated, must be reviewed by Departmental Representative.
  - .4 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain written approval of modifications from Departmental Representative before placing of concrete.
  - .5 Confirm locations and sizes of sleeves and openings shown on drawings.
- .3 Anchor bolts:
  - .1 Set anchor bolts to templates in co-ordination with appropriate trade prior to placing concrete.
  - .2 Grout anchor bolts in preformed holes or holes drilled after concrete has set only after receipt of written approval from Departmental Representative.
    - .1 Formed holes: 100 mm minimum diameter.
    - .2 Drilled holes: 25 mm minimum diameter larger than bolts used or to manufacturers' recommendations.
    - .3 Protect anchor bolt holes from water accumulations, snow and ice build-

ups.

- .4 Set bolts and fill holes with epoxy grout.
- .4 Grout under base plates using procedures in accordance with manufacturer's recommendations which result in 100% contact over grouted area.
- .5 Finishing and curing:
  - .1 Finish concrete to CSA A23.1/A23.2.
  - .2 Use procedures as reviewed by Departmental Representative or those noted in CSA A23.1/A23.2 to remove excess bleed water. Ensure surface is not damaged.
  - .3 Use curing compounds compatible with applied finish on concrete surfaces. Provide written declaration that compounds used are compatible.
  - .4 Rub exposed sharp edges of concrete with carborundum to produce 3 mm minimum radius edges unless otherwise indicated.
  - .5 Concrete floor slab to have a smooth finish.

### **3.3 FIELD QUALITY CONTROL**

- .1 Site tests: conduct tests as follows in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.
  - .1 Concrete placements.
  - .2 Slump.
  - .3 Air content.
  - .4 Compressive strength at 7 and 28 days.
  - .5 Air and concrete temperature.
- .2 Inspection and testing of concrete and concrete materials will be carried out by testing laboratory engaged and coordinated by Contractor for review to CSA A23.1/A23.2.
  - .1 Ensure testing laboratory is certified to CSA A283.
- .3 Ensure test results are distributed for discussion at pre-casting concrete meeting between testing laboratory and Departmental Representative.
- .4 Contractor will pay for costs of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.
- .5 Testing laboratory will take additional test cylinders during cold weather concreting. Cure cylinders on job site under same conditions as concrete which they represent.
- .6 Non-Destructive Methods for Testing Concrete: to CSA A23.1/A23.2.

### **3.4 CLEANING**

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  - .1 Divert unused concrete materials from landfill to local facility.
  - .2 Provide appropriate area on job site where concrete trucks can be safely washed.
  - .3 Divert unused admixtures and additive materials from landfill to official

hazardous material collections site.

- .4 Do not dispose of unused admixtures and additive materials into sewer systems, into lakes, streams, onto ground or in other location where it will pose health or environmental hazard.
- .5 Prevent admixtures and additive materials from entering drinking water supplies or streams.
- .6 Using appropriate safety precautions, collect liquid or solidify liquid with inert, non-combustible material and remove for disposal.
- .7 Dispose of waste in accordance with applicable local, Provincial/Territorial and National regulations.

**END OF SECTION**

**Part 1                      General**

**1.1                      RELATED REQUIREMENTS**

- .1      Section 03 30 00 Cast-in-Place Concrete

**1.2                      REFERENCES**

- .1      ASTM International
  - .1      ASTM A 307-14, Standard Specification for Carbon Steel Bolts, Studs and Threaded Rod, 60,000 PSI Tensile Strength.
- .2      CSA International
  - .1      CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2      CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
  - .3      CSA S16-14, Design of Steel Structures.
  - .4      CSA W48-14, Filler Metals and Allied Materials for Metal Arc Welding.
  - .5      CSA W59-13, Welded Steel Construction (Metal Arc Welding).

**1.3                      ACTION AND INFORMATIONAL SUBMITTALS**

- .1      Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2      Shop Drawings:
  - .1      Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.
  - .2      Indicate materials, core thicknesses, finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

**1.4                      QUALITY ASSURANCE**

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

**1.5                      DELIVERY, STORAGE AND HANDLING**

- .1      Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2      Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3      Storage and Handling Requirements:
  - .1      Store materials off ground in clean, dry, well-ventilated area.
  - .2      Replace defective or damaged materials with new.
- .3      Develop Construction Waste Management Plan related to Work of this Section.

- .4 Packaging Waste Management: remove for reuse pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Steel sections and plates: to CSA G40.20/G40.21, Grade 300W.
- .2 Welding materials: to CSA W59.
- .3 Welding electrodes: to CSA W48 Series.
- .4 Bolts and anchor bolts: to ASTM A307.
- .5 Grout: non-shrink, non-metallic, dry pack, 15 MPa at 24 hours.

### **2.2 FABRICATION**

- .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
- .2 Fit and shop assemble work, ready for erection.
- .3 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush.

### **2.3 FINISHES**

- .1 Galvanizing: hot dipped galvanizing with zinc coating 600 g/m<sup>2</sup> to CAN/CSA-G164.
- .2 Zinc primer: zinc rich, inorganic ready mix to MPI- EXT 5.2C in accordance with chemical component limits and restrictions requirements and VOC limits of CCD-047a.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for metal fabrications installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied.

### **3.2 ERECTION**

- .1 Do welding work in accordance with CSA W59 unless specified otherwise.
- .2 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .3 Provide suitable means of anchorage acceptable to Departmental Representative.

- .4 Exposed fastening devices to match finish and be compatible with material through which they pass.
- .5 Supply components for work by other trades in accordance with shop drawings and schedule.
- .6 Make field connections with bolts to CSA S16.
- .7 Deliver items over for casting into concrete and building into masonry together with setting templates to appropriate location and construction personnel.
- .8 Clean and touch-up galvanized surfaces with zinc rich primer where burned by field welding.
  - .1 Primer: maximum VOC limit 250 g/L to GS-11.

### **3.3 CLEANING**

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

### **3.4 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by metal fabrications installation.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1            Section 03 30 00 Cast-in-Place Concrete.

**1.2                REFERENCES**

- .1            ASTM International
  - .1            ASTM F1667 - 05 Standard Specification for Driven Fasteners Nails, Spikes, and Staples.
  - .2            ASTM A123/A123M-15 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
  - .3            A653/A653M-15 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2            CSA International
  - .1            CSA O86-14, Engineering Design in Wood
    - .1            CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
    - .2            CSA O121-08 (R2013), Douglas Fir Plywood.
    - .3            CSA O141-05 (R2014), Softwood Lumber.
    - .4            CSA O151-09 (R2014), Canadian Softwood Plywood.
    - .5            CAN/CSA-Z809-08 (R2013), Sustainable Forest Management.
- .3            National Lumber Grades Authority (NLGA)
  - .1            Standard Grading Rules for Canadian Lumber (2014).
- .4            Forest Stewardship Council (FSC)
  - .1            FSC-STD-01-001 V5-2 EN, FSC Principles and Criteria for Forest Stewardship.
- .5            Sustainable Forestry Initiative (SFI)
  - .1            SFI-(2015-2019) Standard.

**1.3                ACTION AND INFORMATIONAL SUBMITTALS**

- .1            Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2            Sustainable Design Submittals:
  - .1            Construction Waste Management:
    - .1            Submit project Waste Management Plan highlighting recycling and salvage requirements.
    - .2            Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 75% of construction wastes were recycled or salvaged.
- .3            Regional Materials: submit evidence that project incorporates required percentage 20% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
- .4            Wood Certification: submit vendor's or manufacturer's Chain-of-Custody Certificate

number for CAN/CSA-Z809 or FSC or SFI certified wood.

- .5 Low-Emitting Materials:
  - .1 Submit listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

#### **1.4 QUALITY ASSURANCE**

- .1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

#### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground in dry location 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, in kind.
  - .4 Develop Construction Waste Management Plan related to Work of this Section.
  - .5 Packaging Waste Management: remove for reuse (and return) by manufacturer of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **Part 2 Products**

#### **2.1 FRAMING STRUCTURAL AND PANEL MATERIALS**

- .1 Lumber: unless specified otherwise, softwood, rough sawn SPF grade #2 or better, moisture content 19% or less in accordance with following standards:
  - .1 CSA O141-05 (R2014) - Softwood Lumber.
  - .2 NLGA Standard Grading Rules for Canadian Lumber.
  - .3 CAN/CSA-Z809-08 (R2013) - Sustainable Forest Management or FSC or SFI certified.
- .2 Furring, blocking, nailing strips, and fascia backing:
  - .1 S2S is acceptable for non-visible work.
  - .2 Board sizes: SPF No. 2 or better grade.
  - .3 Dimension sizes: "standard" light framing or better grade.
  - .4 Post and timbers sizes: rough sawn No. 2 or better grade.

## **2.2 ACCESSORIES**

- .1 Nails, spikes and staples: to CSA B111.
- .2 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.
- .3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fibre plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.
- .4 Fastener Finishes:
  - .1 Galvanizing: to ASTM A 123/A 123M, use galvanized fasteners for all work.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions and good practice.
  - .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.

### **3.2 INSTALLATION**

- .1 Install members true to line, levels and elevations, square and plumb.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Install spanning members with "crown-edge" up.
- .4 Select exposed framing 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.
- .5 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
- .6 Countersink bolts where necessary to provide clearance for other work.

### **3.3 CLEANING**

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

### **3.4 PROTECTION**

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by rough carpentry installation.

**END OF SECTION**

## 1 GENERAL

### 1.02 REFERENCE STANDARDS

- .1 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-37.2-M88, Emulsified Asphalt, Mineral-Colloid Type, Unfilled, for Dampproofing and Waterproofing and for Roof Coatings.
  - .2 CAN/CGSB-37.3-M89, Application of Emulsified Asphalts for Dampproofing or Waterproofing.
  - .3 CAN/CGSB-37.5-M89, Cutback Asphalt Plastic Cement.
  - .4 CGSB 37-GP-6Ma-83, Asphalt, Cutback, Unfilled, for Dampproofing.
  - .5 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.
  - .6 CGSB 37-GP-11M-76(R1984), Application of Cutback Asphalt Plastic Cement.
  - .7 CGSB 37-GP-12Ma-84, Application of Unfilled Cutback Asphalt for Dampproofing.
  - .8 CGSB 37-GP-15M-76(R1984), Application of Asphalt Primer for Asphalt Roofing, Dampproofing and Waterproofing.
  - .9 CAN/CGSB-37.16-M89, Filled, Cutback, Asphalt for Dampproofing and Waterproofing.
  - .10 CAN/CGSB-37.28-M89, Reinforced Mineral Colloid Type, Emulsified Asphalt for Roof Coatings and for Waterproofing.
  - .11 CGSB 37-GP-36M-76, Application of Filled Cutback Asphalts for Dampproofing and Waterproofing.
  - .12 CGSB 37-GP-37M-77, Application of Hot Asphalt for Dampproofing or Waterproofing.
- .2 CSA International
  - .1 CAN/CSA-A123.4-04(R2008), Asphalt for Construction of Built-Up Roof Coverings and Waterproofing Systems.
- .3 Health Canada
  - .1 Workplace Hazardous Materials Information System (WHMIS)
    - .1 Material Safety Data Sheets (MSDS).

### 1.03 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 bituminous dampproofing application and include product characteristics, performance criteria, physical size, finish and limitations.

- .2 Submit a copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.
- .3 Manufacturer's Instructions: provide to indicate special handling criteria, installation sequence, and cleaning procedures.
- .4 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Reduction Workplan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.
  - .2 Recycled Content:
    - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.
    - .2 Submit evidence, when Supplementary Cementing Materials (SCMs) are used, to certify reduction in cement from Base Mix to Actual SCMs Mix, as percentage.
  - .3 Regional Materials: submit evidence that project incorporates required percentage 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.
  - .4 Low-Emitting Materials:
    - .1 Submit listing of coatings and sealers used in building, showing compliance with VOC and chemical component limits or restriction requirements.

#### **1.04 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements or with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect dampproofing materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Waste Reduction Workplan related to Work of this Section
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging

materials as specified in Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal

### **1.05 SITE CONDITIONS**

- .1 Ambient Conditions: temperature, relative humidity, moisture content.
  - .1 Apply dampproofing materials only when surfaces and ambient temperatures are within manufacturers' prescribed limits.
  - .2 Do not proceed with Work when wind chill effect would tend to set bitumen before proper curing takes place.
  - .3 Maintain air temperature and substrate temperature at dampproofing installation area above 5 degrees C for 24 hours before, during and 24 hours after installation.
  - .4 Do not apply dampproofing in wet weather.
- .2 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 PRODUCTS**

### **2.01 MATERIALS**

- .1 Asphalt:
  - .1 For application and curing at temperatures above 5 degrees C: to CAN/CGSB-37.2, CGSB 37-GP-6Ma, CAN/CGSB-37.16, CAN/CGSB-37.28, or CAN/CSA-A123.4.
    - .1 Package label or bill of lading for bulk hot liquid asphalt must indicate type, flash point, equiviscous temperature range and final blowing temperature.
  - .2 Sealing compound: plastic cutback asphalt cement to CAN/CGSB-37.5.
  - .3 Asphalt primer: to CGSB 37-GP-9Ma or CAN/CGSB-37.2.

## **3 EXECUTION**

### **3.01 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for bituminous dampproofing application installation in accordance with manufacturer's written instructions.
  - .1 Visually inspect substrate in presence of Departmental Representative
  - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### 3.02 WORKMANSHIP

- .1 Keep hot asphalt:
  - .1 Below its flash point.
  - .2 At or below its final blowing temperature.
  - .3 Within its equiviscous temperature range at place of application.

### 3.03 PREPARATION

- .1 Before applying dampproofing:
  - .1 Seal exterior joints between foundation walls and footings, joints between concrete floor slab and foundation and around penetrations through dampproofing with sealing compound.

### 3.04 APPLICATION

- .1 Do dampproofing in accordance with applicable application.
- .2 Do sealing work in accordance with CGSB 37-GP-11M.
- .3 Do priming of surface in accordance with CGSB 37-GP-15M.
- .4 Apply primer to CGSB primer standard.
- .5 Apply dampproofing in accordance with applicable CGSB application standard.

Material		Application
CAN/CGSB-37.2	use	CAN/CGSB-37.3
CGSB 37-GP-6Ma	use	CGSB 37-GP-12M
CAN/CGSB-37.16	use	CGSB 37-GP-36M
CAN/CGSB-37.28	use	CAN/CGSB-37.3
CSA A123.4	use	CGSB 37-GP-37M

### 3.05 SCHEDULE

- .1 Apply continuous, uniform coating to entire exterior faces of foundation walls from 50 mm below finished grade level to and including tops of foundation wall footings.
- .2 Apply continuous, uniform coating to exterior side of foundation walls enclosing rooms below finished grade. Include exterior portion of interior walls where floors in adjacent rooms are at different elevations.
- .3 Apply two additional coats of dampproofing to vertical corners and construction joints for a minimum width of 230 mm on each side, and all around and for 230 mm along pipes passing through walls.

### 3.06 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and

recycling in accordance with Section 01 74 21 -  
Construction/Demolition Waste Management and Disposal.

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

### **3.07 PROTECTION**

.1 Protect installed products and components from damage  
during construction.

.2 Repair damage to adjacent materials caused by dampproofing  
application.

**END OF SECTION**

## 1 GENERAL

### 1.1 REFERENCE STANDARDS

- .1 ASTM International
  - .4 ASTM D41/D41M-11, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.
  - .5 ASTM D449-03(2008), Standard Specification for Asphalt Used in Dampproofing and Waterproofing.
  - .6 ASTM D2178-04, Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- .2 Canadian General Standards Board (CGSB)
  - .1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing.
  - .2 CAN/CGSB-37.29-M89, Rubber-Asphalt Sealing Compound.
  - .3 CAN/CGSB-37.50-M89, Hot Applied, Rubberized Asphalt for Roofing and Waterproofing.
  - .4 CAN/CGSB-37.51-M90 Application for Hot-Applied Rubberized Asphalt, for Roofing and Waterproofing.
  - .5 CAN/CGSB-51.34-M86(R1988), Vapour Barrier, Polyethylene Sheet for Use in Building Construction.
- .3 CSA International
  - .1 CSA A231.1/A231.2-06(R2010), Precast Concrete Paving Slabs/ Precast Concrete Pavers.
  - .2 CSA O121-2008, Douglas Fir Plywood.
  - .3 CSA O151-09, Canadian Softwood Plywood.
- .4 Department of Justice Canada (Jus)
  - .1 Canadian Environmental Protection Act (CEPA), 1999 (R2008)
  - .2 Transportation of Dangerous Goods Act (TDGA), 1992.
- .5 National Research Council Canada (NRC)/Institute for Research in Construction (IRC) - Canadian Construction Materials Centre (CCMC)
  - .1 CCMC-2002, Registry of Product Evaluations.
- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .2 CAN/ULC-S704-2011, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

### 1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof of manufacturer's CCMC Listing and listing number to Departmental Representative.
- .3 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for applied rubberized asphalt

waterproofing and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit a copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

.4 Sustainable Design Submittals:

.2 Construction Waste Management:

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

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

.3 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

.5 Low-Emitting Materials:

.1 Submit listing of adhesives and sealants and paints and coatings used in building, comply with VOC and chemical component limits or restriction requirements.

### **1.3 DELIVERY, STORAGE AND HANDLING**

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

.2 Stand roll materials on end.

.3 Remove only in quantities required for same day use.

.4 Store insulation protected from sunlight and weather and deleterious materials.

.5 Store materials in accordance with manufacturer's written instructions to prevent damage or loss of performance.

.6 Store and protect rubberized asphalt waterproofing materials from nicks, scratches, and blemishes.

.7 Replace defective or damaged materials with new.

.8 Develop Waste Reduction Workplan related to Work of this Section

.9 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

### **1.4 PROJECT/SITE ENVIRONMENTAL REQUIREMENTS**

.1 Ambient Conditions.

.2 Temperature, relative humidity, moisture content.

.1 Apply membranes only when surfaces and ambient

temperatures are within manufacturers' prescribed limits.

.2 Do not install membrane when air and substrate temperature remains below 10 degrees C, or when wind chill gives equivalent cooling effect.

.3 Install membrane on dry substrate, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into system.

.3 Safety: comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of rubberized asphalt, sealing compounds, primers and caulking materials.

## **1.5 WARRANTY**

.1 For the Work of this Section 07 14 13 - Hot Fluid-Applied Rubberized Asphalt Waterproofing the 12 months warranty period is extended to 60 months.

## **2 PRODUCTS**

### **2.01 PERFORMANCE REQUIREMENTS**

.1 Waterproofing System: capable of resisting moisture/water head of 25mm, and preventing moisture migration to interior.

### **2.02 COMPATIBILITY**

.1 Compatibility between components of system and adjacent materials is essential. Provide written declaration to Departmental Representative stating that materials and components, as assembled in system, meet this requirement.

### **2.03 PRIMERS**

.1 Asphalt primer: to CGSB 37-GP-9Ma, VOC content to comply with manufacturer requirements.

### **2.04 RUBBERIZED ASPHALT**

.1 Hot applied rubberized asphalt: to CAN/CGSB-37.50, VOC content to comply with manufacturer requirements

### **2.05 SEPARATION SHEET**

.1 Asphalt impregnated glass felt: to ASTM D2178, Type IV.  
.2 Polyethylene film: to CAN/CGSB-51.34, Type 1, 0.125 mm thick.

## **3 EXECUTION**

### **3.01 SUBSTRATE 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.

.2 Prior to start of Work make sure:

.1 Substrates are firm, straight, smooth, dry, free of snow, ice or frost, contamination and swept clean of dust and debris.

.2 Drains have been installed at proper elevations relative to finished surfaces.

.3 Sleeves, vents, pipes and other items passing through substrates receiving work of this Section are properly and rigidly installed.

### **3.02 PREPARATION - PROTECTION**

.1 Cover walls, walks 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 away from face of building until drains or hoppers installed and connected.

.5 Protect 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 Free substrates from curing compounds, dust and loose particles, grease, paint, frost, form oil and other material detrimental to bond of membrane materials.

.8 Reinforce substrate cracks less than 3 mm wide with layer of hot rubberized asphalt 300 mm wide centred on crack and 150 mm wide fabric reinforcing sheet embedded into it.

### **3.03 PREPARATION OF CONCRETE**

.1 If required, apply primer to dry substrate in accordance with CAN/CGSB-37.51.

### **3.4 FIELD QUALITY CONTROL**

.1 Inspection and testing of membrane application will be carried out by testing laboratory designated by Departmental Representative.

.3 Costs of tests will be paid by contractor.

### **3.5 PROTECTION OF COMPLETED WORK**

.1 Ensure membrane is undamaged before application of protection board.

.2 Apply protection board to cover membrane at locations as indicated

### **3.6 CLEANING**

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

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

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

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

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

**END OF SECTION**

## 1 GENERAL

### 1.02 REFERENCE STANDARDS

- .1 ASTM International
  - .1 ASTM C208-12, Standard Specification for Cellulosic Fiber Insulating Board.
  - .2 ASTM C591-13, Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation.
  - .3 ASTM C612-14, Standard Specification for Mineral Fibre Block and Board Thermal Insulation.
  - .4 ASTM C726-12, Standard Specification for Mineral Fiber Roof Insulation Board.
  - .5 ASTM C728-13, Standard Specification for Perlite Thermal Insulation Board.
  - .6 ASTM C1126-14, Standard Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation.
  - .7 ASTM C1289-14, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
  - .8 ASTM E96/E96M-13, Standard Test Methods for Water Vapour Transmission of Materials.
- .3 Canadian General Standards Board (CGSB)
  - .1 CGSB 71-GP-24M-AMEND-77(R1983), Adhesive, Flexible, for Bonding Cellular polystyrene Insulation.
- .4 CSA Group
  - .1 CSA B149 PACKAGE-10, Consists of B149.1, Natural Gas and Propane Installation Code and B149.2, Propane Storage and Handling Code.
- .5 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  - .1 Material Safety Data Sheets (MSDS).
- .6 Underwriters Laboratories of Canada (ULC)
  - .1 CAN/ULC-S604-2012, Standard for Factory-Built Type A Chimneys.
  - .2 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Coverings.
  - .3 CAN/ULC-S702-2012, Standard for Mineral Fibre Insulation for Buildings.
  - .4 CAN/ULC-S704-11, Standard for Thermal Insulation Polyurethane and Polyisocyanurate, Boards, Faced.

### 1.03 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 board insulation and include product characteristics, performance criteria, physical

size, finish and limitations.

.2 Submit a copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures. Indicate VOC's during application and curing.

.3 Certificates:

.1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.4 Test Reports:

.1 Submit certified test reports showing compliance with specified performance characteristics and physical properties.

.5 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.8 Sustainable Design Submittals:

.1 Construction Waste Management:

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

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

.2 Recycled Content:

.1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

#### **1.04 DELIVERY, STORAGE AND HANDLING**

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

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

.3 Storage and Handling Requirements:

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

.2 Store and protect specified materials from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Develop Waste Reduction Workplan related to Work of this Section

.5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition

Waste Management and Disposal

**2 PRODUCTS**

**2.01 INSULATION**

.1 Extruded polystyrene (XPS): to CAN/ULC-S701, thickness: as indicated

**3 EXECUTION**

**3.01 EXAMINATION**

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for board insulation application in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative. Ensure clear crushed stone is level prior to installation to ensure even distribution of weight.

.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.

**3.02 INSTALLATION**

.1 Install insulation to maintain continuity of thermal protection to building elements and spaces.

.2 Fit insulation tight around plumbing and heating pipes and ducts, around footings and other protrusions.

.5 Cut and trim insulation neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only insulation boards free from chipped or broken edges. Use largest possible dimensions to reduce number of joints.

.6 Offset both vertical and horizontal joints in multiple layer applications.

.7 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

**3.03 CLEANING**

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

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

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

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

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

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCE STANDARDS**

- .1        ASTM International
  - .2        ASTM C665-12, Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.
  - .3        ASTM C1320-10, Standard Practice for Installation of Mineral Fiber Batt and Blanket Thermal Insulation for Light Frame Construction.
- .3        CSA Group
  - .1        CSA B111-1974(R2003), Wire Nails, Spikes and Staples.
  - .2        CSA B149 PACKAGE-10, Consists of B149.1, Natural Gas and Propane Installation Code and B149.2, Propane Storage and Handling Code.
- .4        Underwriters Laboratories of Canada (ULC)
  - .1        CAN/ULC-S604-2012, Standard for Factory-Built Type A Chimneys.
  - .2        CAN/ULC-S702-2012, Standard for Mineral Fibre Insulation for Buildings.

**1.03 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 blanket insulation and include product characteristics, performance criteria, physical size, finish and limitations.
- .3        Certificates:
  - .1        Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4        Test Reports:
  - .1        Submit certified test reports showing compliance with specified performance characteristics and physical properties.
- .5        Sustainable Design Submittals:
  - .1        Construction Waste Management:
    - .1        Submit project Waste Reduction Workplan highlighting recycling and salvage requirements.
    - .2        Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.

**1.04               DELIVERY, STORAGE AND HANDLING**

- .1        Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2        Delivery and Acceptance Requirements: deliver materials to site in original factory

packaging, labelled with manufacturer's name and address.

- .3 Storage and Handling Requirements:
  - .1 Store materials in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect specified materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.
- .4 Develop Construction Waste Reduction Workplan related to Work of this Section
- .5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **Part 2 PRODUCTS**

### **2.1 INSULATION**

- .1 Batt and blanket mineral fibre: to CAN/ULC-S702.
  - .1 Type: 1
  - .2 Thickness: as indicated.

## **Part 3 EXECUTION**

### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for blanket insulation application in accordance with manufacturer's written instructions
- .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 INSULATION INSTALLATION**

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces and to ASTM C1320.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN/ULC-S604 Type A chimneys and CSA B149.1 and CSA B149.2 Type B and L vents.
- .5 Do not enclose insulation until it has been inspected and approved by Departmental Representative.

### **3.3 CLEANING**

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

**END OF SECTION**

## **1 GENERAL**

### **1.1 REFERENCE STANDARDS**

- .1 Canadian General Standards Board (CGSB)
- .2 CAN/CGSB-51.34-M86, Vapour Barrier, Polyethylene Sheet, for Use in Building Construction.

### **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 vapour retarders and include product characteristics, performance criteria, physical size, finish and limitations.
  - .2 Submit a copy of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.
- .3 Certificates:
  - .1 Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .4 Sustainable Design Submittals:
  - .1 Construction Waste Management:
    - .1 Submit project Waste Reduction Workplan highlighting recycling and salvage requirements.
    - .2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.
  - .2 Recycled Content:
    - .1 Submit listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

### **1.3 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials off ground and in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect specified materials from nicks,

scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Develop Waste Reduction Workplan related to Work of this Section.

.5 Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding, and packaging materials as specified in Waste Reduction Workplan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **2 PRODUCTS**

### **2.01 SHEET VAPOUR BARRIER**

.1 Polyethylene film: to CAN/CGSB-51.34, 4MIL thick for walls.

.1 Polyethylene film: to CAN/CGSB-51.34, 6MIL thick under slab.

### **2.02 ACCESSORIES**

.1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.

.2 Staples: minimum 6 mm leg.

.3 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

## **3 EXECUTION**

### **3.01 EXAMINATION**

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for vapour retarder installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of Departmental Representative

.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

### **3.02 INSTALLATION**

.1 Ensure services are installed and inspected prior to installation of retarder.

.2 Install sheet vapour retarder on warm side of exterior wall and floor assemblies prior to installation of gypsum board to form continuous retarder.

.3 Use sheets of largest practical size to minimize joints.

.4 Inspect for continuity. Repair punctures and tears with sealing tape before work is concealed.

### **3.03 EXTERIOR SURFACE OPENINGS**

.1 Cut sheet vapour retarder to form openings and ensure material is lapped and sealed to frame.

### **3.04 PERIMETER SEALS**

- .1 Seal perimeter of sheet vapour barrier as follows:
  - .1 Apply continuous bead of sealant to substrate at perimeter of sheets.
  - .2 Lap sheet over sealant and press into sealant bead.
  - .3 Install staples through lapped sheets at sealant bead into wood substrate.
  - .4 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

### **3.05 LAP JOINT SEALS**

- .1 Seal lap joints of sheet vapour barrier as follows:
  - .1 Attach first sheet to substrate.
  - .2 Apply continuous bead of sealant over solid backing at joint.
  - .3 Lap adjoining sheet minimum 150 mm and press into sealant bead.
  - .4 Install staples through lapped sheets at sealant bead into wood substrate.
  - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

### **3.06 ELECTRICAL BOXES**

- .1 Seal electrical switch and outlet device boxes that penetrate vapour barrier as follows:
  - .1 Install moulded box vapour barrier or wrap boxes with film sheet providing minimum 300 mm perimeter lap flange.
  - .2 Apply sealant to seal edges of flange to main vapour barrier and seal wiring penetrations through box cover.

### **3.07 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
  - .1 Remove insulation material spilled during installation and leave work area ready for application of wall board.
  - .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
    - .1 Remove recycling containers and bins from site and

dispose of materials at appropriate facility.

**END OF SECTION**

**Part 1            General**

**1.1                REFERENCES**

- .1    ASTM International
  - .1    ASTM D 698-07e1, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft<sup>2</sup>) (600kN-m/m<sup>2</sup>).
- .2    CSA International
  - .1    CSA A23.1/A23.2-09, Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .3    U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1    EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**Part 2            Products**

**2.1                MATERIALS**

- .1    Refer to the Riding Mountain National Park – Geotechnical Recommendations for the Rehabilitation of Four Buildings (Appendix D)
- .2    Sand Backfill is defined as per ASTM aggregate and soil terminology as material passing a 4.75-mm sieve (No. 4) and retained on a 0.075-mm (No. 200) sieve.

**Part 3            Execution**

**3.1                EXAMINATION**

- .1    Verification of Conditions:
  - .1    Examine geotechnical report provided as Appendix D.
  - .2    Before commencing work establish locations of buried services on and adjacent to site.
  - .3    Identify areas for soil salvage with Departmental Representative.
- .2    Evaluation and Assessment:
  - .1    Arrange with appropriate authority for relocation of buried services that interfere with execution of work. Pay costs of relocating services.
  - .2    Testing of materials and compaction of backfill will be carried out by testing laboratory.
  - .3    Not later than 1 week before backfilling or filling, provide to designated testing agency, 23 kg sample of backfill materials proposed for use.
  - .4    Not later than 48 hours before backfilling or filling with approved material, notify Departmental Representative so that compaction tests can be carried out by designated testing agency.
  - .5    Before commencing work, conduct with Departmental Representative condition survey of existing structures, trees and plants, lawns, fencing, service poles, wires, rail tracks and paving, survey bench marks and monuments which may be

affected by work.

### **3.2 PREPARATION**

- .1 Temporary Erosion and Sedimentation Control:
  - .1 Use temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent land and roads, in accordance with requirements of authorities having jurisdiction, specific to site, to EPA 832/R-92-005 and requirements of authorities having jurisdiction.
  - .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- .2 Protection of in-place conditions:
  - .1 Protect excavations from freezing.
  - .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's approval.
  - .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
  - .5 Protect buried services that are to remain undisturbed.
- .3 Removal:
  - .1 Remove obsolete buried services within 2 m of foundations. Cap cut-offs.
  - .2 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
  - .3 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders and debris within area affected by Work.
  - .4 Remove stumps and tree roots below footings, slabs, and paving, and to 600 mm below finished grade elsewhere.

### **3.3 EXCAVATION**

- .1 Shore and brace excavations if and as required to protect slopes and banks and perform work in accordance with Provincial and Municipal regulations.
- .2 All excavation is to be carried-out with hand-tools OR with Departmental Representative approval of Careful Shallow-Depth Machine Excavation. Careful Shallow-Depth Machine Excavation procedure listed in .5 below.
  - .1 When an item determined to be of potentially cultural significance is found, contact Departmental Representative immediately. Excavation in the immediate area to be paused until approval to proceed by Departmental Representative.
  - .3 Excavation to continue in a different area of work.

- .3 Topsoil stripping:
  - .1 Do not handle topsoil while in wet or frozen condition or in any manner in which soil structure is adversely affected.
  - .2 Begin topsoil stripping of areas as directed by Departmental Representative after area has been cleared of vegetation.
  - .3 Strip topsoil to depths as indicated by Departmental Representative. Avoid mixing topsoil with subsoil.
  - .4 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
  - .5 Stockpile in locations as directed by Departmental Representative.
    - .1 Topsoil stockpiles should be located where they will not be easily disturbed, erode, block drainage structures, or interfere with work on site.
    - .2 Topsoil that has been salvaged should be replaced only in close proximity to the location it was removed.
    - .3 Stockpile height not to exceed 1.5 m.
    - .4 Protect stockpiles from contamination, compaction, rain and wind erosion with burlap matting as approved by Departmental Representative.
  - .6 Replace topsoil as soon as possible, to prevent leaching of nutrients and loss of micro-organisms.
  - .7 Disposal of unused topsoil is to be in an environmentally responsible manner as directed by Departmental Representative.
- .4 Excavate as required to carry out work, in all materials met.
  - .1 Do not disturb soil or rock below excavated surfaces. Notify Departmental Representative when excavations are complete.
- .5 Careful Shallow-Depth Machine Excavation:
  - .1 Machine excavation to occur only where there is no suspected stone that will be salvaged and re-used in the construction of the foundation system.
  - .2 Smooth edged bucket of mini-excavator not to exceed 610mm wide.

### **3.4 SITE QUALITY CONTROL**

- .1 Fill material and spaces to be filled to be inspected and approved by Departmental Representative.
- .2 Approval of Careful Shallow-Depth Machine Excavation will be based on successful demonstration of mini-excavator operation:
  - .1 Contractor to arrange for demonstration of Careful Shallow-Depth Machine Excavation on scheduled day approved by Departmental Representative.
  - .2 Demonstration to be video-taped and executed before Departmental Representative.
  - .3 Mini-excavator operator full-name, qualifications, safety and health certificates, and employee number to be submitted to Departmental Representative.

**3.5 BACKFILLING**

- .1 Start backfilling only after inspection and receipt of written approval of fill material and spaces to be filled from Departmental Representative.
- .2 Remove snow, ice, construction debris, organic soil and standing water from spaces to be filled.
- .3 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.
- .4 Under seeded and sodded areas: use site excavated material to bottom of topsoil or clay layer as required.
- .5 Against foundations: excavated material or imported material with no stones larger than 200 mm diameter within 600 mm of structures.

**3.6 GRADING**

- .1 Grade to ensure that water will drain away from buildings, walls, ramps and road areas, to areas approved by Departmental Representative. Grade to be gradual between finished spot elevations as indicated.

**3.7 CLEANING**

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  - .1 Dispose of cleared and grubbed material off site daily.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

**END OF SECTION**

## **Part 1 General**

### **1.1 RELATED REQUIREMENTS**

- .1 Section 01 11 00 – Summary of Work.

### **1.2 MEASUREMENT AND PAYMENT**

- .1 Measure geotextiles in square metres of surface covered by material. No allowance will be made for seams and overlaps.

### **1.3 REFERENCES**

- .1 ASTM International
  - .1 ASTM D 4491-99a(2009), Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
  - .2 ASTM D 4595-09, Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
  - .3 ASTM D 4751-04, Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- .2 Canadian General Standards Board (CGSB)
  - .1 CAN/CGSB-148.1, Methods of Testing Geotextiles and Complete Geomembranes.
    - .1 No.2-M85, Methods of Testing Geosynthetics - Mass per Unit Area.
    - .2 No.3-M85, Methods of Testing Geosynthetics - Thickness of Geotextiles.

### **1.4 ACTION AND INFORMATIONAL SUBMITTALS**

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
  - .1 Submit manufacturer's instructions, printed product literature and data sheets for geotextiles and include product characteristics, performance criteria, physical size, finish and limitations.

### **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Storage and Handling Requirements:
  - .1 Store materials in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect geotextiles from direct sunlight and UV rays.
  - .3 Replace defective or damaged materials with new.

## **Part 2 PRODUCTS**

### **2.1 MATERIAL**

- .1 Geotextile: non-woven synthetic fibre fabric, supplied in rolls.
- .2 Physical properties:
  - .1 Thickness: to CAN/CGSB-148.1, No.3, minimum 2.7 mm.
  - .2 Mass per unit area: to CAN/CGSB-148.1, No.2, minimum 339 g/m<sup>2</sup>.
  - .3 Tensile strength and elongation (in any principal direction): to ASTM D 4595.

- .1 Tensile strength: minimum 1202 N, wet condition.
- .2 Elongation at break: minimum 50%.
  
- .3 Hydraulic properties:
  - .1 Apparent opening size (AOS): to ASTM D 4751, 0.150 mm.
  - .2 Water Flow Rate to ASTM D 4491, minimum 3463 l/min/m<sup>2</sup>

### **Part 3 EXECUTION**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for geotextile material installation in accordance with manufacturer's written instructions.
  - .1 Inform Project Authority of unacceptable conditions immediately upon discovery.
  - .2 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Project Authority.

#### **3.2 INSTALLATION**

- .1 Place geotextile material by unrolling onto graded surface in orientation, manner and locations indicated.
- .2 Place geotextile material smooth and free of tension stress, folds, wrinkles and creases.
- .3 Overlap each successive strip of geotextile 600 mm over previously laid strip.
- .4 Protect installed geotextile material from displacement, damage or deterioration before, during and after placement of material layers.
- .5 After installation, cover with overlying layer within 4 hours of placement.
- .6 Replace damaged or deteriorated geotextile to approval of Project Authority.

#### **3.3 PROTECTION**

- .1 Vehicular traffic not permitted directly on geotextile.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1      Environmental Procedures                      Section 01 35 43
- .2      Earthwork for Minor Works                    Section 31 00 99
- .3      Hand Seeding                                      Section 32 92 19.19

**1.2                REFERENCES**

- .1      The Canadian System of Soil Classification, Third Edition, 1998.
- .2      Canadian Council of Ministers of the Environment
  - .1      PN1340-2005, Guidelines for Compost Quality.
- .3      U.S. Environmental Protection Agency (EPA)/Office of Water
  - .1      EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

**1.3                MEASUREMENT PROCEDURES**

- .1      Preparation of sub-grade for placing topsoil will not be measured for payment.
- .2      Measure supplying, placing and spreading topsoil in cubic metres as determined from actual surface area covered and depth of topsoil specified.
  - .1      Specified depth of topsoil: measured and approved by Departmental Representative.
- .3      Measure finish grading in square metres from actual surface measurements as determined by Departmental Representative.

**1.4                SUBMITTALS**

- .1      Conform to requirements of Section 01 33 00 – Submittal Procedures. Submit the following, for Departmental Representative approval:
  - .1      Imported Topsoil: provide samples from each source intended for use. Samples shall weigh approximately 500 g and be packaged in clean containers. Provide the following information with topsoil sample: location of topsoil source, previous land use, and date of sampling. Sample shall be typical of the topsoil lot to be supplied and provide an accurate indication of colour, texture and organic content.
  - .2      Original copy of each soil analysis report for approval before delivering any topsoil to site.
  - .3      Copies of all permits and licenses as applicable to work of this contract.

**1.5 SOIL ANALYSIS**

- .1 Contractor shall be responsible for ensuring all samples of imported soil are submitted for testing well in advance of commencement of work. Imported topsoil shall not be delivered to site until approved by Departmental Representative.
- .2 Native Stockpiled Topsoil: Contractor will arrange and pay for services of accredited testing laboratory to perform horticultural soil analysis on stockpiled native topsoil, where applicable.
- .3 Soil analysis for horticultural use shall include results for: existing major soil nutrients; soil pH value; total soluble salts (electrical conductivity); percentage of organic matter; soil texture and percentage of sand, silt and clay; nutrient recommendations; and recommendations for soil amendments.
- .4 Departmental Representative reserves the right to inspect and evaluate all sources of soil selected by Contractor.
- .5 Submit original copy of soil analysis report the Departmental Representative as required.

**1.6 SOURCE OF TOPSOIL SUPPLY**

- .1 Use native topsoil previously stripped and stockpiled under this Contract, provided it meets specified requirements. Contractor shall be responsible for estimating quantity of stockpiled topsoil available on site.
- .2 If native topsoil is inadequate in quantity, quality, or both, use imported topsoil meeting specified requirements for balance of topsoil required.

**1.7 PAYMENT**

- .1 Testing of topsoil: Contractor will pay for cost of tests as specified in Section 01 29 83 - Payment Procedures for Testing Laboratory Services.

**1.8 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Landscape Contractor: to be a Member in Good Standing of the Manitoba Nursery Landscape Association.

**1.9 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .2 Divert unused soil amendments from landfill to official hazardous material collections site approved by Departmental Representative.
- .3 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground or in locations where it will pose health or environmental hazard.

**Part 2 Products**

**2.1 TOPSOIL**

.1 Topsoil: fertile natural loam, capable of sustaining healthy growth. Topsoil containing invasive seeds, construction debris, or sod clumps is not acceptable. Topsoil to be loose and friable, free of subsoil, clay lumps, stones in excess of 20 mm, live plants, roots or any other deleterious material greater than 20 mm diameter, free of litter, foreign matter and toxic materials harmful to plant growth. Topsoil must be approved by Departmental Representative prior to delivery and to meet the following requirements:

- .1 Minimum 6% organic matter.
- .2 Acidity/alkalinity shall range from 5.9 pH to 7.0 pH.
- .3 Electrical Conductivity (E.C.) - level of soluble salts shall not exceed 1.5 dS/m.
- .4 Texture: “Loam Topsoil” in accordance with Canadian System of Soil Classification. Topsoil to fall within an allowance of +/-2% of the values stated in the table below:

Soil	Sand (%)	Silt (%)	Clay (%)	Class
Topsoil	35	35	30	Loam

- .2 Peat Moss: decomposed plants, fairly elastic and homogeneous, free of decomposed colloidal residue, wood, sulphur and iron. Minimum of 80% organic matter by mass, pH value between 4.5 and 6.0. Furnished in an air-dry state, packed in standard bags or bales showing name of manufacturer.
- .3 Sand: washed coarse sand, medium to coarse textured, free of impurities, chemical or organic matter.
- .4 Lime: dry ground agricultural limestone containing minimum 85% of total carbonates meeting gradation requirements: percentage passing by weight – 90% passing 1.0 mm sieve, 50% passing 0.125 mm sieve.
- .5 Sulphur: finely crushed agricultural elemental sulphur, free of impurities.

**2.2 SOIL AMENDMENTS**

- .1 Apply and evenly spread soil amendments at specified rate as recommended in soil analysis report with Departmental Representative approval.
- .2 Mix soil amendment well into full depth of topsoil. Retest amended topsoil to confirm compliance with soil analysis report.

**2.3 SOURCE QUALITY CONTROL**

- .1 Advise Departmental Representative of sources of topsoil to be utilized with sufficient lead time for testing.
- .2 Contractor is responsible for amendments to supply topsoil as specified.
- .3 Soil testing by recognized testing facility for PH, P and K, and organic matter.
- .4 Testing of topsoil will be carried out by testing laboratory designated by Departmental Representative.

- .1 Soil sampling, testing and analysis to be in accordance with Provincial standards.

### **Part 3 Execution**

#### **3.1 PREPARATION OF EXISTING GRADE**

- .1 Verify that grades are as per drawings.
  - .1 If discrepancies occur, notify Departmental Representative.
- .2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.
- .3 Remove debris, roots, branches, stones in excess of 25 mm diameter and other deleterious materials.
  - .1 Remove soil contaminated with calcium chloride, toxic materials and petroleum products.
  - .2 Remove debris which protrudes above surface.
  - .3 Dispose of removed material off site.

#### **3.2 PREPARATION OF NATIVE STOCKPILED TOPSOIL**

- .1 Control and eliminate all perennial grass and weeds including their root systems until native stockpiled topsoil is required for use. Stockpiled topsoil shall be reasonably free of all perennial grass and weed growth before being placed and spread on site.
- .2 Perform weed control, as necessary, in accordance with relevant government chemical pesticide application legislation. Obtain Departmental Representative approval for all pesticide applications prior to use.
- .3 Submit detailed pesticide applicator's log for verification after each application of approved pesticide.
- .4 Screen stockpiled topsoil as directed by Departmental Representative prior to re-spreading on site. Provide a screener capable of removing stones, soil lumps, foreign debris, undesirable plants and roots from soil to meet requirements of specifications.

#### **3.3 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL**

- .1 Fine grade and loosen topsoil. Eliminate rough spots and low areas to ensure positive drainage away from structures. Prepare a loose friable bed by means of cultivation and subsequent raking. Maintain levels, profiles and contours of subgrade.
- .2 Spread topsoil as indicated to following minimum depths after settlement.
  - .1 150 mm for seeded areas.
- .3 Manually spread topsoil to prevent damage.

#### **3.4 SOIL AMENDMENTS**

- .1 Apply and evenly spread soil amendments at specified rate as recommended in soil

analysis report with approval from Departmental Representative.

- .2 Mix soil amendment well into full depth of topsoil. Retest amended topsoil to confirm compliance with soil analysis report.

### **3.5 FINISH GRADING**

- .1 Grade to eliminate rough spots and low areas and ensure positive drainage.
  - .1 Prepare loose friable bed by means of cultivation and subsequent raking.
- .2 Consolidate topsoil to required bulk density using equipment approved by Departmental Representative.
  - .1 Leave surfaces smooth, uniform and firm against deep footprinting.

### **3.6 ACCEPTANCE**

- .1 Departmental Representative will inspect and verify topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

### **3.7 SURPLUS MATERIAL**

- .1 Dispose of materials except topsoil not required where directed by Departmental Representative.

### **3.8 CLEANING**

- .1 Proceed in accordance with Section 01 74 11 - Cleaning.
- .2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**END OF SECTION**

**Part 1            General**

**1.1                RELATED REQUIREMENTS**

- .1    Environmental Procedures                    Section 01 35 43
- .2    Earthwork for Minor Works                Section 31 00 99

**1.2                REFERENCES**

- .1    Parks Canada National Best Management Practices, Common Activities, March 2017.

**1.3                MEASUREMENT AND PAYMENT**

- .1    Payment for seeding will be made at unit price bid per square metre of actual surface measurements verified by the Departmental Representative. Areas of blending into existing grass will not be measured for payment.
- .2    Area indicated in Unit Price Table is for work associated with minor grading and excavation work only. All other seeding resulting from rehabilitation and restoration of other areas of the site due to the Contractor’s machinery and use of the site is considered an incidental cost and shall be included in the lump sum amount of the cost of the work to execute the Contract.

**1.4                ADMINISTRATIVE REQUIREMENTS**

- .1    Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 31 19 - Project Meetings.
- .2    Scheduling:
  - .1        Schedule seeding to coincide with preparation of soil surface.
  - .2        Pre-Installation Meetings: conduct pre-installation meeting to verify project requirements, installation instructions and warranty requirements in accordance with Section 01 31 19 - Project Meetings.

**1.5                ACTION AND INFORMATIONAL SUBMITTALS**

- .1    Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2    Product Data:
  - .1        Submit manufacturer's instructions, printed product literature and data sheets for seed, and fertilizer (if required).
  - .2        Submit two 2 copies of WHMIS MSDS in accordance with Section 01 35 29.06 - Health and Safety Requirements, 01 35 43 - Environmental Procedures.
- .3    Certificates: certificate of seed analysis to be provided to the Departmental Representative. Certificates of Analysis must: include both the common and scientific name following the CANADENSYS nomenclature system; indicate if the seed is a cultivar, ecovar, or wild native; geographic origin (seed source); date of collection; method of seed storage; germination, viability and vigour; and indicate all other species occurring including agronomic, weed, and native species; and date of the analysis. The contact information for the Seed Supplier will be included.

- .4 Test Reports: submit certified test reports showing compliance with specified performance characteristics and physical properties.

## **1.6 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Landscape Contractor: to be a Member in Good Standing of the Alberta Horticultural Trades Association

## **1.7 DELIVERY, STORAGE AND HANDLING**

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

## **1.8 WARRANTY**

- .1 For seeding, 12 month warranty period is extended to one (1) full growing season.

## **Part 2 Products**

### **2.1 SEED MIX**

- .1 Seed mix to be supplied by Parks Canada.

### **2.2 WATER**

- .1 Free of impurities that would inhibit germination and growth.
- .2 Supplied by Departmental Representative at designated source.

## **Part 3 Execution**

### **3.1 EXAMINATION**

- .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 SEED BED PREPARATION**

- .1 Do not perform work under adverse field conditions as determined by Departmental Representative.
- .2 Remove and dispose of: weeds; debris; stones 50 mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Verify that grades are as per drawing. If discrepancies occur, notify Departmental Representative and commence work when instructed by Departmental Representative.

- .4 Fine grade surface free of humps and hollows to smooth, even grade, to contours and elevations indicated to tolerance of plus or minus 15 mm, surface draining naturally.
- .5 Cultivate fine graded surface approved by Departmental Representative to 25 mm depth immediately prior to seeding.

**3.3 SEED PLACEMENT**

- .1 Ensure seed is placed under supervision of Department Representative.
- .2 Apply only during calm weather and assure that enough moisture is available to ensure germination and growth.
- .3 For manual seeding:
  - .1 Use manually operated drop seeder ("Cyclone" type or equivalent).
  - .2 Use equipment and method acceptable to Departmental Representative.
  - .3 Blend applications 150 mm into adjacent grass areas to form uniform surfaces.
  - .4 Sow half of required amount of seed in one direction and remain at right angles as applicable.
  - .5 Incorporate seed by light raking in cross directions. Rake over soil by hand to assure seed is covered by soil.

**3.4 CLEANING**

- .1 Equipment to be clean on arrival to site.
  - .1 All equipment and vehicles will be made available for inspection by the Departmental Representative on arrival to site. 48 hours' notice is required for equipment inspection with the Departmental Representative. Water trucks require a written restricted activity permit from the Departmental Representative to enter the site. The permit is received at initial inspection.
  - .2 Machinery must arrive on site in a clean and dry condition and be maintained free of fluid leaks, vegetative material (i.e., invasive species, noxious weeds) and soils from off-site. All construction equipment from outside the site will be washed prior to arrival to minimize the risk of introducing weeds or aquatic invasive species. Additional weed-cleaning stations may be designated by the Departmental Representative depending on project activities and locations (see table below).

Are additional weed cleaning stations required?	Required	Location (s)	Notes

- .3 Inspect equipment daily for fluid/fuel leaks and maintain equipment in good working order.
- .4 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .5 Leave Work area clean at end of each day.
- .6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and

equipment in accordance with Section 01 74 11 - Cleaning.

- .7 Clean and reinstate areas affected by Work.
- .8 Waste Management: separate waste materials for re-use and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .9 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

### **3.5 PROTECTION**

- .1 Erect 'jack leg' barrier fencing around newly seeded areas sufficient to protect against deterioration due to pedestrian or other traffic with approval from the Departmental Representative.

### **3.6 MAINTENANCE DURING ESTABLISHMENT PERIOD**

- .1 Perform following operations from time of seed application until acceptance by the Departmental Representative:
  - .1 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
  - .2 Repair and re-seed dead or bare spots to allow establishment of seed prior to acceptance.
  - .3 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices with approval from Departmental Representative.

### **3.7 FINAL ACCEPTANCE**

- .1 Seeded areas will be accepted by Departmental Representative provided that:
  - .1 The seed has properly established itself;
  - .2 Seeded area is free of bare and dead spots;
  - .3 Seeded area is without weeds; and
  - .4 No surface soil is to be visible when material is at height of 100 mm.
- .2 Seeded areas will be accepted the following spring one month before the start of the growing season.

**END OF SECTION**

Warden's Residence Foundation Replacement  
East Gate National Historic Site  
Parks Canada Agency

Appendix A  
CONSTRUCTION DRAWINGS  
November 2018

(Attached separately: Foundation Replacement Drawings)

**COMPANY NAME**  
**EXAMPLE SPILL RESPONSE PLAN**

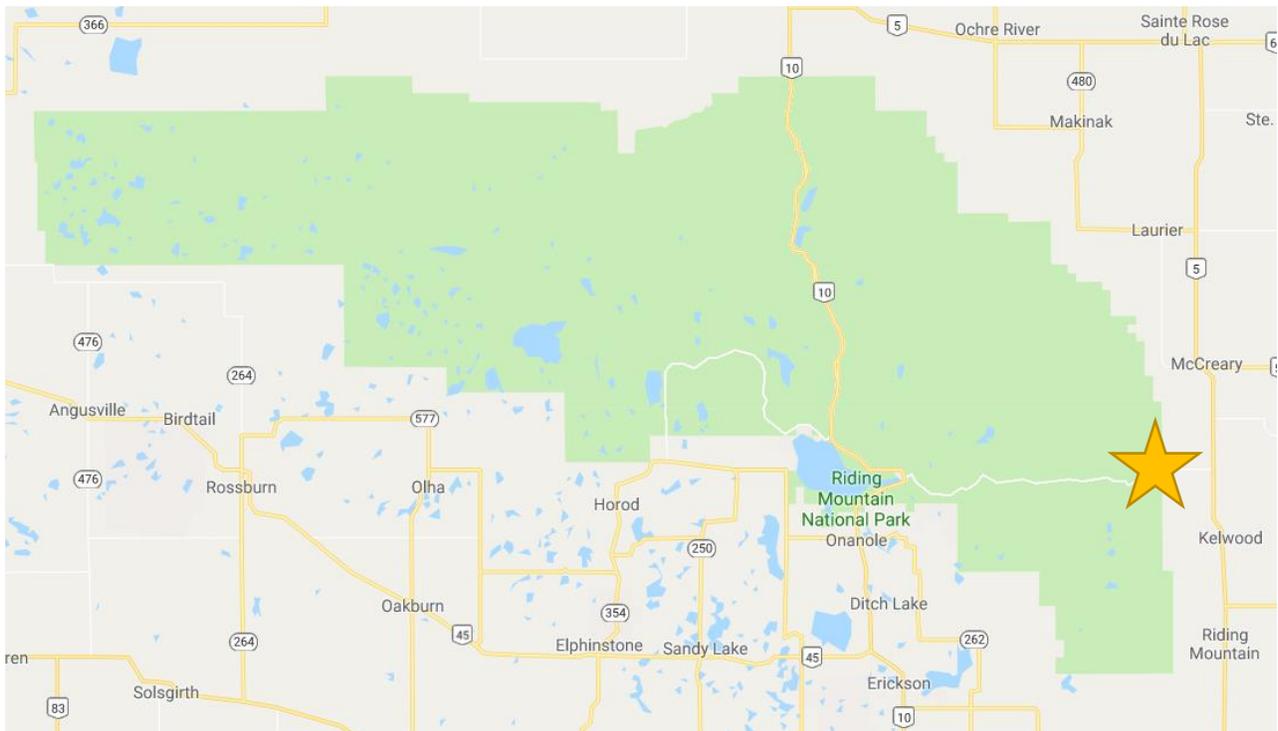
1. Ensure Safety of All Personnel
2. Determine the Chemical Spilled by Assessing the Area of Origin
3. Don Appropriate PPE
4. Assess Spill Hazards and Risks
  - Refer to MSDS and WHMIS
5. Remove all Sources of Ignition
6. Stop the Spill if Safely Possible
  - e.g.: shut off pump, replace cap, tip container, plug leaking hole. Use the contents of the nearest spill kit to aid in stopping the spill if it is safe to do so. Remember PPE (i.e.: gloves)
7. Notify Project Manager, Project Authority and RMNP Resource Conservation
  - Project Manager: JOHN SMITH; CELL (555) 555-0500; OFFICE (555) 555-7214
  - RMNP Resource Conservation through Jasper Dispatch at 1-877-852-3100
  - Environmental Surveillance Officer:
  - Project Authority:
8. Contain the spill using best method and await cleanup instructions
  - e.g.: build dyke, replace or repair leak proof container, channel spill to a contained area or container, place an empty container under the leak, shift or rotate the leaking container to stop the leak, use absorbent materials to soak up the spill or solidify it
9. After approved cleanup if performed, dispose of all materials contaminated into approved containers for proper disposal
10. Decontaminate any tools etc. that came into contact with the spill (clothing, brooms, shovels)
11. Report and record spill

EXPECTED EQUIPMENT ONSITE:

EXPECTED CHEMICALS, WASTE OR PETROLEUM PRODUCTS ONSITE:

FUELLING ONSITE? IF SO DESCRIBE (i.e.: size and location of tank)

LOCATION OF SPILL KITS ON SITE:



Google Maps (2018)

Warden's Residence Foundation Replacement  
East Gate National Historic Site  
Parks Canada Agency

Appendix D  
GEOTECHNICAL REPORT  
November 2018

(Attached separately: Riding Mountain National Park – Geotechnical Recommendations for the  
Rehabilitation of Four Buildings)

