Parks Canada Parcs Canada

SPECIFICATIONS

Parks Canada Agency

Banff Administration Building

March 2019

List of Drawings:

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 specification.

1.2 RELATED SECTIONS AND REFERENCE MATERIAL

.1 All Division 01 sections

.2 Government of Canada, Standard Acquisition Clauses and Conditions (SACC) Manual R2850D GC 5.10

.3 Appendices

.1 Appendix A – Design Drawings / Repair Details

.2 Appendix B - EA Mitigations / Best Practices

.3 Appendix C – Lead Paint Report & Recommendation

1.3 DEFINITIONS

.1 Departmental Representative: Within the context of these specifications, this refers to the person exercising the roles and attributes of Canada under the contract. Parks Canada Agency will be fulfilling the role of Departmental Representative for this Contract.

.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, as the Contractor.

1.4 PROJECT LOCATION

.1 Parks Canada Banff Administration Building. See Appendix A for location and site details.

1.5 WORKMANSHIP AND QUALIFICATIONS

.1 The masonry scope is to be completed by masonry contractors specialized in the conservation of historic masonry.

1.6 WORK COVERED BY CONTRACT DOCUMENTS

.1 Examine all drawings and specifications to ascertain the scope of work at Banff Parks Canada – Administration Building.

.2 Obtain all necessary permits as required to complete the work as described.

.3 Refer to Manufacturer's written product application data as it relates to this project.

.4 Extra care must be taken during construction to ensure that there is no moisture infiltration into the building, with particular attention to areas where there is electronic or operational equipment located below the roof. Contractor is to verify equipment location prior to start of work.

.5 Scope of work as defined on the drawings. General intent of scope of work includes, but is not limited to:

.1 Removal, repairs, and reinstatement of gutters and downspouts to facilitate masonry and roofing work.

.2 Localized masonry cleaning, masonry repairs, and masonry repointing.

.3 Complete replacement of cedar shakes on all sloped roofs and dormers with new underlayment and 3-ply cedar shakes.

.4 Complete flat roof replacement with new MBM roofing.

.5 Re-painting of all exterior wood window frames.

.6 Localized concrete repairs and handrail repairs.

.7 Removal and reinstallation of new flagpole system.

.6 In preparation for and during construction of this project the Contractor must meet the requirements of Section 01 35 43 – Environmental Procedures to ensure the desired minimum adverse effects are achieved. Prior to the commencement of construction the Contractor must provide written confirmation that he has read and understood and will comply with all mitigations of Section 01 35 43 – Environmental Procedures.

.7 Repairs and maintenance as per Appendix A - Design Drawings / Repair Details.

.8 Lead Paint abatement as per Alberta Environmental Protection Guidelines, and all recommendations in Appendix C – Lead Paint Report and Recommendation.

1.7 CONTRACT METHOD

.1 Construct work under a combined lump sum and unit rate contract.

1.8 WORK SCHEDULE

.1 Contractor Mobilization: Upon Contract Award.

.2 Contract Completion:

.1 All work to be completed no later than 28/10/2019.

.3 Within one week of contract award, submit bar chart construction schedule for work,

indicating anticipated progress stages within time of completion. Commence work only following the review and approval from the Departmental Representative.

.1 When the Departmental Representative has reviewed schedule, take necessary measures to complete work within scheduled time. Do not change schedule without notifying Departmental Representative.

.2 Include proposed dates for mock-ups in construction schedule. Provide Departmental Representative 48 hours notice for changes in scheduled mock-ups.

.4 No additional compensation will be provided to the Contractor for weather-related delays or costs.

.5 As the building will remain operational during the course of the Work, Work shall be performed in sections to ensure minimal disruption to building staff, operations, and visitors.

.1 Work for each section shall be completed prior to commencing another section.

.2 Each work area shall be cleaned and tidy, including localized landscaping, prior to commencing to a new work section.

.3 At any demobilization, the Contractor must ensure that all areas where work has commenced is completed. No work that has commenced is to be left unfinished/exposed.

.6 Work will be performed through the use of man-lifts

.1 Scaffoldings will only be used in locations inaccessible by man-lifts.

.2 Contractor to place plywood sheets overtop of sod in order to minimize damage to existing landscape.

.7 Construction will take place between the following hours: 07:30 – 21:00 on weekdays and 10:00 – 18:00 on Saturdays.

.1 Give the Departmental Representative 48 hours notice for work to be carried out outside these hours.
.2 No work is to take place from noon on Friday until 7:30 Tuesday during holiday long weekends.

.8 Maintain fire and emergency access on site at all times.

1.10 WORK BY OTHERS

.1 Where it is necessary that work is to proceed in areas of this project common to both the Contractor and forces of others, the Contractor shall cooperate with the other Contractors and the Owner in reviewing their construction schedules, sharing his work space, and shall coordinate his operations with the other Contractors, including traffic management and construction staging.

1.11 CONTRACTOR USE OF PREMISES

.1 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 Departmental Representative.

.2 Contractor shall limit use of premises for Work for storage, and for access, to allow:

.1 Owner occupancy and operations.

.2 Work by other Contractors.

.3 Coordinate use of premises under direction of the Departmental Representative.

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

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

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

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

1.12 OWNER OCCUPANCY

.1 Owner requires 24 hour access to the Administration building during entire construction period for execution of normal operations. Existing building egress locations shall be maintained at all times.

.2 Co-operate with Owner in scheduling operations to minimize conflict and to facilitate Owner usage.

1.13 CONTRACTORS CAMP

.1 For the purposes of this contract, Contractor will not be permitted to set up a camp in Banff National Park.

.2 Parks Canada regulations prohibit anyone working within the Park from using public campground facilities.

1.14 NATIONAL PARK REGULATIONS

.1 Contractor and all sub-contractors shall ensure that all work is performed in accordance with ordinances, laws, rules and regulations set out in the National Park Act.

.2 Contractor and all sub-contractors shall obtain business licenses from Parks Canada Administration Office, prior to commencement of work.

.3 Contractor and all sub-contractors shall comply with all laws and government regulations applicable to work under this contract.

.4 All Contractor's and all sub-contractor's business and private vehicles are required to obtain vehicle passes from Parks Canada Administration Office.

.5 Contractor to equip all service and supervisory vehicles with Emergency Spill Kit DOT-E-10102 or equivalent.

.6 Contractor is responsible to ensure all sub-contractors comply with the National Park Regulations.

1.15 GROUND WATER

.1 Contractor is responsible for all de-watering required to undertake the work contained in this contract. No additional payment will be made with regards to de-watering.

.2 De-watering must be performed in an environmentally-responsible manner. Discharge of water containing suspended solids must meet the approval of the Parks Canada Environmental Surveillance Officer.

1.16 SITE ACCESS

.1 Site use to be minimized and approved by Departmental Representative.

1.17 PAYMENT

.1 This is a combined Fixed Price and Unit Price Contract.

1.17 WARRANTY

.1 All work and materials will be warranted for a period of one year after completion date. Manufacturer warranty for roofing material and installation shall be as indicated on Section 07 03 32 Cedar Shake Roof and Section 07 52 00 Modified Bituminous Roof Membrane.

1.18 EXISTING SERVICES

.1 Services to the Administration Building shall be maintained at all times.

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

.3 Where Work involves breaking into or connecting to existing services, give Departmental Representative 48 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to pedestrian, vehicular traffic and staff operations.

.4 Provide alternative routes for personnel, pedestrian and vehicular traffic.

.5 Provide temporary services to maintain critical building and staff systems. Disruption of any services must occur outside of hour of operation

1.19 DOCUMENTS REQUIRED

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

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings
.5 Change Orders.
.6 Other Modifications to Contract.
.7 Field Test Reports
.8 Traffic Management Plan.
.9 Copy of Approved Work Schedule and most recent updated schedule.
.10 Health and Safety Plan and Other Safety Related Documents.
.11 Notice of Project.
.12 Other documents as specified.

1.20 CONSTRUCTION SIGNAGE

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

.2 Provide common-use signs related to safety and instructions, such as traffic control, information, instruction, use of equipment, public safety devices, etcetera, in both official languages. Signs shall be diamond grade and shall conform to CAN3-Z321.

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 USE OF SITE AND FACILITIES

.1 The Work Site limits will be specified by Parks Canada and shall only be used for the purposes of the Work. 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 Execute work with the least possible interference or disturbance to normal use of premises for staff and visitors. Make arrangements with Departmental Representative to facilitate work as stated.

.3 Office-tool trailer may be set up at site. Location of set-up to be approved by the Departmental Representative.

.4 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of source.

.5 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.

.6 Any damage to the Work Site caused by the Contractor shall be repaired by the Contractor at its expense.

1.2 ACCESS TO ADJACENT PROPERTIES

.1 Construction operations shall be conducted so as to cause minimal inconvenience to the public.

1.3 SURVEY OF EXISTING PROPERTY CONDITIONS

.1 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.

1.4 PROTECTION OF PERSONS AND PROPERTY

.1 Comply with all applicable safety regulations of the Workers' Compensation Board of Alberta (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.

1.5 USE OF PUBLIC AREAS

.1 Flag persons shall be provided when vehicles are entering or exiting Worksite access points.

.2 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.

1.6 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 Departmental Representative confirmation of the names of the supervisory personnel 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.

.3 Provide the name(s) of the supervising stone mason, complete with a full résumé of experience and references for work completed on designated historic masonry structures.

.3 The above personnel shall perform the following duties:

.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.

1.7 MEETINGS

.1 The Work includes attending meetings between the Contractor and the Departmental Representative. The meetings will be called by the Departmental Representative as required. The Contractor shall be represented at such meetings to the satisfaction of the Departmental Representative.

.2 The Departmental Representative will schedule an initial meeting to be held on site after award notification. Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

1.8 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.

1.9 BUILDING SMOKING ENVIRONMENT

.1 Smoking is not permitted.

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 11 00 – Summary of Work.

.2 Section 01 35 00 – 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, 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 – Special Procedures for Traffic Control.

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 Departmental Representative 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 MEASUREMENT FOR PAYMENT

.1 For each unit price item, Departmental Representative will calculate payment based on tendered unit price and Departmental Representative's determination of units of work item completed.

.2 For lump sum price item, Departmental Representative will calculate payment based on tendered price and Departmental Representative's estimate of percentage of work item completed.

.3 Where a method of measurement for payment for a work item is not specified, payment for that item will be deemed to be incidental to the contract price.

.4 For each unit price item that requires survey for quantity verification, the Contractor shall submit all supporting survey data in electronic format to the Departmental Representative at least 7 days before submission of progress payment.

1.2 APPLICATIONS FOR PROGRESS PAYMENT

.1 Contractor's responsibilities:

.1 Make applications for payment on account monthly as Work progresses.

.2 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Work performed and products delivered to place of work at that date.

.3 Submit progress payment application to Departmental Representative within five (5) working days after each month end.

.4 Progress payment application to show estimate of percentage of work completed against each item of Lump Sum Price Breakdown.

.5 Progress payment application to include all labour and materials incorporated in Work and all materials stored at site.

.6 Progress payment application to include all agreed extras and deductions.

.7 Supply electronic copy of documentation to support payment application for materials on site in the form of itemized lists or unpriced purchase orders showing quantities.

.8 Supply other evidence required by Department Representative in support of progress claim including survey data.

.2 Departmental Representative’s responsibilities:

.1 Review Contractor's payment application, prepare Progress Payment Certificate and issue to Parks Canada Agency within ten (10) working days following receipt of Contractor's payment application.

.2 Departmental Representative's estimate of percentage of work completed will govern calculation of payment on all Progress Payment Certificates.

.3 Inform Contractor of amendments to claim by copy of Progress Payment Certificate. This work shall be incidental to contract and will not be measured for payment.

1.3 SCHEDULE OF VALUES

.1 Provide schedule of values supported by evidence as Departmental Representative may reasonably direct and when accepted by Departmental Representative, be used as basis for applications for payment.

.2 Verify unit rate quantities with Departmental Representative on site.

.3 Include statement based on schedule of values with each application for payment.

.4 Support claims for products delivered to Place of Work but not yet incorporated into Work by such evidence as Departmental Representative may reasonably require to establish value and delivery of products.

1.4 PROGRESS PAYMENT

.1 Progress payment submission to the Departmental Representative should match the structure of the Bid and Acceptance form.

.2 Departmental Representative will issue to Owner, no later than ten (10) days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Departmental Representative determines to be due. If Departmental Representative amends application, Departmental Representative will give notification in writing to the Contractor giving reasons for amendment.

1.5 CHANGE ORDERS

.1 Complete and promptly return all contemplated change notice requests issued by Departmental Representative, quoting unit and/or lump sum prices as requested. Include appropriate supporting documentation to verify prices.

.2 Do not proceed with work affected by price request until authorized to do so by Change Order.

.3 Make no change in Work unless Change Order issued. Change Order is only valid when signed by Departmental Representative and Contractor.

1.6 SUBSTANTIAL PERFORMANCE OF WORK

.1 Prepare and submit to Departmental Representative comprehensive list of items to be completed or corrected and apply for a review by Departmental Representative to establish Substantial Performance of Work or Substantial Performance of designated portion of Work. Failure to include items on list does not alter responsibility to complete Contract.

.2 Departmental Representative shall state date of Substantial Performance of Work or designated portion of Work in certificate.

.3 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Departmental Representative, establish reasonable date for finishing Work.

1.7 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

.1 After issuance of certificate of Substantial Performance of Work:

.1 Submit application for payment of holdback amount or partial holdback amount as deemed appropriate by Departmental Representative.

.2 Submit statutory declaration that accounts for labour, subcontracts, products, construction machinery and equipment, and other indebtedness which may have been incurred in Substantial Performance of Work and for which Owner might in be held responsible have been paid in full, except for amounts properly retained as holdback or as identified amount in dispute.

.2 After receipt of application for payment and sworn statement, Departmental Representative will issue certificate for payment of holdback amount or partial holdback amount.

1.8 FINAL PAYMENT

.1 Submit application for final payment when Work is completed.

.2 Departmental Representative will review Work to verify validity of application. Departmental Representative will give notification that application is valid or give reasons why it is not valid.

.3 Departmental Representative will issue final certificate for payment when application for final payment is found valid

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 MEASUREMENT PROCEDURES

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

1.2 COORDINATION

.1 Perform coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities, and construction work, with progress of work of other Contractors, and work by Owner, under instructions of the Departmental Representative.

1.3 PROJECT MEETINGS

.1 Attend project meetings throughout progress of work and provide information as determined by the Departmental Representative. Meetings shall be chaired by the Departmental Representative who will prepare the minutes of the meetings.

.2 Attend pre-installation meetings, when specified in specifications and when required to coordinate related or affected work and provide information, as determined by the Departmental Representative.

1.4 CONSTRUCTION ORGANIZATION AND START UP

.1 Within five (5) 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 Departmental Representative who will prepare the minutes of the meeting.

.2 Senior representatives of the Owner, Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors are to be in attendance.

.3 Agenda to include 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 Requirements for temporary facilities, offices, storage sheds, utilities, and fences in accordance with Section 01 52 00.

.5 Site safety and security in accordance with Sections 01 14 00, 01 52 00 and 01 35 43.

.6 Quality Control in accordance with Section 01 45 00.

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

.8 Owner-furnished materials.

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

.10 Close out procedures and submittals in accordance with Sections 01 77 00 and 01 78 00.

.11 Insurances and transcript of policies.

.12 Other business.

.4 Comply with Departmental Representative's allocation of mobilization areas of site; for field offices and sheds, for access, traffic, and parking facilities.

.5 During construction, coordinate use of site and facilities through Departmental Representative'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 Departmental Representative for use of temporary utilities and construction facilities.

.7 Coordinate field engineering and layout work with the Departmental Representative.

1.5 ON SITE DOCUMENTS

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

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Reviewed Shop Drawings
.5 Change Orders.
.6 Other modifications to Contract.
.7 Field Test Reports
.8 Traffic Management Plan.
.9 Health and Safety Plan and Other Safety Related Documents.
.10 Copy of approved Work schedule and most recent updated schedule.
.11 Notice of Project.
.12 Other documents as specified.

1.6 PROJECT SCHEDULES

.1 Submit preliminary construction progress schedule to Departmental Representative.

.2 During progress of work revise and resubmit as directed by the Departmental Representative.

1.7 CONSTRUCTION PROGRESS MEETINGS

.1 During course of work and prior to project completion, schedule regular progress meetings as required by Departmental Representative.

.2 Contractor, major Subcontractors involved in work and Departmental Representative are to be in attendance. Meetings shall be chaired by the Departmental Representative who will prepare the minutes of the meetings.

.3 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.
.2 Review of Work progress since previous meeting.
.3 Field observations, problems, conflicts.
.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Review submittal schedules and expedite as required.

.9 Maintenance of quality standards.

.10 Review proposed changes and the effect on the construction schedule and on the completion date.

.11 Other business.

1.8 SUBMITTALS

.1 Submit product data to Section 01 33 00 for review for compliance with Contract Documents.

.2 Submit requests for payment for review, and for transmittal to Departmental Representative. Payment request on last day of the month.

.3 Submit requests for interpretation of Contract Documents, and obtain instructions through Departmental Representative.

.4 Process substitutions through Departmental Representative.

.5 Process change orders through Departmental Representative.

.6 Deliver closeout submittals for review and preliminary inspections, for transmittal to Departmental Representative.

1.9 CLOSEOUT PROCEDURES

.1 Notify Departmental Representative when Work is considered ready for Substantial Performance.

.2 Accompany Departmental Representative on preliminary inspection to determine items listed for completion or correction.

.3 Comply with Departmental Representative's instructions for correction of items of Work listed in executed certificate of Substantial Performance.

.4 Notify Departmental Representative of instructions for completion of items of Work determined in Departmental Representative's final inspection.

.5 Schedule project meetings at the call of Departmental Representative.

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

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 MEASUREMENT PROCEDURES

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

1.2 ADMINISTRATIVE

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

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

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

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

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

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

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

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

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

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

1.3 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

1.4 REQUIRED CONTRACTOR SUBMITTALS

.1 Pre-Mobilization Submittals: The Contractor shall not begin any site Work until the Departmental Representative has authorized acceptance of submittals. Submit the following plans and programs to the Departmental Representative for review prior to mobilization to the project site:

.1 Project schedule.

.2 List of subcontractors, suppliers and consultants, their role and their key personnel, including names and positions, addresses, telephone and cellular telephone numbers, as requested by Departmental Representative.

.3 Plan describing methods the Contractor will have to meet his responsibilities as the Prime Contractor for Traffic Control in the Work zones.

.4 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.

.5 Contractor shall develop an "Emergency Procedures Protocol" in consultation with Parks Canada.

.2 Construction Phase Submittals

.1 Progress Reports that outline the detailed Work (Contractor, subcontractors, 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.

.3 The Contractor shall not construe the Departmental Representative'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.

1.5 SHOP DRAWINGS AND PRODUCT DATA

.1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data, which are to be provided by Contractor to illustrate details of a portion of Work.

.2 All submittals shall be in electronic format (pdf).

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

.4 Allow five (5) business days for the Departmental Representative's review of each submission.

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

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

.7 Accompany submissions with transmittal letter, containing:

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

.8 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:
  - .1 Subcontractor.
  - .2 Supplier.
  - .3 Manufacturer.
- .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
- .5 Details of appropriate portions of Work as applicable:
  - .1 Fabrication.
  - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
  - .3 Setting or erection details.
  - .4 Capacities.
  - .5 Performance characteristics.
  - .6 Standards.
  - .7 Operating weight.
  - .8 Wiring diagrams.
  - .9 Single line and schematic diagrams.
  - .10 Relationship to adjacent work.

.9 After the Departmental Representative's review, distribute copies.

.10 Submit shop drawings for each requirement requested in specification Sections and as the Departmental Representative may reasonably request.

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

.12 Submit test reports for requirements requested in specification Sections and as requested by the Departmental Representative.

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

.13 Submit certificates for requirements requested in specification Sections and as requested by the Departmental Representative.

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

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

.14 Submit manufacturer’s instructions for requirements requested in specification Sections and as requested by the Departmental Representative.

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

.15 Submit Manufacturer's Field Reports for requirements requested in specification Sections and as requested by the Departmental Representative.

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

.17 Submit Operation and Maintenance Data for requirements requested in specification Sections and as requested by the Departmental Representative.

.18 Delete information not applicable to project.

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

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

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

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

.1 Do not construct, fabricate or deliver parts of the Work requiring shop drawings prior to review and acceptance by the Departmental Representative.

.22 Contractor is responsible for dimensions to be confirmed and correlated at job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of Work of sub-trades.

1.6 SAMPLES

.1 Samples: examples of materials, equipment, quality, finishes, workmanship.

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

.3 Deliver samples prepaid the Departmental Representative.

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

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

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

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

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

1.7 MOCK-UPS

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

1.8 PROGRESS PHOTOGRAPHS

.1 Perform pre-construction survey:

.1 Prior to commencing a new area of work, submit notice to proceed with record photographs showing the existing building condition.

.2 Submit record photographs of surrounding properties, objects and structures that could be damaged of be the subject of subsequent claims.

.2 Record photographs:

.1 As work progresses, maintain accurate photo record including daily photographs or preparatory work and stages of repairs, including, but not limited to:

.1 Existing conditions before Contractor mobilization;

.2 Cedar, metal, and flat roof removal;

.3 Roof flashing removal;

.4 Gutter removal;

.5 Masonry dismantling, raking, and repointing;

.6 Masonry helical tie installation;

.7 Masonry Dutchman installation;

.8 Masonry cleaning;

.9 Installation of waterproofing, breather layer, and shakes;

.10 Installation of copper flashing and roofing;

.11 Installation of flat roof;

.12 Gutter and downpipe fabrication and installation.

.2 Submit electronic copies of photographs weekly to Departmental Representative.

.3 Contractor to maintain a backup copy of all submitted digital photographs in an off-site location for the duration of the project. The file naming and file structure for this backup is to be as directed by the Departmental Representative.

.1 Contractor to provide copy of Backup copy to the Departmental Representative at the conclusion of the project on solid state hard drives sized to hold the photographic record on one unit.

1.9 CERTIFICATES AND TRANSCRIPTS

.1 Immediately after award of Contract, submit Workers' Compensation Board status.

.2 Submit transcription of insurance immediately after award of Contract.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 01 11 00 – Summary of Work

.2 01 25 20 – Mobilization and Demobilization

1.2 MEASUREMENT PROCEDURES

.1 Cost of Traffic Control shall be considered incidental to "Lump Sum Price Item 1.0 – Mobilization and Demobilization", and no additional payment will be made for the duration of the Contract.

.2 Cost of snow removal for Contractor to do the work identified in the Contract while Contractor is on site shall be considered incidental to "Lump Sum Price Item 1.0 – Mobilization and Demobilization", and no additional payment will be made for the duration of the Contract. This excludes snow removal on Public roads.

1.3 REFERENCES

.1 The Contractor shall provide traffic control in accordance with current edition of:

.1 Alberta Transportation – Traffic Accommodation in Work Zones.

.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 AT - Traffic Accommodation in Work Zones, 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, other safety measures and provide staff to ensure safe passage of all traffic from commencement of site work to date of acceptance by the Departmental Representative.

.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.

.5 Continually maintain traffic-control devices in use by:

.1 Checking signs daily for legibility, damage, suitability and location; clean, repair or replace to ensure clarity and reflectance;

.2 Removing or covering signs which do not apply to conditions existing from day to day

1.6 PROTECTION AND MAINTENANCE OF TRAFFIC

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

.2 Maintain access and haul roads as necessary.

.3 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.

.4 Provide snow removal during period of Work.

.5 No offloading of material on roadways without Departmental Representative written approval.

1.7 SUBMITTALS

.1 Submit detailed Traffic Management Plan to Departmental Representative no later than five (5) days after award of contract and prior to mobilizing on site.

.1 Identify vehicle traffic flow distinguished by size of vehicles where applicable.

.2 Show access points to approved site.

.3 Show safe routes for pedestrian traffic flow.

.4 Include the location of the proposed signage for traffic control including content.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Alberta

.1 Occupational Health and Safety Act, R.S.A. 2000.

1.2 SUBMITTALS

.1 Make submittals to Departmental Representative in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit the following:

.1 Health and Safety Plan within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

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

.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 Submit complete set of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials, and all other documentation required by the Workplace Hazardous Materials Information System (WHMIS) requirements.

.3 The Departmental Representative will review the Contractor's site-specific Health and Safety Plan and emergency procedures and provide comments to the Contractor within seven (7) business days after receipt of plan. Revise plan as appropriate and resubmit to Departmental Representative.

.4 Medical Surveillance: where prescribed by legislation, regulation or safety program, submit certification of medical surveillance for site personnel prior to commencement of Work, and submit additional certifications for any new site personnel to Departmental Representative

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

1.3 HEALTH AND SAFETY PLAN

.1 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.

.2 Conduct a site-specific hazard assessment based on review of Contract documents, required work, and project site. Identify any known and potential health risk and safety hazards.

.3 Prepare and comply with a site-specific project Health and Safety Plan based on hazard assessment, including but not limited to, the following:

.1 Primary requirements:

.1 Contractor's safety policy.

.2 Identification of applicable compliance obligations.

.3 Definition of responsibilities for project safety/organization chart for project.

.4 General safety rules for projects.

.5 Job-specific safe work, procedures.

.6 Inspection policy and procedures.

.7 Incident reporting and investigation policy and procedures.

.8 Occupational Health and Safety Committee/Representative procedures.

.9 Occupational Health and Safety meetings.

.10 Occupational Health and Safety communications and record keeping procedures.

.2 Include summary of health risks and safety hazards resulting from analysis of hazard assessment, with respect to site tasks and operations which must be performed as part of the work.

.3 List hazardous materials to be brought on site as required by work.

.4 Indicate engineering and administrative control measures to be implemented at the site for managing identified risks and hazards.

.5 Identify personal protective equipment (PPE) to be used by workers.

.6 Identify personnel and alternates responsible for site safety and health.

.7 Identify personnel training requirements and training plan, including site orientation or new works.

.4 Develop the plan in collaboration with all subcontractors. Ensure that work/activities of subcontractors are included in the hazard assessment and are reflected in the plan.

.5 Revise and update Health and Safety Plan as required, and re-submit to Departmental Representative.

.6 Submission and resubmission of the Health and Safety Plan to the Departmental Representative is for information and reference purposes only. It shall not:

.1 Be continued to imply approval by the Departmental Representative.

.2 Be interpreted as a warranty of being complete, accurate and legislatively compliant.

.3 Relieve the Contractor of his legal obligations for the provision of health and safety on the project.

1.4 SAFETY ASSESSMENT

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

1.5 MEETINGS

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

1.6 REGULATORY REQUIREMENTS

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

1.7 GENERAL REQUIREMENTS

.1 Develop a 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.

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

1.8 RESPONSIBILITY

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

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

1.9 COMPLIANCE REQUIREMENTS

.1 Comply with Occupational Health and Safety Act, General Safety Regulation, Alberta.

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

1.10 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 Departmental Representative verbally and in writing.

1.11 HEALTH AND SAFETY CO-ORDINATOR

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

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

.2 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.

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

.4 Be on site during execution of Work and report directly to and be under direction of site supervisor.

1.12 ACCIDENT AND INCIDENT REPORTS

.1 The general contractor shall advise the Departmental Representative of any accident, injury, near-miss incident, fire, explosion or chemical spill occurring at the Work site and to any governmental official visiting the site.

.2 The general contractor shall provide a written report within 24 hours of any accident, injury, near-miss incident, fire explosion or chemical spill.

1.13 POSTING OF DOCUMENTS

.1 Post legible versions of the following documents on site:

.1 Health and Safety Plan.

.2 Sequence of Work.

.3 Emergency procedures.

.4 Site drawing showing project layout, locations of the first-aid station, evacuation route and marshalling station, and the emergency transportation provisions.

.5 Notice of Project.

.6 Site plans.

.7 Notice as to where a copy of the Workers' Compensation Act and Regulations are available on the work site for review by employees and workers.

.8 Workplace Hazardous Materials Information System (WHMIS) documents.

.9 Material Safety Data Sheets (MSDS).

.10 List of names of Joint Health and Safety Committee members, or Health and

.11 Safety Representative, as applicable.

.2 Post all Material Safety Data Sheets (MSDS) on site, in a common area, visible to all works and in locations accessible to tenants when work of this Contract includes construction activities adjacent to occupied areas.

.3 Postings should be protected from the weather, and posted in conspicuous location in shop in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.

1.14 CORRECTION OF NON-COMPLIANCE

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

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

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

1.15 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 DEFINITIONS

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

.2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.

1.2 ENVIRONMENTAL PROTECTION PLAN

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

.2 Prior to commencing construction activities or delivery of materials to site, submit Environmental Protection Plan for review and approval by the Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during construction. Review and reference Appendix B - Mitigation Measures for Reducing Impact on Building Projects.

.3 Address topics at level of detail commensurate with environmental issue and required construction tasks.

.4 Environmental protection plan to include:

.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.

.2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.

.3 Names and qualifications of persons responsible for training site personnel.

.4 Descriptions of environmental protection personnel training program.

.5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.

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

.7 Traffic control plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.

.8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas including methods for protection of features to be preserved within authorized work areas.

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

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

.11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.

.12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.

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

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

.15 Pesticide treatment plan: to be included and updated, as required.

1.3 FIRES

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

1.4 DISPOSAL OF WASTES

.1 Do not bury rubbish and waste materials on site unless approved by the Departmental Representative.

.2 Separate and recycle all materials that can be recycled.

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

1.5 DRAINAGE

.1 Provide temporary drainage and pumping as necessary to keep site free from water.

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

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

1.6 SITE CLEARING AND PLANT PROTECTION

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

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

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

.4 Minimize stripping of topsoil and vegetation.

.5 Restrict tree removal to areas indicated or designated by the Departmental Representative.

1.7 POLLUTION CONTROL

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

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

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

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

.5 Prevent any deleterious and objectionable materials from entering streams, rivers, wetlands, water bodies or watercourses that would result in damage to aquatic and riparian habitat. Hazardous or toxic products shall be stored no closer than 30 metres from watercourses.

.6 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. Hazardous products shall be stored no closer than 100 metres from watercourses.

.7 The Contractor shall prevent blowing dust and debris by covering and/or providing dust control for temporary roads and on-site work by methods that are approved by the Departmental Representative or ESO.

.8 The Contractor shall provide spill kits at re-fuelling, lubrication, and repair locations that will be capable of dealing with 110% of the largest potential spill and shall be maintained in good working order on the construction site. The ESO and Departmental Representative prior to project start-up must approve these spill kits. The Contractor and site staff shall be informed of the location of the spill response kit(s) and be trained in its use.

.9 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 Departmental Representative and the ESO shall be notified immediately of any spill.

.10 In the event of a major spill, all other work shall be stopped and all personnel devoted to spill containment and clean up.

.11 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 Departmental Representative and ESO.

1.8 NOTIFICATION OF NON-COMPLIANCE

.1 The Departmental Representative will notify Contractor in writing of observed non-compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.

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

.3 The Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.

.4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

1.9 MONITORING

.1 Parks Canada will have an ESO or alternate designated Parks Canada staff member attending the site to monitor the construction activity for conformance with the Environmental Procedures. The ESO's main duties are to monitor the progress of the construction on an on-going basis to ensure compliance with environmental protection measures, and to provide guidance through the Departmental Representative, in the event of unanticipated environmental problems.

1.10 OPERATION, MAINTENANCE AND CLEANING OF EQUIPMENT

.1 Restrict vehicle movements to work limits.

.2 Workers private vehicles are to remain within the construction footprint.

.3 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.

.4 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 the Banff National Park before delivery to the work site.

.5 The Contractor shall ensure that all equipment is inspected daily for fluid/fuel leaks and maintained in good working order.

.6 Fuel containers and lubricant products shall be stored only in secure locations specified by the Departmental Representative. 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. Alternatively, the Contractor may hire a security person employed to prevent vandalism.

.7 Provide drip trays to prevent the discharge of oil, grease, antifreeze, or any other deleterious materials into the ground.

.8 Equipment and heavy machinery used to meet or exceed all applicable emission requirements.

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

.10 All vehicle/equipment maintenance and refuelling must be conducted over impermeable surfaces situated at a designated site that is located at least fifteen (15) metres away from the nearest water body. In the case of machinery that must be within fifteen (15) metres of a water body, a large drip pan to contain any leakage from heater or re-fuelling operations must be placed.

.11 Use trigger-operated spray nozzles for water hoses when cleaning concrete equipment.

.12 Equipment and tools are to be cleaned in the staging area only as approved by the Departmental Representative, or off-site.

1.11 FIRE PREVENTION AND CONTROL

.1 A fire extinguisher shall be carried and available for use on each machine and at locations within the site in the event of fire. Contractor's staff shall receive basic training in early response to wildfire events during the "environmental briefing".

.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 In case of fire, the Contractor or worker shall take immediate action to extinguish the fire provided it is safe to do so. The Departmental Representative shall be notified of any fire immediately.

.4 Fires or burning of waste materials is not permitted.

1.12 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.

.2 Construction, trade, hazardous waste and domestic waste materials shall not be burned, buried or discarded at the construction site. These wastes shall be contained and removed in a timely and approved manner by the Contractor and workers, and disposed of at an appropriate waste landfill site.

.3 A concerted effort shall be made by the Contractor and workers to reduce, reuse and recycle materials.

.4 Sanitary facilities, such as a portable container toilet, shall be provided by the Contractor and maintained in a clean condition.

1.13 MISCELLANEOUS SITE MANAGEMENT CONTINGENCIES

.1 If required, a Contractor's office and work headquarters material laydown, equipment parking and storage area will be permitted at the work site.

.2 The Contractor shall control blowing dust and debris generated from the construction site by means such as covering or wetting down dry materials and rubbish. Dust control measures for temporary access roads may also have to be initiated.

.3 Security services at the construction site may be desirable or necessary during the contract, especially during quiet times. Fuel tanks or other potentially deleterious substance containers must be secured by the Contractor to ensure they are tamperproof and cannot be drained by vandals at his own cost.

.4 Pets shall not be brought to or maintained at the construction site.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 SPECIFIC CONCERNS RELATIVE TO EROSION CONTROL AND SEDIMENTATION

.1 An important desired end result is to allow no release into watercourses of sediments in levels that are deleterious to fish or that would harmfully alter, disrupt, or destroy fish habitat. Similarly there is to be no sediment release into areas of vegetation growth or sensitive areas of sediments in levels that would adversely alter growing or hydraulic conditions.

3.2 CLEANING

.1 Clean up work area as work progresses. At the end of each work period, and more often if ordered by the Departmental Representative, remove debris from site, neatly stack material for use, and clean up generally.

.2 Permit no undue amounts of debris, trash or garbage to accumulate.

.3 Ensure all emptied containers are sealed and stored safely for disposal away from public access.

END OF SECTION

Part 1 General

1.1 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.

1.2 WHMIS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of material safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

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 Banff 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 RELATED SECTIONS

.1 All Division sections

1.2 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.

1.3 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by the Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the 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 the Minister at no cost to the Departmental Representative. Pay costs for retesting and re-inspection.

1.4 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.

1.5 PROCEDURES

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

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

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

1.6 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.

1.7 REPORTS

.1 Submit 1 copy of inspection and test reports to the Departmental Representative.

.2 Provide 1 copy to subcontractor of work being inspected or tested manufacturer or fabricator of material being inspected or tested.

.3 Include copy of all inspection and test reports in Commissioning Manuals.

1.8 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 the Departmental Representative and may be authorized as recoverable.

1.9 MOCK-UPS

.1 Prepare mock-ups for Work specifically requested in specifications.

.2 Construct in locations acceptable to the Departmental Representative.

.3 Use material in the mock-up that will be used in the work.

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

.1 All mock-ups to be identified in the project schedule. Provide Departmental Representative 48 hours’ notice for any changes in the scheduled mock-ups.

.5 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.

.6 Reviewed and accepted mock-ups will become standards of workmanship and material against which installed work will be verified.

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

.8 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

Part 3 Execution

3.1 NOT USED

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Not used.

1.2 SUBMITTALS

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

1.3 INSTALLATION AND REMOVAL

.1 Provide temporary utilities controls in order to execute work expeditiously.

.2 Remove from site all such work after use.

1.4 WATER SUPPLY

.1 Departmental Representative will provide continuous supply of potable water for construction use.

.2 Arrange for connection with appropriate utility company and pay costs for installation, maintenance and removal.

.3 Contractor will pay for utility charges at prevailing rates.

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 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.

.2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.

.3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

.4 Ventilate storage spaces containing hazardous or volatile materials.

.5 Ventilate temporary sanitary facilities.

.6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.

.6 Permanent heating system of building, not to be used when available. Be responsible for damage to heating system if use is permitted.

.7 Contractor will pay costs for maintaining temporary heat, not connected to building heating system.

.8 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.

.9 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 will provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.

.2 Arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.

.3 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors and stairs is not less than 162 lx.

1.7 FIRE PROTECTION

.1 Provide and maintain temporary fire protection equipment during performance of Work required by insurance companies having jurisdiction and governing codes, regulations and bylaws.

.2 Burning rubbish and construction waste materials is not permitted on site.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International)

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

.2 CSA Z797-09(R2014) – Code of Practice for Access Scaffold.

1.2 SUBMITTALS

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

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.

.1 Areas of work to be fenced off and used by Contractor will be identified according to sequence of phased work.

.2 Following the phased work sequence, the area of work is to be returned to the original or better condition before moving onto a new section/phase of work.

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

.3 Indicate use of supplemental or other staging area.

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

.5 Remove from site all such work after use.

1.4 SCAFFOLDING

.1 Scaffolding in accordance with CAN/CSA-S269.2 and Section 01 54 23 - Scaffolding.

.2 To minimize impact on site, use scaffolding only in places inaccessible by man-lifts.

.3 Provide and maintain scaffolding, ramps, ladders, platforms and temporary stairs.

1.5 HOISTING

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

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.

1.7 CONSTRUCTION PARKING

.1 Provide and maintain minimal access and parking at the project site in areas approved by the Departmental Representative. Limited parking will be permitted on site.

.2 If authorized to use existing roads for access to project site, maintain such roads for duration of Contract and make good damage resulting from Contractors' use of roads.

1.8 CONSTRUCTION SIGNAGE

.1 No other signs or advertisements, other than warning and traffic control signs, are permitted on site.

.1 All warning and traffic control signage will be located appropriately depending on phase and location of work.

.2 Signs and notices for safety and instruction shall be in both official languages Graphic symbols shall conform to CAN3 Z321.

1.9 SECURITY

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

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.11 SANITARY FACILITIES

.1 Provide sanitary facilities for work force in accordance with governing regulations, ordinances and Section 01 35 43 – Environmental Procedures.

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

1.12 PROTECTION AND MAINTENANCE OF TRAFFIC

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

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

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

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

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

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

.7 Construct access and haul roads as necessary.

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

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

.9 Provide adequate dust control to ensure safe operation at all times.

.10 Location, grade, width, and alignment of construction and hauling roads are subject to approval by the Minister.

.11 Provide lighting to assure full and clear visibility for full width of haul road and work areas during night work operations.

.12 Provide snow removal during period of Work.

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

1.13 CLEAN-UP

.1 Restore all existing areas and sitework damaged or disturbed due to earthwork or other work of this Contract, back to their original condition.

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

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

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

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

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

.1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.

.2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.

.3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 52 00 – Construction Facilities.

1.2 TEMPORARY SCAFFOLDING & PLATFORMS

.1 To minimize site disturbance, provide scaffolding and platforms only in areas inaccessible by man-lifts. Scaffolding locations shall be approved by the Departmental Representative.

.2 Scaffolding refers to both stationary and suspended (swing stage) scaffolding type systems.

.3 Design, supply, erect, and maintain scaffolding to facilitate restoration work, including bracing, tie-backs, outriggers, guardrails, toe boards, platforms, access stairs and ladders.

.4 Design, supply, erection and maintenance of hoarding to protect public, workers, and public and private property from injury or damage.

.5 Provide weather-tight enclosures for scaffolding, as required.

.6 Perform daily scaffolding safety inspections throughout construction and maintain safety of workers and pedestrians.

1.3 REFERENCES

.1 Applicable Building Codes / Building By-Laws, most recent edition.

.2 CAN/CSA-S269.2 *Access Scaffolding for Construction Purposes*.

.3 CAN/CSA-Z271 *Safety Code for Suspended Elevating Platforms*.

.4 *Workers' Compensation Act* and *Workers' Compensation Amendment Act* (2002).

.5 *Occupational Health and Safety Regulation* of Alberta.

1.4 DESIGN REQUIREMENTS

.1 Scaffolding to be designed in compliance with requirements of referenced standards and codes.

.2 Structural Support:

.1 Verify bearing condition of soil and supporting structure.

.2 Where existing structure is to be used for structural support of scaffolding, verify that existing structure can safely support resultant imposed loads. Should existing structure require strengthening for support of scaffolding, provide details from professional engineer for shoring or strengthening requirements.

.3 When relying on structural integrity of existing exterior building walls for lateral support of scaffolding, establish whether existing wall components can adequately support additional lateral loads.

.1 Provide adequate anchorage for lateral supports of scaffolding and restore existing wall to original condition after removal of scaffolding anchorage.

.2 Required anchorage to the building will be through mortar joints. Anchorage through the stone face will not be accepted.

.3 All efforts will be made to minimize damage to building resulting from required anchorage.

.3 Enclosure

.1 When required, equip scaffolding with enclosure capable of providing protection to pedestrians and adjacent property from dust, dirt, debris, water spray, falling tools and materials, and any other related workplace hazards.

.2 Design and construct enclosed scaffolding and weather enclosures to withstand wind pressure / wind loads and snow loads.

.4 Access to Stationary Scaffolding

.1 Provide stairs or fixed vertical ladders to access all working levels of stationary scaffolding.

.2 Equip stairs and landings with handrails/railings such that if a worker trips and falls while descending stairs, it will not be possible for worker to fall through railing system.

.3 Surround stair openings on planked working areas of stationary scaffolding by railings to prevent workers from walking into back or sides of open stair.

.5 Working Platforms

.1 Ensure that levels of scaffolding designated for work are fully planked. Do not remove isolated areas of planking on fully-planked working platforms. Replace damaged planks immediately.

.2 If fully-planked working platforms are not required or a partially-planked platform is required to facilitate lowering or raising material, install guardrails to prevent workers from falling off partially-planked platform.

.3 With exception of front of stair openings, ensure all openings in working platforms are equipped with railings to prevent workers from accidentally walking into openings.

.6 Suspended Scaffolding

.1 Suspended scaffolding cannot be moved up or down if scaffold work platforms are more than 10% out of level.

.2 Suspended platforms are to be operated with power units equipped with positive pressure controls (i.e., dead-man switch and positive drives for raising and lowering scaffold).

.3 Parapet clamps are not permitted. Support of suspended scaffolding is to be independent of building parapet.

1.5 SUBMITTALS

.1 Prior to erecting scaffolding, prepare and submit erection drawing and connection details for review by Departmental Representative. Departmental Representative review does not relieve Contractor from any contractual requirement or responsibility.

.2 Erection drawings are to include:

- .1 Reference specifications, materials and sizes for structural members.
- .2 Main dimensions of scaffolding.
- .3 Locations of tiebacks and bracing.
- .4 Guardrails.
- .5 Planking.
- .6 Stairs.
- .7 Ladders.
- .8 Where necessary, shoring or strengthening of existing structures.
- .9 Connection details.
- .10 Support details for suspended scaffolding.
- .11 Tieback arrangement for suspended scaffolding.
- .12 Counterweight arrangement and outrigger design for suspended scaffolding.

1.6 CERTIFICATIONS

.1 After scaffolding is erected, provide written certification from professional engineer that scaffolding is erected in accordance with reviewed erection drawings.

.2 Report any revisions to lateral and gravity support arrangements to professional engineer who certified erection drawings. In addition, obtain certification from professional engineer that revisions have been reviewed and are acceptable.

Part 2 PRODUCTS

2.1 SCAFFOLDING COMPONENTS

.1 Obtain metal scaffolding components from a single source (supplier) for metal scaffolding.

.2 Obtain test data and test information from supplier; submit to Consultant upon request.

Part 3 EXECUTION

3.1 PREPARATION

.1 Prepare surfaces in accordance with manufacturer’s directions.

3.2 ERECTION

.1 Erect scaffolding in accordance with erection drawings and in compliance with requirements of referenced standards and codes.

.2 Install self-adhesive membrane on top of sheathing paper at locations where there are scaffold tiebacks penetrating sheathing paper. Seal membrane penetrations with mastic at time of tieback removal.

.3 Operate suspended scaffolding in accordance with rules and regulations set out in referenced standards.

.4 Erect and operate commercially-manufactured suspended scaffolds in accordance with written operating procedures developed by manufacturer and in accordance with professional engineer's design, including instructions on erection, use and design.

.5 When not in use, lash suspended scaffolding to structure or lower suspended scaffolding to ground and secure. Secure suspension lines and safety ropes to prevent damage.

.6 Persons entering or exiting suspended scaffolding and persons working on or from suspended scaffolding must use a fall arrest system, including lifeline and rope grip.

.7 Barricade area below suspended scaffolding or provide means of overhead protection, such as personal net or debris net. Post highly-visible warning signs to notify public of potential hazard overhead.

.8 Protect supporting components of suspended scaffolding, such as suspension lines, tie-backs, lifelines and any other component made of rope, from damage by corrosion, abrasion, foreign materials, heat, or work activities that might damage rope or internal hoist mechanism.

3.3 INSPECTION

.1 Perform daily safety inspection of scaffolding throughout construction. Repair or replace components as necessary to ensure continued safety of workers and public.

3.4 REPAIR / RESTORATION

.1 Make good all damage to existing building caused by erection and dismantling of scaffolding and by loads imposed by scaffolding.

END OF SECTION

Part 1 General

1.1 REFERENCES

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

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

.3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.

1.2 INSTALLATION AND REMOVAL

.1 Provide temporary controls in order to execute Work expeditiously and minimize construction footprint.

.2 Remove from site all such work after use.

1.3 HOARDING

.1 Erect temporary site enclosures around area of work.

.2 Provide one lockable truck entrance gate and at least one pedestrian door as directed and conforming to applicable traffic restrictions on adjacent streets. Equip gates with locks and keys.

.3 Maintain hoarding enclosure in good repair.

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

1.4 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around open shafts, open stair wells, open edges of floors and roofs.

.2 Provide as required by governing authorities.

1.5 WEATHER ENCLOSURES

.1 Provide weather tight closures to unfinished door and window openings, tops of shafts and other openings in floors and roofs.

.2 Design enclosures to withstand wind pressure and snow loading.

1.6 ACCESS TO SITE

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

1.7 PUBLIC TRAFFIC FLOW

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

1.8 FIRE ROUTES

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

1.9 Dust Tight Screens

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

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

1.10 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.

1.11 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 Confirm with Departmental Representative locations and installation schedule 3 days prior to installation.

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

1.12 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 HOARDING

.1 Make all effort to reduce impact of hoarding on occupants and to minimize duration of hoarding in any one location any longer than is necessary to complete work.

.2 Provide hoarding in accordance with rules and regulations set forth in referenced standards.

.3 Provide hoarding protection at areas of work, as identified in the scope of work.

.4 Maintain hoarding in good condition at all times.

.5 Repair damaged hoarding to satisfaction of Departmental Representative.

.6 Maintain environmental conditions, including temperature, within hoarding to allow for continuous work.

.7 Keep hoarding clean at all times.

.8 Remove hoarding from site only when authorized by the Departmental Representative.

END OF SECTION

Part 1 General

1.1 ADMINISTRATIVE

.1 Use new material and equipment unless otherwise specified.

.2 Within seven (7) days of contract awarded by Departmental Representative, submit following information for materials and equipment proposed for supply:

- .1 name and address of manufacturer,
- .2 trade name, model and catalogue number,
- .3 performance, descriptive and test data,
- .4 manufacturer installation or application instructions, and
- .5 evidence of arrangement to procure.

.3 Use products of one manufacturer for material and equipment of same type or classification unless otherwise specified.

.4 Do not change manufacturer brands or sources of supply of materials identified in specified and accepted submittals during contract.

1.2 MANUFACTURER 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.

1.3 QUALITY OF MATERIAL

.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.

1.4 QUALITY OF WORK

.1 Carry out work using qualified licensed workers or apprentices in accordance with Provincial Act respecting manpower vocational training and qualification.

.2 Permit employees registered in Provincial apprenticeship program to perform specific tasks only if under direct supervision of qualified licensed workers.

.3 Determine permitted activities and tasks by apprentices, based on level of training attended and demonstration of ability to perform specific duties.

.4 Where licensed workers or apprentices are not covered by provincial act. The worker or apprentice must have necessary education, training and experience to perform the work.

.5 Workers or apprentices who do not demonstrate the ability to do work to the satisfaction of the Departmental Representative are not to work on the project and are replaced a competent workers or apprentices to the approval of the Departmental Representative.

1.5 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.

1.6 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 siding 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.

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

.11 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove damaged, opened, and rejected materials from site.

.12 Store material and equipment to manufacturer instructions unless otherwise specified. Locate products stored inside away from heavy traffic areas. Condition products for use in accordance with manufacturer's recommendations.

.13 Replace products with damage to factory-applied finishes at own cost. If Departmental Representative permits touch-up work, use primers and paints that are compatible and match factory original. Do not paint over nameplates.

.14 Keep areas used for delivery, storage, and handling clean and orderly to approval of Departmental Representative. After completion of operations, return areas to clean condition to approval of Departmental Representative.

1.7 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.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PROJECT CLEANLINESS

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

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative.

.3 Clear snow and ice from access to building, bank/pile snow in designated areas only.

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

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

.6 Provide and use marked separate bins for recycling.

.7 Dispose of waste materials and debris off site.

.1 All copper removed as part of the Work will be returned to the Parks Canada Agency.

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

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

.10 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.

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

.12 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 including that caused by Owner or other Contractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.

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

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

or disfigured glass as directed by the Departmental Representative.

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

.9 Vacuum clean and dust building interiors, behind grilles, louvres and screens.

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

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

.12 Remove dirt and other disfiguration from exterior surfaces.

.13 Clean and sweep roofs, gutters, areaways, and sunken wells.

.14 Sweep and wash clean paved areas.

.15 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.

.16 Clean roofs, downspouts, and drainage systems.

.17 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.

.18 Remove snow and ice from access to building.

1.3 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Definitions:

.1 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 Inert Fill: inert waste - exclusively asphalt and concrete.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

.2 Conform to all municipal landfill bans

1.2 DOCUMENTS

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

.1 Waste Source Separation Program.

1.3 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 Waste Source Separation Program (WSSP).

1.4 WASTE SOURCE SEPARATION PROGRAM (WSSP)

.1 As part of Waste Reduction Workplan, prepare WSSP prior to project start-up.

.2 WSSP will detail methodology and planned on-site activities for separation of reusable and recyclable materials from waste intended for landfill.

.3 Provide list and drawings of locations that will be made available for sorting, collection, handling and storage of anticipated quantities of reusable and recyclable materials.

.4 Provide sufficient on-site facilities and containers for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.

.5 Locate containers to facilitate deposit of materials without hindering daily operations.

.6 Provide training for contractor, sub-contractors and workers in handling and separation of materials for reuse and/or recycling.

.7 Locate separated materials in areas which minimizes material damage.

.8 Clearly and securely label containers to identify types/conditions of materials accepted and assist contractor, sub-contractors and workers in separating materials accordingly.

.9 Monitor on-site waste management activities by conducting periodic site inspections to verify: state of signage, contamination levels, bin locations and condition, personnel participation, use of waste tracking forms and collection of waybills, receipts and invoices.

.10 On-site sale of salvaged materials is not permitted unless authorized in writing by Departmental Representative and provided that site safety regulations and security requirements are adhered to.

1.5 USE OF SITE AND FACILITIES

.1 As the building will remain operational during work, work is to be executed with minimal interference and disturbance to normal use of premises.

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

1.6 WASTE PROCESSING SITES

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

.1 All copper waste from work will be returned to PCA.

1.7 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 bi-weekly Waste Diversion Report summary to be provided by Waste Management Coordinator (refer to the Waste Diversion Report form in Schedule C and Waste Materials Tracking form in Schedule D).

1.8 STORAGE, HANDLING AND PROTECTION

.1 Store materials to be reused, recycled and salvaged in locations as directed by Departmental Representative for removal. Contractor to discuss with Departmental Representative on items that become Owner’s and Contractor's property.

.1 All copper waste from work will be returned to PCA.

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

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

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

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

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

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

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

.9 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.

1.9 DISPOSAL OF WASTES

.1 Do not bury rubbish or waste materials.

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

.3 Keep records of construction waste including:

.1 Number and size of bins.

.2 Waste type of each bin.

.3 Total tonnage generated.

.4 Tonnage reused or recycled.

.5 Reused or recycled waste destination.

.4 Remove materials on-site as Work progresses.

.5 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in the waste audit.

1.10 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

Part 3 Execution

3.1 APPLICATION

.1 Do Work in compliance with 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

.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, recovered, reusable, recyclable material (s) is only permitted as arranged by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SUBMITTALS

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

.2 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, two final copies of operating and maintenance manuals in English.

- .1 Two (2) weeks before substantial completion, submit to Departmental Representative operating and maintenance manuals for review.
- .2 Final operating and maintenance manuals to be submitted following final inspection.

.3 Furnish evidence, if requested, for type, source and quality of products provided.

.4 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.

.5 Pay costs of transportation.

1.2 PROJECT RECORD DOCUMENTS

.1 At project completion, Contractor to supply Departmental Representative:

- .1 Warranties, guarantees
- .2 Copies of approvals and certificates
- .3 All shop approved shop drawings
- .4 All site instructions
- .5 All change orders
- .6 All field reports by the Departmental Representative
- .7 All inspection/test reports

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

.3 Submit all record photographs taken during the project:

- .1 Include all pre-construction survey photos and weekly record photos as indicated in Section 01 33 00 – Submittal Procedures.
- .2 Organize photos by phase of work and then by week
- .3 Submit on solid-state drive, labelled with project name and number

.4 As-built record drawings to include:

- .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.

1.3 MATERIALS AND FINISHES

.1 Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations.

.2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.3 Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional Requirements: as specified in individual specifications sections.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.

.2 Store in original and undamaged condition with manufacturer's seal and labels intact.

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

.4 Store paints and freezable materials in a heated and ventilated room.

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

1.5 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.

.1 Refer to Section 07 03 32 – Shingles and Shakes Roofing for warranty requirements.

.2 Develop warranty management plan to contain information relevant to Warranties.

.3 Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.

.4 Submit, warranty information made available during construction phase, to the Departmental Representative for approval prior to each monthly pay estimate.

.5 Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:

.1 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

.2 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

1.6 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all Subcontractors shall conduct an inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.

.1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.

.2 Request Departmental Representative's Inspection.

.2 Departmental Representative's Inspection: Departmental Representative 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 Departmental Representative, and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

Part 2 Products

2.1 NOT USED

Part 3 Execution

3.1 NOT USED

END OF SECTION

1. GENERAL

1.1 SUMMARY

.1 Comply with Division 1, General Requirements.

1.2 REFERENCES

.1 Comply with the latest edition of the following statutes codes and standards and all amendments thereto.

.2 CSA S350-M Code of Practice for Safety in Demolition of Structures.

.3 NFPA 241 Safeguarding Building Construction and Demolition Operations.

1.3 SUBMITTALS

.1 Submit cleaning operation schedule.

.2 Submit shop drawings for any bracing and shoring required, signed and sealed by a Professional Engineer registered in Alberta.

.3 Submit for review proposed method of substrate preparation.

2. PRODUCTS

.1 Not used.

3. EXECUTION

3.1 PREPARATION

.1 Disconnect electrical and mechanical systems in areas of selective demolition to rules and regulations of authorities having jurisdiction.

.2 Post warning signs on equipment, which will remain in operation in areas of selective demolition.

.3 Disconnect and cap mechanical services in accordance with requirements of local authority having jurisdiction or pay for having this work done by local authority.

.4 Do not disrupt active or energized utilities in area of selective demolition.

3.2 DEMOLITION

.1 Do work in accordance with CSA-S350.

.2 Work of this Section is of selective nature. The work includes but not necessarily limited to removal and dismantling of:

.1 Demolition of existing roofing assembly completely down to wood deck, where and as indicated.

.2 Remove and discard all counter flashings as indicated.

.3 Demolish in manner to minimize dusting. Keep dusty materials wetted

3.3 EXISTING CONDITIONS

.1 Take over existing structure, with selective demolition work based on existing condition at time of examination prior to bidding. Carefully examine existing structure, equipment and conditions.

.2 Protect existing, minimize damage to existing; make good damage.

.3 Using qualified tradesmen, make good existing finishes disturbed or otherwise damaged during selective demolition. Match existing materials and finishes.

.4 Make good existing materials and finishes disturbed or otherwise damaged by alterations to mechanical and electrical equipment and piping. Match existing materials and finishes.

3.4 PROTECTION

.1 Prevent movement, settlement, or damage of existing structure and adjacent structures, walks, paving and parts of existing building to remain in service.

.2 Engineer and design bracing and shoring as required. Submit approval by a structural engineer licensed in Alberta for demolition methods and procedures.

.3 Prevent debris from collecting and blocking the mechanical and electrical systems which will remain in operation.

.4 Prevent dust from entering mechanical and electrical system by providing temporary enclosures, covers for openings or other means of protection.

.5 Protect interior of parts and items, which are not to be demolished, from exterior elements at all times.

.6 Maintain water and airtight enclosures.

.7 Provide thermal barrier to meet existing exterior thermal barrier.

.8 Protect building service lines from damage.

3.5 CLEANING

.1 After selective demolition clean existing substrates to sound, clean surface free from extraneous matter. Use only non-ionic surfactants.

3.6 DISPOSAL OF WASTE

.1 Dispose waste off site at location acceptable to authorities having jurisdiction.

.2 Remove waste from site daily. Do not store on site.

.3 Do not use waste as fill.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 – Submittal Procedures.

.2 Section 01 41 00 - Regulatory Requirements.

1.2 REFERENCES

.1 Definitions:

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

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

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

.2 Reference Standards:

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

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

.2 Department of Justice Canada (Jus)

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

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

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

.1 Material Safety Data Sheets (MSDS).

.4 National Research Council Canada Institute for Research in Construction (NRC-IRC)

.1 National Fire Code of Canada-2010.

1.3 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 41 00 Regulatory 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 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.4 Storage and Handling Requirements:

.1 Co-ordinate storage of hazardous materials with Departmental Representative and abide by internal requirements for labelling and storage of materials and wastes.

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

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

.4 Keep no more than 45 litres of flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use.

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

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

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

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

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

.8 Observe smoking regulations, smoking is prohibited in areas where hazardous materials are stored, used, or handled.

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

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

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

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

.4 Segregate incompatible materials and wastes.

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

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

.7 Maintain clear egress from storage area.

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

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

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

.11 When hazardous waste is generated on site:

.1 Co-ordinate transportation and disposal with Departmental Representative.

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

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

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

.5 Label container[s] with legible, visible safety marks as prescribed by federal and provincial regulations.

.6 Only trained personnel handle, offer for transport, or transport dangerous goods.

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

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

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

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

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

Part 2 Products

2.1 MATERIALS

.1 Description:

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

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

Part 3 Execution

3.1 CLEANING

.1 Refer to Section 01 74 11 – Cleaning.

.2 Progress Cleaning:

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

.3 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

END OF SECTION

Part 1 General

1.1 SUMMARY

.1 Comply with requirements of this Section when performing following Work:

.1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap on painted elements at exterior perimeter walls.

.2 Removal of lead-containing coatings or materials using a power tool with an effective dust collection system equipped with a HEPA filter on painted elements at exterior perimeter walls.

.3 Removal of lead-containing coatings or materials with non-powered hand tool, other than manual scraping and sanding on painted elements at exterior perimeter walls.

1.2 RELATED SECTIONS

.1 Section 01 35 29.06 – Health and Safety Requirements

1.3 REFERENCES

.1 Department of Justice Canada

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

.2 Health Canada

.1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).

.3 Human Resources and Social Development Canada (HRSDC)

.1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.

.4 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

.5 U.S. Environmental Protection Agency (EPA)

.1 EPA 747-R-95-007-1995, Sampling House Dust for Lead.

.6 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)

.1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).

.7 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances

.1 Lead in Construction Regulation - 29 CFR 1926.62-[1993].

.8 Underwriters' Laboratories of Canada (ULC)

1.4 DEFINITIONS

.1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.

.2 Authorized Visitors: Departmental Representative, Consultant or designated representatives.

.3 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.

.4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.

.5 Action level: employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/m^3) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic meter of air for removal of lead based paint by methods noted in paragraph 1.1.

.6 Competent person: Departmental Representative Engineer, Abatement Engineer capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.

.7 Lead dust: wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.5 SUBMITTALS

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

.2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction. Review and reference Appendix C – Lead in Paint Bulk Sampling.

.3 Provide proof of Contractor's General and Environmental Liability Insurance.

.4 Quality Control:

.1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that lead based paint waste has been received and properly disposed.

.2 Provide proof satisfactory to Departmental Representative employees have had instruction on hazards of lead exposure, respirator use, dress, and aspects of work procedures and protective measures.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.

.2 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.2 Safety Requirements: worker and visitor protection.

.1 Protective equipment and clothing to be worn by workers and visitors in work Area include:

.2 Eating, drinking, chewing, and smoking are not permitted in work area.

.3 Ensure workers wash hands and face when leaving work area. Ensure workers wash hands and face when leaving work area. Facilities for washing are located shall be provided by Contractor. Portable facilities may be required to be provided.

.4 Visitor Protection:

.1 Provide approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.2 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 6ml bags or leak proof drums. Label containers with appropriate warning labels.

.3 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING CONDITIONS

.1 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 SCHEDULING

.1 Not later than two days before beginning Work on this Project notify following in writing:

.1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.

.2 Provincial Ministry of Labour.

.3 Disposal Authority.

.2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.

.3 Provide Departmental Representative copy of notifications prior to start of Work.

1.10 OWNER'S INSTRUCTIONS

.1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.

.2 Instruction and training related to respirators includes, at minimum:

.1 Proper fitting of equipment.

.2 Inspection and maintenance of equipment.

.3 Disinfecting of equipment.

.4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

.4 Supervisory personnel to complete required training.

Part 2 Products

2.1 MATERIALS

.1 Polyethylene 0.15mm thick unless otherwise specified; in sheet size to minimize joints.

.2 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.

.3 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual lead paint residue.

.4 Lead waste containers: metal type acceptable to dump operator with tightly fitting covers and 0.15mm thickness sealable polyethylene liners.

.1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

Part 3 Execution

3.1 SUPERVISION

.1 One Supervisor for every ten workers is required.

.2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

3.2 PREPARATION

.1 Remove and store items to be salvaged or reused.

.1 Protect and wrap items and transport and store in area specified by Departmental Representative.

.2 Work Area:

.1 Shut off and isolate HVAC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.

.2 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.

.3 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise dust.

.4 Seal off openings with polyethylene sheeting and seal with tape.

.5 Protect floor surfaces covered from wall to wall with polyethylene sheets.

.6 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.

.7 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized for application of water as required.

.8 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.

.3 Do not start work until:

.1 Arrangements have been made for disposal of waste.

.2 Tools, equipment, and materials waste containers are on site.

.3 Arrangements have been made for building security.

.4 Notifications have been completed and preparatory steps have been taken.

3.3 LEAD ABATEMENT

.1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal equipped with HEPA filters; or removal with using power tools non-powered hand tool, other than manual scraping and sanding.

.2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15mm plastic bags and place in labelled containers for transport.

.3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.

.4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Do not disturb work area for 8 hours no entry, activity, ventilation, or disturbance during this period.

3.4 INSPECTION

.1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.

.2 Departmental Representative will inspect work for:

.1 Adherence to specific procedures and materials.

.2 Final cleanliness and completion.

.3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 LEAD SURFACE SAMPLING - WORK AREAS

.1 Final lead surface sampling to be conducted as follows:

.1 After work area has passed a visual inspection for cleanliness approved and accepted by Departmental Representative. Apply coat of lock-down agent to surfaces within enclosure, and appropriate setting period of 8 hours has passed, Departmental Representative will perform lead wipe sampling.

.1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.

.2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.

.3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

.1 Following cleaning and when lead wipe surfaces sampling are below acceptable concentrations, proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.

.3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.

.4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

3.7 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

.1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Localized concrete patch repair along cracked and spalled concrete along east elevation stairs.

.2 Installation of new handrail, embedded in concrete stairs along east and north elevation. Engineered shop drawings required.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide lump sum cost to complete all concrete repair work as identified on the drawings. The total cost shall include all costs necessary to complete the repair work, as well as install the new handrails, including engineered shop drawings, and all required materials and labour.

.1 Lump Sum Item 5.0 – Concrete Repairs

1.3 REFERENCES

.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-[15], Standard Specification for Chemical Admixtures for Concrete.

.4 ASTM D1751-[2013e1], Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).

.2 CSA International

.1 CSA A23.1/A23.2-09 (R2014), Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.

.2 CSA A283-06(R2011), Qualification Code for Concrete Testing Laboratories.

.3 CSA S-807-10, Specification for fibre-reinforced polymers.

.4 CSA A3000-13, Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.4 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 00 10 – General Instructions.

.2 Product Data.

.1 Technical Data Sheets: submit minimum one (1) week prior to beginning Work.

.3 At least 2 weeks prior to commencing work, inform Departmental Representative of proposed source of aggregates and provide sampling.

.4 Prepare and submit additional samples as required by Departmental Representative, at no additional cost to Departmental Representative.

.5 Record Photographs:

.1 As work progresses, maintain accurate photo record including daily photographs of preparatory work and stages of repairs.

.2 Submit electronic copies of photographs weekly.

.6 Minimum 2 weeks prior to starting concrete work submit to Departmental Representative manufacturer's test data and certification by qualified independent inspection and testing laboratory that following materials will meet specified requirements:

.1 Portland cement.

.2 Supplementary cementing materials.

.3 Admixtures.

.4 Aggregates.

.5 Water.

.7 Provide certification that mix proportions selected will produce concrete of quality, yield and strength as specified in concrete mixes, and will comply with CAN/CSA-A23.1.

1.5 SHOP DRAWINGS

.1 Submit shop drawings including fabrication and erection documents and materials list in accordance with Section 01 33 00 - Submittal Procedures.

.2 Ensure Fabricator drawings showing designed assemblies, components and connections are stamped and signed by qualified professional engineer licensed in the province of Alberta, Canada.

Part 2 Products

2.1 DESIGN CRITERIA

.1 Concrete repair products: to CSA A23.1-14 / A23.3-14

.1 Formulated for localized repairs.

.2 Compatible with existing concrete structure.

2.2 MATERIALS

.1 Portland cement: to CAN/CSA-A5, Type GU

.2 Supplementary cementing materials: to CAN/CSA-A23.5.

.3 Water: to CAN/CSA-A23.1-04/A23.2-04.

.4 Aggregates: to CAN/CSA-A23.1-04/A23.2-04. Chemical admixtures: to ASTM C 494. Departmental Representative to approve accelerating or set retarding admixtures during cold and hot weather placing.

.5 Stainless steel threaded rods: to ASTM F593

2.3 PERFORMANCE CRITERIA

.1 For duration of warranty periods the following performance criteria apply to the concrete repairs:

.1 Repair does not de-bond from existing substrate.

.2 Repair does not develop shrinkage cracking within the repair patch.

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 Intended application: Concrete stairs

.2 Durability and class of exposure: C2

.3 Compressive strength at 28 days: 32 MPa minimum.

.4 Aggregate size 10 mm maximum

.5 Provide quality management plan to ensure verification of concrete quality to specified performance.

.6 Concrete supplier's certification: both batch plant and materials meet CSA A23.1 requirements.

.7 Other special requirements: Finish slab surfaces with light broom finish

Part 3 EXECUTION

3.1 VERIFICATION OF CONDITIONS

.1 Verify existing conditions are as indicated on Contract Drawings.

.2 Notify Departmental Representative of conditions not indicated on Contract Drawings

3.2 SURFACE PREPARATION

.1 Clean concrete surfaces.

.1 Remove dirt, debris, loose concrete, existing coatings and stains.

.2 Clean concrete surfaces using soap and water and wire brush.

.2 Avoid damaging adjacent surfaces.

.3 Chemical cleaning is not permitted.

3.3 CONCRETE PATCH REPAIR

.1 Sawcut perimeter of repair areas to a depth of 20 mm where specified on drawings.

.2 Chip-out spalled, cracked, delaminated and debonded concrete within the confines of saw-cut perimeter down to sound material.

.1 Leave base surface roughened to increase bond with new concrete

.2 Chip-out concrete to fully expose corroded steel reinforcement on all sides and until 20 mm of un-corroded steel reinforcement is exposed on each end.

.3 Clean corroded steel reinforcements in-situ with metal wire brush.

.1 Review cleaned reinforcement with Departmental Representative.

.2 Upon approval from the Departmental Representative, paint reinforcement with cold galvanizing compound.

.4 Wash down exposed surfaces with pressurized water jet and air hose.

.5 Place bond coat on concrete repair area

.1 Brush cement slurry bonding agent onto cleaned concrete surface. Completely cover surfaces of exposed reinforcing.

.6 While cement slurry bonding agent is still tacky:

.1 Fill repair area with concrete repair mix

.2 Fill area in individual lifts to suit depth and profile of repair area.

.7 Apply brush texture finish.

.8 Wet cure repair areas:

.1 Wet cure period: seven (7) days.

.2 Cover repaired surfaces of concrete with single layer of clean, pre-soaked burlap. Cover only as soon as surface will not be marred by covering.

.3 Keep fabric wet with soaker hoses.

.4 Keep curing system in place for specified time period.

.9 Keep work areas clean and protect exposed concrete and steel from water.

3.4 METAL HANRAIL

.1 Remove and cut existing handrail along base of handrail.

.1 Where corrosion is severe on existing handrail, replace corroded section with new section shop welded and ground smooth.

.2 Clean existing handrails and repaint to match existing. Obtain Departmental Representative approval of final paint color.

.2 Core out entire embedded portion of the existing handrail into the concrete steps.

.1 Diameter of core not to exceed 20 mm more than the existing diameter of embedded handrail.

.3 Install new stainless steel insert into core and set in epoxy resin.

.1 Engineered shop drawings are required for new connection between existing handrails and concrete steps.

.2 New stainless steel insert is to be designed to fit tightly to the interior diameter of the existing handrail.

.3 New concrete embedment depth of insert is to be designed to resist pull-out, edge break-out, and bending.

.4 Install existing handrail

.1 Slot existing handrail overtop of new stainless steel insert.

.2 Leave a minimum 30 mm gap between existing handrail and top of concrete step. Height of handrail to match height prior to repair work.

.3 Install a tamper-resistant through-bolt connection between the existing handrail and the new stainless steel insert, complete with washer and locking nut.

.4 Through-bolt to be installed in line with the handrail (turned in and perpendicular to steps).

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Cleaning of all masonry surfaces in contract area, to remove surface soiling, efflorescence deposits, and biological growth without damaging the surface of the stone either physically or chemically.

.2 Establishing the acceptance standard will be done through a series of mock-ups.

.3 Utilize low pressure hot water and surfactants. Manually scrub with nylon bristle brushes. Complete a test panel for review and approval by the Departmental Representative.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide unit rates for all masonry cleaning work as identified on the drawings, including for all costs necessary to complete the work, including all materials and labour.

.1 Unit Rate Item 1.0 – Masonry Cleaning

.2 Estimated quantities of work have been determined based on observable conditions through an at-grade site survey. Actual quantities at each location may vary. Notify the Departmental Representative where on-site conditions may require additional work beyond the total estimated quantities and require modification of contract documents before proceeding with additional work.

1.3 PERFORMANCE REQUIREMENTS

.1 Perform specific cleaning of the masonry surfaces according to the degree and type of dirt as described in the contract.

.2 Clean all masonry to level of appearance comparable with area designated by Departmental Representative as adjusted at time of specified mock- ups. The intention is not to restore the original appearance.

.3 Clean the stones to remove stains and soiling without damaging the stone surface.

1.4 MOCK-UPS

.1 General:

.1 Do mock-up tests in accordance with Section 01 45 00 - Quality Control.

.2 Mock-ups are necessary to confirm that the equipment and its detailing conforms to the requirements of the Specification, as well as providing the opportunity to determine the levels of clean required and to ensure no damage to the stone.

.3 Notify Departmental Representative 2 weeks before commencing cleaning of each test patch. Obtain approval from Departmental Representative before commencing test.

.4 Mock up locations:

.1 2 locations of sandstone capstone of 1 metre length.

.2 2 locations of rundle masonry of 1 metre square.

.3 1 location of concrete – corrosion staining.

1.5 AMBIENT CONDITIONS

.1 Do not use wet cleaning methods when there is threat of frost.

.2 Provide shading to wall to avoid cleaning in full, hot sunlight.

.3 Collect and dispose of used cleaning materials and products which accumulate in the area of the Work. Prevent run off and absorption of water, chemicals or abrasives into masonry or soil below the cleaning area.

.4 Collection and disposal system to be to the approval of the Departmental Representative.

.5 Comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous material; and regarding labelling and the provision of Material Safety Data Sheets.

.6 Provide protection (dust, rain, and other elements) of the masonry and stone units after wet cleaning.

1.6 WORK SEQUENCE

.1 Submit a work schedule indicating proposed timing and extent of work.

.2 Complete work within approved schedule time. Do not change Schedule without the written approval of the Departmental Representative.

.3 Co-ordinate the cleaning work schedule with other work on site.

.4 Perform cleaning following completion of stone repair interventions, and mortar repointing work. Sequence subsequent applications to the approval of the Departmental Representative.

.5 Perform general wash down using pressure equipment and nylon bristle brushes as needed at end of construction once all repairs, repointing, and abrasive cleaning is completed. The aim is to remove all dust and staining associated with construction phase work to the walls.

.6 Allow the period of curing specified in the applicable sections prior to all cleaning operations.

.7 Ensure that the pH is neutral in the stones within the recessed areas following the post chemical water wash. Contractor to submit a methodology to verify a neutral pH to the

.8 Departmental Representative for approval prior the commencement of the work.

1.7 PROTECTION

.1 All windows, doors and wall openings are to be sealed to prevent the entry of water, dust or chemicals into the building.

.2 Protect all adjacent areas and adjoining materials against damage, including (but not limited to) glass breakage, damage to wooden trim, roof damage by either solvent action or puncture, staining of interior walls, or corrosion of metal trim.

Part 2 Products

2.1 MATERIALS

.1 Water: clean potable water free from contaminants. Treat water having high metal or soluble mineral content before use in cleaning.

.2 Air: free from oil or other contaminants.

.3 Surfactant (detergent): non-ionic, type suitable for use on masonry.

.1 Acceptable product: Triton X100 or alternative as approved by Departmental Representative.

.4 Solvents: toluene, xylene, acetone, methyl ethyl ketone.

.5 Biologic growth cleaner:

.1 Acceptable Product: D/2 Biologic Solution or alternative as approved by Departmental Representative.

.6 Paint Strippers:

.1 Gel form, with active ingredient Methylene Dichloride

.2 Acceptable product: Peel Away or alternative as approved by Departmental Representative.

.7 Ethylene diamine tetra-acetic acid (EDTA) formulated for use as a ferric oxide (rust) removal agent.

2.2 TOOLS AND EQUIPMENT

.1 All brushes shall be of the natural bristle or soft plastic type. Metal brushes are abrasive and are not to be used for cleaning operations.

.2 Scrapers shall be made of wood or plastic only. Metal scrapers shall not be used.

.3 Vacuum Cleaner designed for industrial use, HEPA filter type.

.4 4ml polyethylene sheeting.

.5 Use nozzles that give nebulized droplet spray and provides less than 350 kPa water pressure, measured at nozzle tip of hose. Use nozzles with 12 mm opening.

.6 White Buckets: plastic buckets of small, medium and large sizes.

Part 3 Execution

3.0 SITE VERIFICATION OF CONDITIONS

.1 Report to Departmental Representative conditions of deteriorated masonry or pointing not noted on Contract Drawings found before and during cleaning.

.2 Obtain written approval of Departmental Representative before cleaning areas of deteriorated masonry.

3.1 PREPARATION

.1 Place safety devices and signs near work areas as indicated and directed.

.2 Seal or repair openings and joints where there is potential risk of water/chemical infiltration.

.3 Cover surfaces not to be cleaned.

.4 Dry brush or scrape accumulations from walls, ledges and cornices.

.5 Cover and protect surfaces and non-masonry finishes in areas to be cleaned.

3.2 PROTECTION

.1 Mask or seal vents, windows, and other openings, to prevent water entry or entry of air contaminated with chemical fumes.

.2 Mask materials, including wood, glass and metal, adjacent to treatment areas.

.3 Ensure workers wear eye, head, and face protection, and protective gloves, coveralls, boots and filter mask.

.4 Protect rainwater leaders, eaves troughs and gutters from being blocked by residue.

.5 Protect adjacent Work from spread of dust and dirt beyond work areas.

.6 Protect operatives and other site personnel from hazards.

.7 Maintain protection and heating after wet cleaning for a period of 10 days to allow the stone to dry sufficiently before being exposed.

3.3 MASONRY CLEANING

.1 The overall intent of masonry cleaning is to clean only as necessary without damaging the stones in order to halt deterioration.

.2 Obtain Departmental Representative approval prior to using other cleaning methods for persistent stains.

.3 Ensure finish pointing mortar is sufficiently cured prior to final cleaning. Any mortar joints damaged during final cleaning must be raked out, and re-pointed at no additional cost to the project.

.4 Dry brush with stiff bristle brush all surfaces to remove accumulated loose dirt, suctioning the dirt with a vacuum as it loosens.

.5 Provide protection, troughs and all installations necessary to ensure cleaning solution does not spill, drip or in any other way make contact with adjacent wall or floor surfaces not included in this intervention.

.6 Liberally wet the surface of the soiled stones with the surfactant and warm water solution, temperature 37$_{o}$C to 43$_{o}$C. Concentrations of the surfactant and water solution will be determined by the Departmental Representative.

.7 Brush aggressively by hand using a stiff bristle brush. Brushes must be of various shapes and sizes to allow easy and certain contact with all shaped surfaces of the stones being cleaned.

.1 Accepted level of cleaning will be determined through a period of mock-ups and follow approval from the Departmental Representative.

.8 Discard surfactant solution as soon as it becomes dirty and replace with fresh solution.

.9 Once surface is clean and to the satisfaction of the Departmental Representative, rinse the surface of the cleaned stones by applying liberally with hot water keeping certain to collect all spillage of the rinse water.

.10 Any damage of adjacent wall surfaces such as mortars, glass, plaster, wood, will be replaced or repaired to the Departmental Representative's satisfaction at the expense of the Contractor.

3.4 CLEAN-UP

.1 Rinse off masonry to the satisfaction of the Departmental Representative.

.2 Rinse from bottom to top and from top to bottom.

.3 Collect and dispose of cleaning materials and cleanup work area as work progresses.

.4 Upon completion, clean and restore areas used for work to condition at least equal to that previously existing.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Raking out deteriorated mortar joints and repointing to match existing in color and finish; mortar with deep recessed, concave joint for the exterior facades, and flush jointing for the capstones.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide Unit Rate costs to complete all masonry raking and repointing work as identified on the drawings. Unit Rate costs shall include all costs necessary to complete the raking out and repointing work, including all required materials and labour.

.1 Unit Rate Item 2.0 – Masonry Raking out and Repointing

.2 Estimated total quantity of 280 m^2.

.1 Includes for an estimated 260 m^2 of masonry raking out and repointing as identified on the drawings.

.2 Includes for an allowance of 20 m2 of additional masonry raking and repointing. Allowance is to cover additional raking out and repointing work not identified on the drawings

.2 Provide Unit Rate costs to reset loose masonry units. Estimated quantity is to provide for an allowance to reset any loose masonry which may become loose during the raking out process. Unit price shall include all costs necessary, including all required materials and labour, as well as any necessary works required to stabilize adjacent masonry.

.1 Unit Rate Item 3.0 – Masonry Resetting

.3 Provide Unit Rate costs to complete 100% raking and repointing work of brick masonry under all stepped flashing, as identified on the drawings. Unit Rate costs shall include all costs necessary to complete the raking out and repointing work, including all required materials and labour.

.1 Unit Rate Item 4.0 – Brick Raking out and Repointing

.4 Estimated quantities of work have been determined based on observable conditions through an at-grade site survey. Actual quantities at each location may vary. Notify the Departmental Representative where on-site conditions may require additional work beyond the total estimated quantities and require modification of contract documents before proceeding with additional work.

1.3 REFERENCES

.1 Definitions:

.1 Raking: removal of loose/deteriorated mortar to a depth suitable for repointing until sound mortar, and/or 3x joint thickness and/or a specified mm depth mm is reached, but not less than a depth of 30 mm. It is assumed that the outer 30 mm of mortar consists of a very hard cementitious mortar.

.2 Repointing: filling of masonry joints from which mortar is missing, has been raked out or has been omitted, for a depth of 30 mm.

.3 Tooling: finishing of masonry joints using tool to provide final contour.

.4 CSA International

.1 CSA A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test for Concrete.

.2 CSA A179-2014, Mortar and Grout for Unit Masonry.

.3 CAN/CSA A371-2014, Masonry Construction for Buildings.

1.4 QUALITY ASSURANCE

.1 The work is to be completed by pre-qualified masonry contractors. As part of the bid, provide the name(s) of the supervising stone mason, complete with a full résumé of experience and references for work completed on historic masonry structures - minimum three (3) projects.

.2 The work of this section shall be executed under the continuous supervision and direction of the identified supervising stone mason. All work to be done by skilled and experienced tradesmen specializing in the type of work specified.

.3 Obtain approval from Departmental Representative for changes to qualified personnel.

.4 Mock ups:

.1 Construct the following mock-ups over an area of ±1m2.

.1 Raking out of joints on rundle masonry

.2 Raking out of joints on sandstone masonry (capstones and band courses)

.3 Re-pointing of rundle masonry

.4 Re-pointing of sandstone masonry

.2 The panel(s) location to be approved by the Departmental Representative.

.3 The completed panel is to be used as the standard reference for acceptance or rejection of all repointing work on the job.

.4 The test panel should be prepared under the supervision of the Departmental Representative, to ensure that a full understanding of the procedures, techniques and formulations specified is achieved before work commences.

1.5 SAMPLES

.1 Clearly labeled samples of all materials to be used on the job shall be submitted to the Departmental Representative for approval before work starts.

.2 Product Data:

.1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 The approved samples shall become the standard materials used on the job. Substitutions shall not be permitted without written approval from the Departmental Representative.

1.6 STORAGE AND HANDLING OF MATERIALS

.1 Delivery and Acceptance Requirements:

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.2 Store cementitious materials and aggregates in accordance with CSA A23.1.

.3 Keep material dry. Protect from weather, freezing and contamination.

.4 Ensure that manufacturer's labels and seals are intact upon delivery.

.2 Any material that has deteriorated or has been contaminated shall not be incorporated into the work, and must be removed from the site.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 All materials must be kept between 10 degrees Celsius and 25 degrees Celsius for duration of work.

.2 When ambient temperature is below 5 degrees Celsius:

.1 Store mortar materials for immediate use within heated enclosure. Allow mortar materials to reach minimum temperature of 5 degrees C before use.

.2 Heat water to minimum 20 degrees C and maximum 30 degrees C.

.1 At time of use, temperature of mortar to be minimum of 15 degrees C and maximum of 30 degrees C.

.3 Maintain sand temperature between 10 degrees C and 30 degrees.

.4 Do not mix cement/lime with water or with aggregate or with water-aggregate mixtures having higher temperature than 30 degrees C.

.5 Maintain mortar mix temperature between 10 degrees C and 30 degrees C.

.6 No mortar may be placed when the temperature is below 0^{o}C (32^{o}F), or below 4^{o}C (40^{o}F) and falling.

.7 All work must be suspended during frosty weather unless a heated enclosure is provided.

.8 Work should not be done in full sun at temperatures above 27 C^{o} unless shading of the wall is provided and the masonry wall temperature is kept below this point. Burlap sacking and water misting must be provided to control evaporation. High temperatures can cause flash setting of cements and rapid evaporation of water in the mix, leading to lack of development of final strength by the cement.

.9 All newly laid masonry mortar shall be protected against freezing until it is set and dry.

1.8 PROTECTION

.1 All methods of enclosure and protection shall be to the approval of the Departmental Representative.

.2 Newly laid mortar shall be protected from excessive exposure to rain and full sunlight until the surface is thumb-print hardened.

.3 At end of each working day, cover unprotected work with waterproof membrane. Extend membrane to 0.5 m beyond the perimeter of the work area and install securely to prevent finished work from drying out too rapidly.

.4 Protect adjacent finished work against damage which may be caused by on-going work. This includes newly installed metal flashings. Stained flashing will be replaced at Contractor’s cost

.5 Provide and maintain protection for masonry walls at all times when work is suspended to prevent water from entering partially re-pointed masonry.

.6 Protection shall consist of non-staining plastic sheets, tarpaulins or burlap, secured to prevent lifting in high winds.

.7 Provide protection boards to exposed corners and all openings such as doors and windows which may be damaged by construction activities. Maintain protection for the duration of operations. Remove and dispose of protective material as directed by the Departmental Representative.

.8 All drains and scuppers shall be protected against blockage and damage by wastes and residues before work begins. Suitable protection must be installed over drains while maintaining normal water flow at all times.

.9 Provide protection against the spread of dust, debris and water at or beyond the work area by suitable enclosures of sheeting and tarpaulins.

.10 Prevent the entry of dust, debris and water into the building by sealing all openings.

.11 All workmen must be protected from the effects of dust during cutting-out operations. The contractor shall ensure that all workmen wear adequate, approved protective equipment during these operations and as required at other times.

1.9 EXISTING CONDITIONS

.1 The contractor shall report to the Departmental Representative in writing all areas of severely deteriorated masonry revealed during the work, and shall await instruction regarding repair or replacement of masonry units.

.2 Study pointing styles and methods of reproducing them, and submit sample for approval before starting work.

Part 2 Products

2.1 Materials

.1 Use same brands of materials and source of aggregate for entire project

.2 Mortar: to CSA A179

.3 Water: potable and free from contamination.

.4 Cement: to CAN/CSA A3000, white Portland cement, type GU

.5 Lime:

.1 Air-entrained, dolomitic lime, Type "SA" to ASTM C207; Type SA lime contains air entraining agent.

.2 Sand: to CSA A179; Gradation to ASTM C144. Use well graded sand passing 4.75 mm down to 150 micron sieve where joints are greater than 6 mm. Use sand passing 1.18 mm down to 300 micron sieve where 6 mm thick joints or less are indicated.

.3 Sharp, screened and washed pit sand, free of organic material with final grading and color to approval of Departmental representative.

.6 Power Equipment

.1 All raking out is to be completed through hand tools.

.2 Where approved by the Departmental Representative, a power reciprocating masonry saw may be used to provide a relief cut in the centre of the joint – remainder to be removed through hand tools. Acceptable equipment includes: Arbortech AS170.

2.2 Mixes

.1 Mix Formula

.1 A 1:1:6 (cement: lime: sand) is to be used for all masonry repointing.

.2 Vicat Cone Penetration for Stonework: to ASTM C780.

.1 Pointing Mortar: 19-21 mm.

.2 Bedding Mortar: 23-32 mm

.3 Allowable air content for mortar: 8% to 14%

.4 Colouring of Mortars

.1 The overall colour of mortars should come from the aggregate, not the binder. Pigment will be added should the correct coloration not be attainable from the aggregate itself.

.2 A test patty of mortar must be prepared, accurately proportioned to represent the final mix formula and amount of pigment.

.3 The final colour of the patty must be determined only when it is dry. Accelerated drying of the sample can be accomplished by drying the patty in an oven or over a hot-plate.

.4 No more than 10% by volume of pigment shall be added to mortars.

Part 3 Execution

3.1 GENERAL

.1 Perform work in accordance with CAN/CSA A371. Extent of raking out and repointing is as noted on the Drawings.

.2 Use manual raking tool unless otherwise specified, to remove deteriorated mortar and ensure that no masonry units are chipped/altered/damaged by work to remove mortar. Tools for Cutting out must be narrower than the joint.

.3 Tool and compact using jointing tool to force mortar into joint.

.4 Finish joints to follow profile of existing joints, except where specified otherwise.

.5 Use suitable approved jointing tool to form compacted tooled joints, as detailed. Tool length for finish pointing not to exceed 50 mm.

.6 Do not saw cut or rake out mortar joints where ambient temperature is below 5°C in the spring time or 0°C in the fall, as the mortar in the joints may be frozen. Any attempt to remove frozen mortar will result in damage to the masonry. Damaged masonry resulting from removal of frozen mortar must be replaced at Contractor's cost.

3.2 MORTARING

.1 Prepare measuring boxes to ensure accurate proportioning of materials. Each part measure must be based on a 1 litre volume measure (i.e. 1 part will equal 1 litre). Shovel

measurement of materials is not permitted. Boxes should be of such a size that a batch sufficient for one mixer load is measured out.

.2 Maintain separate measuring boxes for each component

.3 Hand-mixing:

.1 Hand mixing must be carried out using high speed, 2500 Rpm drill, with paddle mixer attachment. Mixing to be completed in sufficiently small container so as to allow full contact of the paddle with the mortar during the mixing process, thus ensuring thorough incorporation of ingredients.

.2 Submit masonry tools and container for approval prior to starting pointing work.

.4 The addition of hydraulic cements to lime and aggregate mixes must be done immediately before the use of the mortar.

.5 All mortar must be used within two hours of gauging; do not re-temper mortars after this time has elapsed.

.6 Initially, mortars should be mixed without cement or the addition of water. Careful addition of approximately 75% of the water should produce a mortar that is just wet enough to hang on a trowel. Mix for 3 minutes or until the materials are thoroughly blended.

.7 Cement should be added and mixed for about 3-5 minutes before use.

.8 Incrementally add the remainder of the water to obtain workable consistency for setting units. Avoid too wet a mix which stains the face of the work.

.1 Record amount of water required to reach this consistency and use for subsequent mixes.

.9 All mixing boards and mechanical mixing machines must be cleaned between batches.

.10 Strict control must be exercised so that masons refrain from using too wet a mix. The addition of water does improve workability but does so at the sacrifice of mechanical strength and the increase in final shrinkage. Mortars must be just damp enough to hang on a trowel. Only water lost through evaporation should be replaced at the mortar-board by the mason; a spray bottle of water is used for this purpose.

.11 Follow manufacturer instructions when premixed mortar is used.

.12 Once proportions are determined, careful control during mixing is vital to ensure quality control. A measuring box should be made to hold the specified amount of pigment for each mortar batch.

3.3 RAKING OUT

.1 All cutting-out is to be done by skilled mechanics under the direction of a competent mason experienced in this type of work.

.2 Rake out all joints as noted on drawings and as directed by the Departmental Representative.

.3 Rake unsound joints free of deteriorated and loose mortar, dirt and other undesirable material.

.4 Remove mortar with hammer and chisel, unless otherwise specified. Take great care so as not to damage masonry units adjacent to joints. Cut away from the arrises to prevent spalling of the masonry. The use of power tools is only permitted, as noted.

.1 Permission to use power tools will be based on the Contractor's ability to comply with the conditions noted below (sub-paragraph 5), as observed in the mock-up.

.2 If these requirements are not complied with, the Contractor will be required to remove all mortar by use of hand tools, at no extra cost to the Departmental Representative.

.5 Where the use of power tools is permitted to remove existing mortar, proceed as follows:

.1 All work is to be done under the direct supervision of the foreman.

.2 Grind the centre of the joint only, to a maximum width of half of the joint width. Mortar must remain on each side of the cut. The grinders must not touch the stone.

.3 For vertical joints, and discontinuous horizontal joints, stop sawcut 50 to 75mm from end of joint. Do not sawcut stone.

.4 Notify the Departmental Representative to inspect the grinding, prior to removing the remaining mortar.

.5 Remove the remaining mortar with hand tools.

.6 Clean joints to full depth of deteriorated mortar, but in no case to less than 30 mm. Clean out voids and cavities encountered.

.7 Clean surfaces of joints by compressed air, without damaging texture of exposed joints or masonry units.

.8 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.

.9 Fine joints (less than 6 mm) need not be raked out more than 10mm, in order to reduce the danger of chipping the masonry edges

.10 Leave no standing water.

.11 Damaged stone includes widening of existing joints, nicks, gouges and chipped or scratched surfaces from cutting out tools, resulting from improper workmanship. Stone damaged as a result of careless raking, or saw cutting, shall be replaced at no cost to the Departmental Representative.

.12 If masonry unseats or bond is broken, remove unit, consolidate the back-up masonry, and reset on a full bed of mortar.

3.4 REPOINTING

.1 Immediately before repointing operations commence, the area to be pointed is to be thoroughly flushed with water to remove all dust and to wet the surface well until suction is controlled and the surface stays wet, but with no standing water.

.2 Pointing is to be compacted firmly, built up in layers not exceeding 30 mm in depth, and a minimum 15 mm thick, allowing each layer to set to the point of slight easing under applied thumb pressure before placing next layer. Complete filing joint within the same work period of the same day.

.3 Allow mortar to set so that there is no excess water that will cause run off on stone faces, then tool to match approved mock-up joints. Tool head joints, followed by horizontal joints. Do not overwork the face of the joints. Ensure joints are uniform in appearance. Do not brush joints until they have set to the extent that brushing will not mark the joint surface.

.4 When mortar is thumbprint hard, finish joints with stippling action, using a short stout bristle brush to compact the joint further and produce a textured finish, exposing the aggregate.

.1 Mortar joint finish to match existing.

.5 All masons are to use identical jointing tools.

.7 All excess mortar must be removed from the face of the masonry before it sets, and the jointing neatly finished as specified.

.6 Curing

.1 Moist cure freshly pointed joints by covering with moist burlap enclosure and polyethylene sheeting for minimum of 7 days after finish pointing. Keep wall and burlap misted.

.7 Protection

.1 Protect newly laid mortar from frost, rainfall or rapid drying conditions for 7 days.

3.5 CLEAN UP

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

.2 Remove droppings and splashing using clean sponge and water.

.3 Clean masonry with stiff natural bristle brushes and plain water only if mortar has fully cured.

.4 After final cleaning, notify Departmental Representative to complete a final inspection of the wall.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Localized replacement of brick masonry units, which may be damaged during the course of works.

1.2 PRICE AND PAYMENT PROCEDURES

.1 Provide unit rates for all brick replacements, including for all material and labor costs necessary

.1 Unit Rate Item 9.0 – Brick Replacement

1.3 RELATED REQUIREMENTS

.1 Section 04 03 07 – Historic – Masonry Repointing.

1.4 REFERENCES

.1 Definitions:

.1 Repair: using adhesives to re-bond sections of fractured masonry.

.2 Consolidation: strengthening masonry units to prevent deterioration (spalling).

.3 Descaling: removal of loose portions of masonry (usually spalled area) through appropriate specialized masonry tools or similar device.

.2 Reference Standards:

.1 Canadian Standards Association (CSA) International

.2 CAN/CSA A82-14, Fired Masonry Brick Made from Clay or Shale.

.3 CAN/CSA A371-14, Masonry Construction for Buildings.

.4 CSA A370-14, Connectors for Masonry.

.5 CSA S304-14, Design of Masonry Structures.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation Meeting:

.1 Conduct pre-installation meeting to verify project requirements and procedures, Manufacturer's installation instructions and manufacturer's warranty requirements.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature and data sheets for brick and materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by Professional Engineer registered or licensed in Province of Ontario.

.2 Indicate method of brick removal.

.4 Samples:

.1 Submit samples:

.1 Two of each type of replacement face brick, matching existing as closely as possible in size and aesthetics.

.2 One of each type of masonry reinforcement and tie proposed for use.

.3 As required for testing purposes.

.5 Certificates:

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

.6 Test Reports:

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

.2 Provide compressive strength, density and porosity values for proposed replacement brick.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements:

.1 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.2 Provide weather protection and construction protection in accordance with CSA S304.

.3 Provide weather protection to newly opened sections in assembly.

.4 Protect and store bricks to facilitate their resetting.

.1 Store dismantled masonry units on wood pallets, protected from exposure to water, elements, and potential mechanical damage, fully covered under polyethylene.

.2 Submit storage and identification system to Departmental Representative for review.

.3 Store detached face bricks, back-up bricks and bricks showing evidence of soluble salts on separate pallets.

.5 Place detached bricks on wood surfaces during handling. Prevent contact with metal.

.6 When bricks are lowered to ground, place directly on wooden platform that will be used for transport or storage.

.7 Transport and keep bricks on wooden platforms.

.8 Ensure that sharp edges of bricks do not come into contact with hard objects.

.9 At request of Departmental Representative, turn over any remaining salvaged bricks to Owner at completion of contract.

.3 Packaging Waste Management: remove for recycling in accordance with Waste Management Plan.

1.8 SITE CONDITIONS

.1 Ambient Conditions

.1 Maintain temperature of mortar materials in accordance with Section 04 03 07 - Historic - Masonry Repointing.

.2 Maintain masonry temperature between 5 degrees C and 30 degrees C for duration of the Work.

.2 Protection

.1 Protect masonry and adjacent work from marking and damage. Protect finished faces from mortar droppings with non-staining coverings. Install protective planks to prevent damage to completed work, where necessary.

Part 2 Products

2.1 NEW FACE BRICK

.1 Burned clay brick: to CAN/CSA A82.

.2 Grade: Grade EG - Exterior Grade.

.3 Compressive strength: to match existing.

.4 Size: to match existing.

.5 Colour and texture: to match existing.

.6 Maximum 24 hour cold water absorption: to match existing.

.7 Maximum Saturation Coefficient: to match existing.

2.2 MORTAR

.1 Mortar: in accordance with Section 04 03 07 – Historic – Repointing Masonry

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Check for evidence of repairs, cracks, moisture, soluble salts contamination and other defects not noted on Contract Drawings, and report to Departmental Representative before starting Work.

.2 Stop work and report to Departmental Representative immediately, evidence of hazardous materials.

3.2 PREPARATION

.1 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

3.3 BRICK REPLACEMENT

.1 Carefully rake out mortar joints, following 04 03 07 – Historic – Mortar Repointing to remove damaged brick units.

.2 Remove adhered mortar from surface of adjacent bricks that remain in place.

.3 Co-ordinate bond pattern, coursing height and joint width with existing brickwork in area selected by Departmental Representative.

.4 Mix and blend brick units within each pallet and with other pallets to ensure uniform blend of colour and texture.

.5 Except in cold weather, pre-wet bricks having an initial rate of absorption exceeding 30 g/minute-194 cm_2 to uniform degree of saturation, 3 to 4 hours before laying. Do not lay until surface is dry or damp only, with no standing water.

.6 Clean dust and brick fragments from slot. Before proceeding with Work, inspect cleaned surface with Departmental Representative.

.7 Dampen slot's surfaces before applying mortar.

.8 Apply mortar and lay bricks.

.1 Lay bricks on full beds of mortar.

.2 Ensure a full bed of mortar is applied to the vertical face of the existing brick masonry at the back of the brick to be installed (the collar joint), prior to laying the new brick.

.3 Fill vertical joints buttered and placed full in face and back-up bricks, and at vertical joint between wythes.

.4 Lay bricks and tool joints in one operation, tooling to provide smooth joints.

3.4 REPOINTING:

.1 Do pointing work in accordance with Section 04 03 07 - Historic - Masonry Repointing.

3.5 CLEANING

.1 Clean brick work surfaces after repairs have been completed and mortar has set.

.2 Clean brick surfaces of adhesive or mortar residue resulting from work performed, without damaging bricks or joints.

.3 Inspect finished brickwork with Departmental Representative.

3.6 PROTECTION OF WORK

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.

.1 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.

.2 Cover with waterproof tarps to prevent weather from eroding recently repointed material.

.1 Maintain tarps in place for minimum of 2 weeks after repointing.

.2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.3 Anchor coverings securely in position.

.4 Damp cure:

.1 Provide damp cure for pointing mortars.

.1 Install and maintain wetted burlap protection during the curing process:

.1 Minimum 3 days.

.2 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.

.3 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.5 Protect from drying winds. Pay particular attention at corners of structure.

.6 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:

.1 Minimum 7 days in summer.

.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

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

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Localized repairs of rundle masonry and sandstone units. Repairs include localized Dutchmans, installation of capstone dowels, installation of helical ties in masonry low walls, and the descaling of localized sandstone units.

.2 Acceptable quality of repairs will be determined through an initial period of masonry mock-ups.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide unit rates for all stone repairs as identified on the drawings, including all material and labor costs necessary to complete the specific repair, including any additional shoring and scaffolding, removal and reinstatement of existing stone, all anchorage, and mortaring work necessary to stabilize adjacent masonry.

.1 Lump Sum Item 6.0 – Dutchman Repairs

.2 Unit Rate Item 5.0 – Dutchman Repairs

.3 Unit Rate Item 6.0 – Descaling Sandstone Stone Face

.4 Unit Rate Item 7.0 – Helical Ties

.5 Unit Rate Item 8.0 – Stone Dowels

.6 Unit Rate Item 10.0 – Rundle Stone Replacement

.1 Estimated quantity is to provide for an allowance to replace any rundle masonry units that may become damaged during the course of works.

.2 Estimated quantities of work have been determined based on observable conditions through an at-grade site survey. Actual quantities at each location may vary. Notify the Departmental Representative where on-site conditions may require additional work beyond the total estimated quantities and require modification of contract documents before proceeding with additional work.

1.3 RELATED SECTIONS

.1 Section 01 33 00 – Submittals.

.2 Section 04 03 06 – Cleaning Historic Masonry.

.3 Section 04 03 07 – Repointing Historic Masonry.

1.4 ALTERNATIVES

.1 Obtain Departmental Representative's approval before changing procedures, manufacturer's brands, sources of supply of materials during entire contract.

1.5 REFERENCES

.1 Definitions:

.1 Repair of Stone: mechanical or plastic repair, done to restore original appearance and function of partly deteriorated stones. Repairs include crack repair, Dutchman repair, fracture repairs and descaling.

.2 Adhesive: material used to fasten broken/fractured stone elements by direct application at fracture interface and/or by application to added reinforcing elements such as dowels.

.3 Mortar: material used to re-bed the stone element being repaired and to repoint adjacent mortar joints.

.4 Reference Standards:

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM C144-04, Standard Specification for Aggregate for Masonry Mortar.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-75.1-M88, Tile, Ceramic.

.3 Canadian Standards Association (CSA International)

.1 CAN/CSA-A3000-03 (R2006), Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

.2 CAN/CSA A179-04, Mortar and Grout for Unit Masonry.

1.6 SUBMITTALS

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

.1 Provide Dutchman stone samples.

.2 Provide new replacement brick samples.

.3 Provide adhesive and mortar samples.

.4 Provide dowel and helical ties samples.

.2 Product Data:

.1 Provide manufacturer's printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations. Include:

.1 Application/installation instructions.

.2 Laboratory test reports certifying compliance of products with specification requirements.

.3 Manufacturer's material safety data sheets (MSDS) for safe handling of specified materials and products, in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

.3 Record Documentation:

.1 Provide marked up set of drawings to provide referencing system identifying locations of stone repairs.

.2 Provide photographic record of dismantle and rebuilt stonework.

.4 Submit upon request by Departmental Representative purchase orders, invoices, suppliers test certificates and documents to prove that materials used in contract meet requirements of specification. Allow free access to sources where materials were procured.

1.7 QUALITY ASSURANCE

.1 Mock-ups:

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct 1 mock-up of stonework Dutchman

.3 Construct mock-up $1m^2$ minimum of stonework to be consolidated with helical ties.

.4 Construct 1 mock-up of dowelled cap stone on low-wall

.5 Construct 1 mock-up of dowelled capstone with brick back-up

.6 Allow 48 hours for inspection of mock-up by Departmental Representative proceeding with stone repair work.

.7 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.8 Clean mock-up to demonstrate cleaning operations to Departmental Representative starting cleaning work.

1.8 STORAGE AND HANDLING OF MATERIALS

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Packing, shipping, handling and unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 41 00 Regulatory Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.3 Keep material dry. Protect from weather, freezing and contamination. Store materials in a dry area and supported free of ground.

.4 Identification with grade, batch and production date shown on container or packaging.

.5 Maintain a minimum ambient temperature of 10 degrees C in storage area

1.9 AMBIENT CONDITIONS

.1 Maintain a minimum temperature of 10 degrees C during and 48 hours after repair, throughout thickness of stone.

.2 Allow materials to reach minimum temperature of 10 degrees C prior to use.

.3 Maintain temperature between 21 degrees C and 24 degrees C during repair and 48 hours after, throughout thickness of stone.

.4 Ensure epoxy resin compatible with humidity condition of stone as specified by manufacturer.

.5 Provide temporary enclosures and heating equipment to maintain specified temperatures. Take precautions to avoid overheating masonry.

.6 Refer to manufacturer's instructions for environmental requirements of products.

Part 2 Products

2.1 MATERIALS

.1 Use materials from same manufacturer throughout the Work.

.2 Portland cement: to CAN/CSA-A3000.

.3 Sand: cleaned and graded in accordance to ASTM C144.

.4 Epoxy:

.1 Acceptable Manufacturers:

.1 Akemi Plastics, Inc

.2 Sika Corporaton:

.3 Hilti Corporation

.4 Or approved equal.

.5 Water: clean and free of deleterious materials such as acid, alkali and organic material in accordance to CAN/CSA A179.

.6 Dowels: stainless steel threaded rod, to ASTM A276, Type 304.

.1 Diameter: as noted on Drawings.

.7 New stone:

.1 Similar mechanical, physical and aesthetic properties to existing stone.

.2 To approval of Departmental Representative

.8 Helical Wall Ties: stainless steel helical anchors to Grade 304, sizes as shown on Drawings. Acceptable Manufacturer:

.1 Helifix

.2 Blok-Lok Spira-lok

.3 Thor Helical

.4 Or approved equal.

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Report in writing, to Departmental Representative areas of deteriorated stone not identified in the documents.

.2 Obtain Departmental Representative's approval and instructions for repair and replacement of masonry units before proceeding with repair work.

.3 Stop work in that area and report to Departmental Representative immediately any evidence of hazardous materials.

3.2 PREPARATION

.1 Remove deteriorated portions of stones using low impact removal methods until sound surface is reached.

.2 Temporarily remove and store light fixtures, mounting brackets, conduit, signs and other building accessories to facilitate the restoration work. Reinstall all removed items.

3.3 DUTCHMAN

.1 Remove decayed stone until sound surface is reached. Cut existing stone to achieve a square void in stone as much as possible.

.1 Removal of stone units may cause adjacent units to become loose. Remove and reset.

.2 Carefully remove to ensure no damage to adjacent stone / brick units. Where damage/fracture to masonry units occurs, notify Departmental Representative. Following approval from the Departmental Representative, set new replacement masonry units, without disturbing existing coursing or alignment of existing masonry units.

.2 Select new stone to match surrounding stone of geological type and colour, free from defects and with bedding to match adjacent work.

.3 Cut new stone insert to exactly fit the cut in existing stone.

.1 Allow for thickness of stone adhesive.

.2 Allow for finished surface slightly projecting from existing masonry face.

.4 Cutting tolerance for new stone: Allow 1 mm maximum joint tolerance on all sides, between the new stone segment and the parent stone.

.5 Installation of dowels:

.1 Drill 11 mm diameter holes into both part and new stone. Maintain minimum edge distances as shown on drawings.

.2 Saturate the cavity and stone surface to which the adhesive is to be applied, prior to application of adhesive.

.3 Insert 10mm diameter dowels and apply specified adhesive to holes and interface. Allow to set for 24 hours minimum.

.6 Dampen stone surfaces. Fill dowel holes of new stone slab with specified adhesive. Place new stone Dutchman into position. Secure stone temporarily to allow adhesive to set. Ensure joint between new and existing stone is filled solid and finished to match existing stone face.

.7 Tool new stone Dutchman unit flush with existing masonry face. Resurface new Dutchman insert as required to make patch unobtrusive. Rubbing back marks on existing stone are not permitted.

.8 Repoint with specified mortar. Profile of joints to match existing.

3.4 HELICAL WALL TIES

.1 Install new 8 mm diameter helical wall ties as indicated. Installation as per manufacturer's instructions. Repair mortar joint after installation as per specifications.

.2 Pre-drill hole for anchor. Drill bit diameter to be one size smaller than the tie size. Ensure that the drill bit stops a minimum of 100 mm from the opposite face of the masonry wall.

.3 Helical ties to be installed into masonry wall only through horizontal joints.

.4 Helical ties to be staggered in spacing, and set a maximum distance of 600 mm from the closest helical tie. Precise location and spacing will vary according to the coursing. Temporarily mark the proposed location of the helical ties. Request review from Departmental Representative.

.5 Install anchors after back pointing has been approved by the Departmental Representative.

.6 Do not mark face of stone with the drill. Damage as a result of careless use of the drill will be repaired at the Contractor's expense.

.7 Ensure the head of the anchor will be completely covered by finish pointing mortar through repointing work.

3.5 CAPSTONE DOWELS

.1 Remove displaced sandstone capstones as marked on drawings. Set stone on padded surface, elevated off the ground.

.1 Removal of stone units may cause adjacent units to become loose. Remove and reset.

.2 Carefully remove to ensure no damage to adjacent stone / brick units. Where damage/fracture to masonry units occurs, notify Departmental Representative.

.2 Drill 12 mm diameter holes, 100 mm deep into the masonry wall where dowels to be installed. Dowels to maintain a minimum edge distance of 100 mm from edge of capstone, or from edge of brick/sandstone masonry interface.

.3 Install the 10 mm stainless steel dowel into the holes. Allow to set in epoxy mortar following manufacturer's instructions.

.4 Drill a 75 mm deep, 12 mm diameter hole into the corresponding locations in the sandstone capstone. Care must be taken to ensure precise location is drilled to ensure capstone will fit ontop of dowels – several drilled holes into the capstone to accommodate the position of the dowels due to inaccurate measurements will not be accepted.

.5 Carefully reset the capstone onto the masonry low wall.

3.6 DESCALING / EXFOLIATION

.1 Descale the surface of the stone, by gently rubbing with hand-held carborundum blocks and pluck with small hand-held tools.

.2 Where scaling is shallow (less than 2mm), bevel the edges of retained and firm surface plates to ensure water shedding.

.3 Where scaling is deep (greater than 5mm) notify Departmental Representative for direction, prior to proceeding, as an alternative repair or replacement may be required.

3.7 PROTECTION

.1 Protect surrounding components from damage during work.

.2 Take utmost care not to damage historic fabric. Make good any damage.

Protect finished work from impact damage.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Localized replacement of rundle masonry units, which may be damaged during the course of works

1.2 PRICE AND PAYMENT PROCEDURES

.1 Provide unit rates for all rundle stone unit replacements, including for all material and labor costs necessary

.1 Unit Rate Item 10.0 – Rundle Stone Replacement

1.3 RELATED REQUIREMENTS

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

1.4 REFERENCES

.1 Definitions:

.1 Fabricator: company having sufficient capacity to quarry, cut, and deliver stonework on schedule.

.2 Installer: company or person specializing in commercial stone work with 10 years documented experience. Employ skilled stone masons on site to do necessary field cutting as stones are set.

.2 Reference Standards:

.1 American Society for Testing and Materials (ASTM)

.1 ASTM C97/C97M-15, Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.

.2 ASTM C170/C170M-16, Standard Test Method for Compressive Strength of Dimension Stone.

.3 ASTM C568-15, Standard Specification for Limestone Dimension Stone.

.4 ASTM C616/C616M-15, Specification for Quartz-Based Dimension Stone.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Samples:

.1 Submit samples of replacement stones for approval, prior to purchase of stone.

.2 Submit samples from quarry supplying replacement stone and samples of the existing stone salvaged on site, as follows:

.1 Two samples: representing full range of colour, pattern and inclusions.

.2 One: sized and dressed to match existing stone units.

.3 Five: 150 mm x 100 mm x 50 mm for compressive strength test to ASTM C170.

.4 One: 150 mm x 150 mm x 12 mm for porosity test to ASTM C97.

.5 Select samples from currently worked bed of quarry and accompanied by quarry certification.

.6 Samples should be representative of the full range of colour, visible markings, and finish to be supplied for the entire project. Indicate quarry bed or direction of bedding on samples.

.7 Submit stone samples to the testing laboratory designated by the Departmental Representative, for conformance with applicable ASTM Standards, prior to fabrication.

1.6 QUALITY ASSURANCE

.1 Allow Departmental Representative access to mason's workshop for inspection of current work-in-progress.

.2 Qualifications:

.1 Execute work by personnel experienced in conservation of historic masonry.

.2 Departmental Representative has right to reject masons who do not demonstrate appropriate abilities or experience.

.3 Mock-ups:

.1 Prepare mock-up of stone replacement procedures, to be approved on site by the Departmental Representative.

.2 Allow one week for inspection of mock-up by Departmental Representative, before proceeding with replacement work.

.3 When accepted, mock-up may remain as part of finished work.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver finished stone to site in substantial, purpose made containers, packed to avoid chipping damage or soiling from any means.

.2 Protect and store stones to facilitate their resetting.

.1 Store dismantled masonry units on wood pallets, protected from exposure to water, elements, and potential mechanical damage, fully covered under polyethylene.

.2 Ventilate shelter to keep condensation from forming on internal surfaces.

.3 Ensure contact between stones is avoided by placing protective, non-staining material between and around each stone.

.3 Avoid excessive handling, and protect against chipping, damage, soiling or staining.

.4 Damaged stone, and stone that is repaired prior to reaching site, will be rejected.

.5 Packaging Waste Management: remove for reuse, in accordance with Waste Management plan.

Part 2 Products

2.1 MATERIALS

.1 Obtain new stone from a single quarry source acceptable to Departmental Representative.

.2 Limestone: to ASTM C568, category III - High Density, of uniform colour, texture and strength, free from holes, shakes, cracks or other defects. Colour to match existing stone masonry on weathered side. Colour to be approved by Departmental Representative.

.3 Ensure single quarry source has resources to provide materials of consistent quality and matching existing stone. For compatibility, stone to have similar mechanical and aesthetic properties to the existing stone.

2.2 STONE BEDDING PLANES

.1 Supply stone to be laid on its natural quarry bed, with the following exceptions:

.2 Face bedded stone will be rejected.

2.3 STONE FABRICATION

.1 Cut stone to shape and dimensions obtained from accurate measurements and profiles taken from existing stone, and full to square with joints as indicated.

.2 Cut-in reglets for flashings where indicated.

.3 Cut stones for anchors, cramps, dowels and support systems.

.1 Provide Lewis pin and clamp holes in pieces which cannot be manually lifted.

.2 Do not cut holes in exposed surfaces.

.4 Fabrication of Replacement Stone

.1 Record profile of existing stone.

.2 Cut and carve new stone to match existing profile.

.3 Obtain approval of new carved stone by Departmental Representative, prior to installation.

2.4 FABRICATION TOLERANCES

.1 Fabricate dimension stone to the following tolerances:

.2 Unit Length: plus or minus 1.5 mm.

.3 Unit Height: plus or minus 1.5 mm.

.4 Deviation from Square: plus or minus 1.5 mm, with measurement taken using the longest edge as the base.

.5 Deviation from flat surface on any exposed face: plus or minus 1.0 mm.

2.5 EXISTING STONE

.1 Use hard, sound, and clean existing stone salvaged on site only with Departmental Representative's approval.

2.6 MORTAR

.1 Mortar: in accordance with Section 04 03 07 – Historic – Masonry Repointing.

Part 3 Execution

3.1 SITE VERIFICATION OF CONDITIONS

.1 Report in writing, to Departmental Representative areas of deteriorated masonry not previously identified.

.2 Obtain Departmental Representative's approval and instructions for repair and replacement of masonry units before proceeding with repair work.

.3 Stop work in that area and report to Departmental Representative immediately evidence of hazardous materials.

3.2 PREPARATION

.1 Prevent absorption of ground water and water accumulation on stone. Rest stones in their natural bedding during weathering.

.2 Move and lift stone units using means to prevent damage. Submit stone units dropped or impacted to Departmental Representative for inspection and approval.

.3 Indicate bedding planes of stone units. Duplicate bedding marks on usable pieces of cut stone.

.4 Place safety devices and signs near work area as directed.

.5 Install and remove temporary shoring or other supports as required.

.6 Cover adjacent plant material and fragile surfaces.

3.3 EXISTING STONE REMOVAL

.1 Remove existing deteriorated stone after obtaining approval from Departmental Representative.

.2 Record photographically from all aspects, those areas allocated for dismantling, prior to start of work.

.3 Using elevation drawings, accurately number each stone to be removed, and record its position. Numbering must correspond to the shop drawings.

.4 Where existing stone is to be reset, mark stone on face, before removal, with marking product which can be completely erased when required, or label attached to stone, without damaging masonry unit. Method of marking to the approval of the Departmental Representative.

.5 Use approved methods to loosen stones which will cause no damage either to stones or to other elements of the tower walls.

.6 Do not use circular millstone or saw, pneumatic chisel, steel tools exerting concentrated pressure on edge of stone. Obtain Departmental Representative’s approval for use of power tools before commencing work.

.7 Loosen wet masonry only when temperature is above freezing point.

.8 Remove loose material from deteriorated stones and clean by wet scrubbing with vegetable fibre brush unless otherwise instructed by Departmental Representative. Do not use high pressure water jet.

.9 Place detached stones on wood surfaces during handling. Prevent contact with metal or vegetation.

.10 Clean dust, mortar and stone fragments from slot.

3.4 RAKING JOINTS

.1 Remove mortar in accordance with Section 04 03 07 – Historic – Masonry Repointing.

3.5 RESETTING

.1 Fix dislodged masonry units in correct location with water soaked hardwood wedges.

.2 Insert and compress firm mortar. Allow mortar to set 24 hours. Damp cure required for minimum 7 days before pointing.

.3 Pull out wood wedges when dried and shrunken and fill voids with mortar.

.4 Point to surface in two layers.

3.6 MOVING STONES

.1 Use Lewises to lift stones to working level.

.2 Move stones horizontally in wheelbarrows or on sleds.

.3 Move large stones using nylon belts properly spaced to provide a safe and even bearing for the stone.

.4 Protect edges of stone from damage when hoisting and lifting from position. Use wood shims to isolate units from hoisting belts.

.1 Incorporate only undamaged stone in Work.

3.7 STONE REPLACEMENT

.1 Clean stone by washing with water and natural fibre brush before laying.

.2 Dampen surfaces of slot and apply bedding mortar.

.3 Lay heavy stones and projecting stones after mortar in courses below has hardened sufficiently to support weight.

.4 Prop and anchor projecting stones until wall above is set.

.5 Set large stones on water soaked softwood wedges, to support stone in proper alignment until mortar has set. Remove wedges when dry, do not break off.

.6 Insert and compress firm mortar to within 30mm of pointing surface. Allow mortar to set 24 hours.

.7 Remove mortar dropping from face of stone before mortar is set. Sponge stone free of mortar along joints as work progresses.

.8 Set stones plumb, true, level in full bed of mortar with vertical joints buttered and placed full except where otherwise specified. Completely fill anchor, dowel and lifting holes and voids left by removed edges.

3.8 FILLING JOINTS/POINTING

.1 Fill joints and point: in accordance with Section 04 03 07 - Historic – Masonry Repointing.

3.9 PROTECTION OF WORK

.1 Cover top of completed and partially completed wall, not enclosed or sheltered, with weatherproof coverings at end of each working day.

.1 Drape cover over wall and extend 0.5 m down both sides.

.2 Anchor securely in position.

.3 Prevent finished work from curing too quickly.

.4 Protect from drying winds. Pay particular attention at corners.

.2 Protect adjacent finished work from marking or damage which may be caused by ongoing work.

.3 Provide temporary bracing of masonry work during erection until permanent structure provides adequate bracing.

3.10 CLEANING

.1 Confirm acceptance of mock-up cleaning operations to demonstration from Departmental Representative before starting cleaning work.

.2 Clean stone work surfaces after repairs have been completed and mortar has set.

.3 Clean stone surfaces of adhesive or mortar residue resulting from work performed without damaging stone or joints.

.4 Clear site of debris, surplus material and equipment, leaving work area in clean and safe condition.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 09 03 61 – Repainting Historic Surfaces

1.2 REFERENCES

.1 Comply with applicable requirements of Alberta Building Codes.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)

.1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 2003

.3 Canadian Standards Association (CSA International)

.1 CSA B111-[74(R2003)], Wire Nails, Spikes and Staples.

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

.3 CSA O121-[M89(R2003)], Douglas Fir Plywood.

.4 CAN/CSA O141-[91(R1999)], Softwood Lumber.

.5 CSA O151-[04], Canadian Softwood Plywood.

.6 CSA O153-[M1980(R2003)], Poplar Plywood.

.7 CSA Z760-[94], Life Cycle Assessment.

.4 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.5 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress [1998].

.6 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber [2005].

1.3 SUBMITTALS

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

.2 Shop Drawings Submittals: in accordance with Section 01 33 00 - Submittal Procedures.

.1 Indicate details of construction, profiles, jointing, fastening and other related details.

.2 Indicate materials, thicknesses, finishes and hardware.

.3 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.1 Submit duplicate samples: sample size 300 x 300 mm or 600 mm long unless specified otherwise of wood materials.

1.4 QUALITY ASSURANCE

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

.2 Supply lumber and panel components marked with a recognized, visible grade stamp.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Protect materials against dampness during and after delivery.

.2 Store materials on raised supports. Cover materials with waterproof covering. Provide adequate air circulation and ventilation.

.3 Do not store seasoned materials in wet or damp areas.

Part 2 Products

2.1 LUMBER MATERIAL

.1 Softwood lumber: unless specified otherwise, S4S, moisture content 19% or less in accordance with following standards:

.1 CAN/CSA-O141.
.2 NLGA Standard Grading Rules for Canadian Lumber.
.3 AWMAC premium grade, moisture content as specified.
.4 Forest Stewardship Council (FSC) certified.

.2 Machine stress-rated lumber is acceptable.

.3 Hardwood lumber: moisture content 15 % or less in accordance with following standards:

.1 National Hardwood Lumber Association (NHLA).
.2 AWMAC premium grade, moisture content as specified.
.3 Forest Stewardship Council (FSC) certified.

2.2 ACCESSORIES

.1 Nails, Spikes, Staples and Screws: In accordance with Alberta Building Code, and as follows:

.1 Use hot-dip galvanized finished steel for all exposed exterior work, highly humid interior areas, at pressure-preservative and treated lumber locations.

.2 Bolt, Nut, Washer, Screw and Pin Type Fasteners: Hot-dip galvanized finish to CSA G164-M1981.

.2 Wood screws: type and size to suit application – match existing.

.3 Splines: wood.

.1 Adhesive: recommended by manufacturer.

.1 Adhesives: maximum VOC limit 30

2.3 AUXILIARY MATERIALS

.2 Sheathing Joint Tape: Heat resistant, 75 mm wide self-adhering duct tape.

.3 Asphalt Primer: asphalt modified bitumen with thermoplastic polymers and volatile solvents.

Part 3 Execution

3.1 INSTALLATION

.1 Do finish carpentry to Quality Standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC), except where specified otherwise.

.2 Scribe and cut as required, fit to abutting walls, and surfaces, fit properly into recesses and to accommodate piping, columns, fixtures, outlets, or other projecting, intersecting or penetrating objects.

.3 Form joints to conceal shrinkage.

3.2 CARPENTRY IN CONNECTION WITH RE-ROOFING

.1 Construct new wood curbs at all roof penetrations (e.g. plumbing vent pipe) except internal roof drains. New curbs are to extend to a minimum height of 200mm above the finished level of the new primary roof membrane.

.2 Replace all deteriorated wood blocking with materials of same style, type and dimensions. Install new wood blocking/walls at roof perimeters to ensure a minimum of 100mm in height above the finished level of the new primary roof membrane.

.3 Attach dimensional wood curbs, control joint boxes, blocking, and framing directly to the new steel decks.

3.3 SCHEDULES

.1 Standing and running trim:

.1 Exterior:

.1 Grade: Match existing.

.2 Solid stock: Species to match existing.

END OF SECTION

1. GENERAL

1.1. RELATED WORK SPECIFIED IN OTHER SECTIONS

.1 Summary of Work: Section 01 11 00

.2 Modified Bituminous Roof Membrane: Section 07 52 00

.3 Flashing and Sheet Metal: Section 07 62 00

1.2. REFERENCE DOCUMENTS

.1 Comply with applicable requirements of Alberta Building Codes.

1.3. SOURCE QUALITY CONTROL

.1 Supply lumber graded by an agency certified by Canadian Lumber Standards Administrative Board.

.2 Supply lumber and panel components marked with a recognized, visible grade stamp.

1.4. PRODUCT DELIVERY AND STORAGE

.1 Protect materials from weather upon delivery to job site.

.2 Store materials on raised supports. Cover materials with waterproof covering. Provide adequate air circulation and ventilation.

.3 Do not store seasoned materials in wet or damp areas.

2. PRODUCTS

2.1 LUMBER

.1 Dimension Board Lumber: To CSA 0141-1970 and graded in accordance with National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber, effective 1980-12-01.

.1 Moisture content at time of installation: Maximum 19%.

.2 S2S or S4S for members not receiving finishes.

2.2 FASTENING DEVICES AND HARDWARE

.1 Nails, Spikes, Staples and Screws: In accordance with Alberta Building Code, and as follows:

.1 Use hot-dip galvanized finished steel for all exposed exterior work, highly humid interior areas, at pressure-preservative and treated lumber locations.

.2 Bolt, Nut, Washer, Screw and Pin Type Fasteners: Hot-dip galvanized finish to CSA G164-M1981.

3. EXECUTION

3.1 WOOD FRAME CONSTRUCTION

.1 Comply with the requirements of Alberta Building Codes.

3.2 INSTALLATION OF WOOD DECK MEMBERS

.1 Install members true to line, levels and elevations. Space uniformly.

.2 Construct continuous members from pieces of longest practicable length.

.3 Install spanning members with “crown-edge” up.

.4 Install blocking to facilitate installation of finishing materials, fixtures, specialty items, and trim.

3.3 CARPENTRY IN CONNECTION WITH RE-ROOFING

.1 Construct new wood curbs at all roof penetrations (e.g. plumbing vent pipe) except internal roof drains. New curbs are to extend to a minimum height of 200mm above the finished level of the new primary roof membrane.

.2 Replace all deteriorated wood blocking with materials of same style, type and dimensions. Install new wood blocking/walls at roof perimeters to ensure a minimum of 100mm in height above the finished level of the new primary roof membrane.

.3 Attach dimensional wood curbs, control joint boxes, blocking, and framing directly to the new steel decks.

3.4 SCHEDULE OF DIMENSION LUMBER

.1 Structural Wall Components: Spruce-pine-fir species, No. 2 construction grade, non-preservative treated.

.2 Non-Structural Wood Deck Components: Spruce-pine-fir species, No. 2 construction grade, non-preservative treated.

.3 Canadian Fir Plywood: To CSA 0121-M1978, 19.1 mm thick, sheathing grade.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Complete replacement of all sloped roofs and dormers with 3-ply cedar shakes, new underlayment and a cedar breather layer. Work includes stripping off old shingles and disposing of the material in an approved dumping site, replacing damaged sheathing if needed (assume 10% of all sheathing will require replacement), and the installation of new cedar shakes to match existing, as well as the replacement of fascia and soffit.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide lump sum price for the complete installation of a new 3-ply cedar shake roofing for the entirety of the building, including for the sides of all dormers. The lump sum prices for the cedar shake roofing will include all costs necessary to complete the work, including assumed 10% sheathing replacement, cedar shakes, eave protection, waterproof underlayment, cedar breather underlayment, all copper accessories (flashing, crickets, caps, etc.), zinc strip, connectors, etc., as well as the removal, disposal, and replacement with new of the existing fascia and soffit; lump sum price to include all materials and labour required for the complete replacement of all sloped roofs and dormer.

.1 Lump Sum Price Item 7.0 – Cedar Shake Roof

1.3 RELATED SECTIONS

.1 01 33 00 Submittal Procedures

.2 07 62 00 Sheet Metal, Flashing and Trim

1.4 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

.1 ASTM B370-03, Standard Specification for Copper Sheet and Strip for Building Construction.

.2 CAN/CSA-O325.0-92 (R1998) Construction Sheathing.

.3 Canadian Standards Association (CSA International)

.1 CSA 0118.1-97 Cedar Shakes and Shingles

.2 CSA A123.3-05, Asphalt Saturated Organic Roofing Felt.

.3 CSA B111-1974(R2003), Wire Nails, Spikes and Staples.

.4 RCABC Roofing Practices Manual

.5 National Building Code of Canada - 2015 (NBC)

.6 CGSB 37-GP-52M, “Roofing and Waterproofing Membrane, Sheet Applied”

1.5 SUBMITTALS

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

.2 Provide sample of shakes of finish, profile and pattern specified.

.3 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

1.6 QUALITY ASSURANCE

.1 Mock-ups:

.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.

.2 Construct 1200 x 1200mm panel to display shake pattern.

.3 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with wood shake Work.

.4 Mock-up may be part of finished work.

1.7 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials to job site, handle and store in original packages and containers with manufacturer's seals and labels intact. Manufacturer's name, brand, mass, specification number, and lot number shall be shown on labels.

.2 Storage and Handling Requirements:

.1 Store materials in weatherproof shelters having floors which will protect materials from moisture. Store roll materials on end. Avoid prolonged exposure of light or heat sensitive materials to sunlight. Comply with manufacturer’s recommendations for job-site storage and protection.

.2 Provide a platform to prevent bundles or loose shingles/shakes coming in contact with ground.

.3 Use boards to cover top of pile to keep out rain and prevent over-drying of bundles or loose shingles/shakes in top layer.

.4 Protect installed work and materials.

.5 In the event of materials damage by the elements, improper handling or other causes, such materials will be rejected, and shall be replaced at no extra cost to the project. Remove rejected materials promptly from the site.

1.8 WARRANTY

.1 Review manufacturer installation instructions and immediately notify Departmental Representative of any discrepancies between drawings and manufacturer installation instructions.

.1 Where failure to notify Departmental Representative leads to void warranties due to unknown deviations from manufacturer installation directions, Contractor will be responsible to replace all work at no extra cost.

.2 Workmanship Warranty

.1 5 years.

.3 Cedar Shake Product Warranty

.1 Minimum of 35 years

Part 2 Products

2.1 MATERIALS

.1 Shakes:

.1 Species: Western red cedar shakes to CSA 0118.1
.2 Grade: Premium
.3 Profile: match existing at butt.
.4 Widths: match existing.
.5 Lengths: match existing.
.6 Grain: 100% edge – grain.
.7 Defects: clear, and free from excessive grain sweeps or bad cross-grain.
.8 Preparation: hand-dressed. Match existing.

.2 Eave protection: Water resistant ice and water shield - modified bituminous membrane

.3 Underlayment: A triple layer, spun bonded polypropylene, water resistant, breathable underlayment

.4 Cedar breather: nylon, three-dimensional matrix in roll form

.5 Cedar Shake Under coursing: No. 15 asphalt-saturated felt

.6 Roofing battens:

.1 Nailing strips - SPF, #2, sized to match existing.

.7 Flashing:

.1 Copper sheet: to ASTM B370 to match existing.

.8 Flashing nails: to be of same material as sheet metal to CSA B111, flat head roofing nails of length and thickness suitable for metal flashing application.

.9 Zinc strip

.10 Shingle nails:

.1 Wire nails:

.1 Shingle: to CSA B111, flat head, round shank, diamond point hot-dipped, zinc coated.

.2 Double-coursing: to CSA B111, brad head, dimpled or plain, round-shank, diamond point hot-dipped, zinc coated.

Part 3 Execution

3.1 STRIPPING OFF OF EXISTING FINISHES

.1 Remove existing roof finishes, flashings and underlay, and expose sheathing, and shingle lath, and log purlins, of roof and dormers. Remove existing gutter to facilitate roof and masonry work.

.2 Withdraw existing shingle and flashing nails, setting those nails which break off. Leave surfaces free from dirt and loose material.

.3 Report to Departmental Representative unforeseen deficiencies and deterioration. Repair as directed.

.4 Carefully remove and retain copper ridge cap for reinstallation. Damaged or deteriorated roof cap shall be inventoried, documented and replicated to match existing.

3.2 ROOF DECK AND SIDEWALL PREPARATION

.1 Replace cut out portions of sheathing boards, and lath with boards of equal sectional dimensions, of specified grade.

.1 Solid roof sheathing: lay boards with tight joints.

.2 Tight wall sheathing: fit boards tightly.

.2 Inform Departmental Representative when work is completed and ready for inspection.

3.3 INSTALLATION OF FLASHINGS

.1 Sequence of installation:

.1 Install edge drip flashing before installing roof underlayment.

.2 Install all other flashing (crickets, aprons, valleys, and saddle flashing) overtop of roofing underlayment.

.2 Copper crickets and aprons around chimneys are to be replaced in-kind

.1 Contractor to verify dimensions on-site.

.2 Install copper crickets and aprons on top of roofing underlayment.

.3 Edges of cricket and apron to be covered with cedar shakes.

.3 Valley, saddle, and dormer:

.1 Flashing sheets to extend from centreline of valley, up each side a distance of at least 300 mm.

.2 Valley flashings for open valley to be made shingle fashion, lapped not less than 250 mm.

.3 Valley flashings for open valley to be discontinuous, interwoven with shingle courses and have 150 mm head-lap.

.4 Hip and Ridge:

.1 Existing ridge flashing to be carefully removed and reinstalled following completion of cedar shake installation. Any damage to the ridge flashing will be made good at no additional cost to the project.

.2 Install zinc strip over top of last course of shakes:

.1 Install zinc strip underneath the cap flashing, with 25mm exposed on each side.

.2 Mechanically fasten zinc strip following manufacturer's instructions, but at no less than 600 mm apart.

.3 Re-instate ridge flashing overtop of zinc strip, top course of shakes and upstanding batten. Secure on either side of batten by round headed, brass, wood screws about 300 mm apart.

.4 Install hip over mitred ridge boards raised on wood blocking 1220 mm on centre. Secure on either side by nails, about 300mm on centre driven into outside edges of ridge boards. Flashing to be crimped and turned down over nail heads.

.5 Base:

.1 Flashings:

.1 Minimum height 230 mm.

.2 Minimum projection 200 mm out on roof.

.2 Where base flashing is stepped:

.1 All stepped flashing is to be replaced in-kind

.2 Ensure steps are equal, horizontal width between 230 and 300 mm and vertical height between 2 and 4 courses.

.3 On sloped intersections, ensure sheets are lapped minimum 75mm.

.4 When run horizontally, ensure sheets are flat locked and soldered.

.5 Ensure lock seam joints at vertical corners of chimney.

.6 Cap flashings or counter flashings:

.1 Turn cap flashings down over base flashings to not less than 100 mm of surface of finished roof.

.2 Extend building paper up under exterior coverings such as wood siding and shingles 100 mm above butt of second shingle course.

.3 Reglet: (chimney or wall) cap flashing inserted not less than 100 mm and secured with lead plugs min 25mm wide, 250 mm apart or 19 mm by removing mortar, then filling over flashing with bituminous mastic is turned down over base flashing. Outside edge is turned back on itself at least 13mm.

.4 Provide mock-up for approval by Departmental Representative.

.5 Match existing conditions and tie flashings into previously used mortar joint locations from old flashing locations.

.7 Continuous flashings:

.1 Flashings:

.1 Minimum height: 150 mm.

.2 Minimum projection out on roof: 150 mm

.2 Lap sheets minimum 150 mm and solder only on top.

.8 Gutter linings:

.1 Extend gutter lining 300 mm up under shingle roofing and secure by cleats.

.2 Make gutter linings continuous with joints securely formed and soldered on both sides.

.9 Sidewall junctions:

.1 Provide window caps, dormers and other projections with flashings at points where rain water accumulates or snow piles. Extend flashings up under shakes 150 mm.

.2 Reinforce mitred corners or jointed corners with square strip or moulding have continuous narrow metal flashing strip. Step flash woven inside corners.

3.4 CEDAR SHAKE ROOF APPLICATION

.1 Notify Departmental Representative of any deviations between contract documents and manufacturer's installation procedures.

.2 Ensure the deck is smooth, firm, clean and dried

.3 Eave Protection:

.1 Provide eave protection as specified in NBC - Subsection 9.26.5.

.2 Use a self-sealing composite membrane consisting of modified bituminous coated material, as specified in NVC, Subsection 9.26.5.2; install the ice and water shield as directed by manufacturer's installation procedures and required lap lengths.

.1 Installed to either side of valleys and saddles.

.2 Along the perimeter of junctions with dormers

.3 Application lengths:

.1 915 mm wide strip along eaves

.2 450 mm to either side of valleys and saddles

.3 450 mm to onto main roof, and 450 mm along sidewall of dormers.

.4 Install new polypropylene water resistant membrane over entire roof.

.1 Starting at base of roof, install membrane horizontally across roof.

.2 Fasten at top and bottom of roll within 50 mm of edge 305 mm on centre

.3 Ensure a minimum of 150 mm horizontal and minimum 305 mm vertical laps.

.4 Seal top and sides with Seam Tape

.5 Do not place vertical laps above windows.

.5 Cedar Breather:

.1 Install cedar breather underlayment over top of roof underlayment and over entire roof surface.

.2 Follow manufacturer's installation procedures.

.3 Tack down underlayment with 1 nail approximately every 1 m^2

.4 Work from fascia to ridge

.6 Cedar Shakes:

.1 Install shakes to match existing pattern and maintain a 3-ply coverage.

.2 Starter Course:

.1 Apply a starter course of double layer of shakes along the eave edge, projecting approximately 50 mm beyond fascia board.

.2 Block up starter course sufficient to bring high points of all shingle courses into alignment.

.3 Typical Course:

.1 Install shakes with weather exposure to match existing and having triple thickness of shakes at any given point.

.2 Lay shakes with grain perpendicular to eaves.

.3 Keep shakes 25 mm clear of any vertical flashing.

.4 Spacing:

.1 Space shakes 6 mm to 9 mm apart.

.2 Joints in any one course shall be separated not less than 40 mm from joints in adjacent courses, with no joint lining up within three courses.

.5 Nailing:

.1 Secure each shake with two nails.

.2 For concealed nailing, use 2 nails per shingle per shingle up to 200 mm wide, 3 nails per shingle in excess of 200 mm wide.

.3 Drive each nail, approximately 20 mm from the sides of the shakes and 40 mm above the exposure line. Do not drive nail head into shakes.

.4 Bottom shingles of double starter course to have additional line of nailing 13 mm back from overhang. Spacing to be similar to that of typical roof course.

.5 Provide extra nailing to final course of shingles at ridge, 25 mm plus down from ridge if sawing off, or breaking off of extra shingle length, in situ, is required.

.6 Drive nails flush but do not crush shingles.

.6 Under course:

.1 After each course of shakes is applied, apply under course layer of 450 mm wide strip of asphalt saturated felt before installing next course of shakes. Under course is:

.1 Installed over top portion of shakes

.2 Installed to extend onto sheathing

.3 Installed with bottom edge of asphalt saturated paper positioned above the butt line at a distance equal to double the exposure of the shakes.

.4 Each under course between shakes to be held in place with single 32 mm nail or staple.

.7 Trim shakes parallel with valley, saddles, and dormers to form 160 mm wide gutter. Keep nails away from valley centre.

.8 Roof Hips:

.1 Install cedar flashing

.7 Extra Stock

.1 Excess shakes are to be left for future maintenance use by the Owner.

3.5 CEDAR SHAKE SIDE WALLING

.1 Underlayment:

.1 Cover outside of exterior sheathed walls with new polypropylene water resistant membrane.

.2 Lay underlayment paper in an overlapping shingle fashion without wrinkles or buckles and with joints minimum 150 mm and carried over studs, jambs, heads and sills of openings. Ensure end laps occur within minimum 450 mm of any internal or external corner.

.2 Coursing:

.1 Match existing coursing with 3-ply cedar shakes.

.2 Lowest or beginning course should be doubled and blocked up sufficiently to bring high points of all shingle courses into alignment

.3 Spacing:

.1 Space shakes 6 mm to 9 mm apart.

.2 Joints in any one course shall be separated not less than 40 mm from joints in adjacent courses, with no joint lining up within three courses.

.4 Shakes to be securely fastened using 45 mm small headed rust-resistant or zinc coated nails. These nails are driven about 50 mm above butt line of course above, one nail about 20mm from each edge of shakes, and a third nail in the centre of all shingles wider than 200 mm.

.5 Under course:

.1 After each course of shakes is applied, apply under course layer of 450 mm wide strip of asphalt saturated paper before installing next course of shakes. Under course is:

.1 Installed over top portion of shakes

.2 Installed to extend onto sheathing

.3 Installed with bottom edge of asphalt saturated paper positioned above the butt line at a distance equal to double the exposure of the shakes.

.4 Each under course between shakes to be held in place with single 32 mm nail or staple.

.6 Keep butts of shingles horizontally aligned when changing surfaces.

.3 Extra Stock

.1 Excess shingles are to be left for future maintenance use by the Owner.

3.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling.

.2 Salvage all copper flashing and return to PCA.

END OF SECTION

1 GENERAL

1.1 SCOPE OF WORK

.1 Complete re-roofing of all flat roofs, including the re-sloping of existing roofs and a new 2-ply modified bituminous roofing membrane (MBM roofing membrane). Work includes removing existing flat roofing system and disposing of the material in an approved dumping site, replacing damaged sheathing if needed (assume 10% of all sheathing will require replacement), and the installation of new MBM roofing membrane.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide lump sum price for the complete re- roofing of all MBM flat roofs for the entirety of the building. The lump sum price will include all costs necessary to complete the work including all materials and labour, and the assumed 10% sheathing replacement.

.1 Lump Sum Price Item 8.0 – MBM Roof

1.3 RELATED SECTIONS

.1 01 33 00 Submittal Procedures

.2 07 62 00 Sheet Metal, Flashing and Trim

1.4 REFERENCES

.1 ASTM International Inc.

.1 ASTM C1177/C1177M-06, Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.2 ASTM D41-05, Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

.3 ASTM D312-00(2006), Standard Specification for Asphalt Used in Roofing.

.4 ASTM D6163-00e1, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fibre Reinforcements.

.5 ASTM D6164-05, Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

.6 ASTM C1289 05a, Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.

.7 ASTM E96/E96M 05, Standard Test Methods for Water Vapour Transmission of Materials.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 37-GP-9Ma-83, Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.2 CGSB 37-GP-56M-80b (A1985), Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.3 CAN/CGSB-51.33-M89, Vapour Barrier Sheet, Excluding Polyethylene, for Use in Building Construction.

.3 Alberta Roofing Contractors Association (ARCA)

.1 Roofing Applications Standards Manual 2013.

.4 Canadian Standards Association (CSA International)

.1 CSA A123.21-04, Standard Test Method for the Dynamic Wind Uplift Resistance of Mechanically Attached Membrane-Roofing Systems

.2 CSA-A123.4-04, Asphalt for Constructing Built-Up Roof Coverings and Waterproofing Systems.

.3 CSA A231.1-06, Precast Concrete Paving Slabs.

.4 CSA O151-04, Canadian Softwood Plywood.

.5 Factory Mutual (FM Global)

.1 FM Approvals - Roofing Products.

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

.1 Material Safety Data Sheets (MSDS).

.7 Underwriters Laboratories' of Canada (ULC)

.1 CAN/ULC-S704-03, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.5 ADMINISTRATIVE REQUIREMENTS

.1 Convene pre-installation meeting one week prior to beginning waterproofing Work, with Departmental Representative to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Co-ordination with other building subtrades.

.4 Review manufacturer's installation instructions and warranty requirements.

1.6 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet and include: product characteristics, performance criteria, limitations

.2 Submit one copy of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) for all roof assembly components.

.3 Provide shop drawings:

.1 Indicate tapered insulation details.

.2 Provide layout for tapered insulation.

.3 Description of complete roof system, from the deck up, proposed for use.

.4 Manufacturer's Certificate: certify that products meet or exceed specified requirements.

.5 Submit a letter from the roof membrane manufacturer stating the roofer is approved by the membrane manufacturer to apply roof assembly components.

1.7 QUALITY ASSURANCE

.1 Installer qualifications: company or person specializing in application of modified bituminous roofing systems with minimum five (5) years' experience approved by the membrane manufacturer.

.2 Arrange for the membrane manufacturer's review of preparation for and application of roofing system.

.3 All components used in the roof system shall be furnished by, or approved by, the manufacturer whose roofing system is selected for use.

.4 At least one member of the roofing crew is to be a 'journeyman roofer' and is to be on site at all times.

.5 Pre-Roofing Conference:

.1 Attendees: Conduct pre-roofing conference with Owner, Departmental Representative, Roofer and Contractor.

.2 Arrange a site visit prior to commencement of roofing to review with installer and Departmental Representative, installation procedures to be adopted, conditions under which work will be carried out, and inspect surfaces requiring roofing.

.3 Review weather conditions under which work will be done, substrate conditions, preparation of existing surfaces, applicable procedures and protection of completed work.

.4 Record: Discussions and agreements and furnish copy to each participant and entity invited.

.6 Upon completion of work, roofing system to undergo controlled water test for review and acceptance of Departmental Representative. Water test to ensure water tightness at junctions, and appropriate water flow and drainage.

1.8 FIRE PROTECTION

.1 Fire Extinguishers:

.1 Maintain one cartridge operated type or stored pressure rechargeable type with hose and shut-off nozzle,

.2 ULC labelled for A, B and C class protection.

.3 No open flame allowed on this building.

1.9 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

.2 Storage and Handling Requirements:

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

.2 Provide and maintain dry, off-ground weatherproof storage.

.3 Store rolls of roof membrane in upright position. Store membrane rolls with selvedge edge up.

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

.5 Place protective plywood runways over completed Work to enable movement of material and other traffic.

.6 Store low-rise foam adhesive and sealants at +20 degrees C minimum.

.7 Store insulation protected from weather and deleterious materials.

.8 Protect components against direct sun light, wetting, moisture absorption, mud, dust, sand, oil, grease, dirt and construction traffic.

.9 Avoid excessive stockpiling of components on roof.

1.10 FIELD CONDITIONS

.1 Ambient Conditions

.1 Do not install roofing when temperature is below -10 degrees C, or to manufacturers' recommendations.

.2 Minimum temperature for solvent-based adhesive is 5 degrees C.

.2 Protect adjacent surfaces which are not to be roofed from soiling in connection with the work of this Section.

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

.4 Do not expose insulation longer than recommended by manufacturer.

1.11 WARRANTY

.1 Manufacturer warrants that modified bituminous membrane roofing will stay in place, remain leakproof and be free of any workmanship defects for a period of ten (10) years.

.2 Warranties are to be "no dollar limit" (NDL) and cover all labour, materials, and workmanship for the periods outlined.

.3 Warranties are to commence upon substantial completion of the Work.

.4 Warranty must be transferable, at no extra cost, to subsequent building owners.

2 PRODUCTS

2.1 PERFORMANCE CRITERIA

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

2.2 ACCEPTABLE MANUFACTURER'S SYSTEMS

.1 Manufacturers: All membrane components to be supplied by a single manufacturer where possible. The following manufacturers' materials are acceptable:

.1 SOPREMA or approved equivalent.

.2 Submit complete proposed material list for all new roof membrane assembly components to the Departmental Representative for approval prior to the project start-up meeting.

2.3 DECK LEVELLING BOARD

.1 Deck Levelling Board: 6.4mm Georgia Pacific DensDeck Prime (or approved equivalent), 1220mm x 2440mm (4' x 8'); treated core, ends square cut; edges square, reinforced and treated water repellent faces. Loose-lay new deck levelling board over the existing wood deck. Stagger end joints of the deck levelling board a minimum of 300mm (12").

2.4 PRIMER

.1 Primer:

.1 Description: a primer designed to enhance the adhesion of self-adhesive membranes on porous surfaces at temperatures above -10˚C.

.1 MAMMOUTH Elastocol Stick or approved equivalent.

2.5 MEMBRANE

.1 Field Base Sheet Cover Board

.1 SOPREMA 7mm Soprasmart Board Sanded mechanically fastened with minimum 12 screws and plates per board, or approved equivalent.

.1 Description: Soprasmart Board 180 Sanded is a high performance high density support panel composed of SBS modified bitumen membrane with a non-woven polyester reinforcement, factory-laminated on asphaltic board (SOPRABOARD). The surface is covered with a thermofusible plastic film.

.2 Field SBS Base Sheet Cover board end lap cover strip

.1 SOPREMA Sopralap Stick, or approved equivalent

.1 Description: Sopralap Stick is a cover strip composed of SBS modified bitumen and a composite reinforcement. The surface is sanded. The underface is covered with a release protection film.

3. Base Stripping

.1 SOPREMA's Sopraflash Stick, or approved equivalent

.1 Description: Base sheet membrane composed of SBS modified bitumen with a glass mat reinforcement. The surface is sanded. The self-adhesive underface is covered with a release protection film.

.2 Self-adhered SBS modified bituminous base stripping is to be applied only to new, primed non-treated plywood substrate installed over existing perimeter or penetration substrates.

.3 Field Cap Sheet & Cap Stripping

.1 SOMPREMA Sopralene 250 HR GR, or approved equivalent

.1 Description: Sopralene Stick HR GR is a cap sheet membrane composed of SBS modified bitumen and a composite reinforcement. The surface is protected by coloured granules. The underface is covered with a release protection film.

4. FASTENERS

.1 No. 10 flat head, self tapping, Type A or AB, cadmium plated screws. FM-approved screw and plate assemblies.

5. SEALANTS

.1 TREMCO Dymonic – a high performance, low modulus, one component, moisture-curing, polyurethane joint sealant.

.2 Cleaning Compound: Xylene or trisodium phosphate, as per manufacturer's recommendations.

.3 Primer: As per manufacturer's recommendations.

.4 Colour: As approved by the Owner.

.5 Backer Rod: Softrod, non-gassing, closed-cell or approved equivalent.

.6 All sealants used for roofing will be from the same manufacturer and delivered and stored on site in original containers.

6. LIQUID FLASHINGS

.1 Description: A two-component PMMA resin dedicated to roof waterproofing without flame in new constructions and/or renovations. It is applied with a brush or roller. All applications must be installed with reinforcement fleece and in accordance with manufacturer installation requirements and written recommendations.

.1 SOPREMA ALSAN RS 230, or approved equivalent

3 EXECUTION

3.1 QUALITY OF WORK

.1 Examine and prepare roofing Work in accordance with Roofing Manufacturer's Specification Manual and ARCA Roofing Applications Standards Manual, particularly for fire safety precautions.

.2 Apply primer in accordance with manufacturers written recommendations.

.3 The interface of the walls and roof assemblies will be fitted with durable rigid material plywood providing connection point for continuity of air barrier.

3.2 EXAMINATION OF EXISTING CONDITIONS

.1 Contractor is to ensure that all materials and equipment on the roof are secured to prevent wind blow-off.

.2 Contractor is to coordinate with local fire authorities to create a fire safety plan dealing with hot works on the roof. Contractor is to ensure that plan follows guidelines laid out by local authorities.

.3 Contractor is to follow applicable federal, provincial and local statutes, regulations, and ordinances as required for the transportation of combustible gases.

.4 Verification of Conditions:

.1 Inspect deck conditions including parapets, construction joints, roof drains, plumbing vents and ventilation outlets to determine readiness to proceed.

.5 Evaluation and Assessment:

.1 Prior to beginning of work ensure:

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

.2 Curbs have been built.

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

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

.6 Do not install roofing materials during rain or snowfall.

3.3 PROTECTION OF IN-PLACE CONDITIONS

.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 off roof and away from face of building until roof drains or hoppers installed and connected.

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

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

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

.8 Contractor is to uncover no more roof than can be completed prior to the end of work day or prior to rain or snowfall.

.9 Contractor to ensure that all materials and equipment are prevented from falling or blowing off from the roof during wind events.

.10 Contractor to ensure existing interior building finishes and equipment are protected from rain and melt water intrusion.

3.4 REMOVAL OF EXISTING ROOFING SYSTEM

.1 Remove existing roofing assembly components down to the existing wood decks.

.2 Remove only portions of the roof that can be replaced the same day or prior to inclement weather in order to ensure the roof remains waterproof.

.3 Dispose of all existing roofing materials legally.

.4 Any unexpected conditions encountered during removals are to be reported to the Departmental Representative immediately.

.5 All surplus materials and rubbish become the property of the Contractor.

.6 Do not overload the roof during execution of removals.

.7 Contractor must ensure any new and/or temporary openings made through the existing roof assemblies (e.g. for pipes, curbs, ducts, etc.) are 100% sealed and waterproofed prior to the end of each work day or any inclement weather.

.8 Ensure that all removed materials are secured from wind blow-of during removal operations.

.9 Dispose existing roof assembly components in a controlled manner. Do not drop or throw existing roof assembly components from heights.

.10 Restore areas and existing works outside areas of removals that were damaged, disassembled and /or removed in the progress of the Work to match condition of adjacent, undisturbed areas at no expense to the Owner.

3.5 ROUGH CARPENTRY FOR ROOFING

.1 Carefully remove existing sidings and trim neatly as required to suit new details and in order to install roofing applications.

.2 Remove and discard all existing dimensional wood curbs and plywood sheathing as indicated in the detail drawing. Install new wood blocking and non-treated plywood sheathing at high walls and inside faces of parapet walls, and along the roof surface to achieve required 2% slope. All wood in contact with roofing membranes is to be non-treated.

.3 All membrane penetrations (except roof drains) are to be curbed with wood and/or retrofitted with pre-fabricated metal sleeves. Gum boxes installed directly into the roof membrane are not acceptable and will be rejected.

.4 All new roof penetration curbs are to be set at a minimum height of 200mm (8”) above the finished height of the new primary roof membrane.

.5 All new dimensional lumber and non-treated plywood in contact with existing concrete or masonry is to be treated with a wood preservative.

.6 Abandoned Openings:

.1 At openings larger than 300 mm x 300 mm (12" x 12"), install new decking to match existing size and profile. Decking to overlap existing decking by 150 mm (6") each way. Fasten securely in place with screws that penetrate the deck 25 mm (1").

.2 Repairs to any damaged conduit above or below the deck or other items by the Contractor are to be repaired at the Contractor's expense.

3.6 DECK LEVELING BOARD INSTALLATION

.1 Lay new 12.7mm gypsum deck levelling boards with tightly butted joints running perpendicular to the direction of the existing wood decks. Stagger end joints of the deck leveling board a minimum of 300mm (12"). Loose-lay each 1220mm x 2440mm (4' x 8') gypsum deck levelling board over the existing wood decks.

3.7 ROOF MEMBRANE INSTALLATION

.1 Base Sheet Cover board Installation:

1. Mechanically fasten base sheet cover board using a minimum of 12 screws and plates per board. Target patch all fastener locations with hot-air welded base sheet cover patches prior to installation of new cap sheet.

2. Straight align end laps of the base sheet board. Install primer and self-adhered base sheet cover strips centered on the end laps.

.3 Always seal the lap joints of the base sheet at the end of the workday. Perform the work without interruption to avoid tears and the formation of fish mouths, air pockets, and wrinkles.

.4 Provide a smooth application free of wrinkles, fish mouths, air pockets or tears.

.5 Prior to the application of any cap sheet, Contractor is to seek the Departmental Representative's approval of the base sheet application.

.2 Base Sheet Installation

.1 Apply base sheet flashing only after primer coat is dry.

.2 For sanded base sheet membranes, apply primer for self-adhesive membrane on the area to be covered at the foot of the parapets.

.3 Cut off corners at end laps of areas to be covered by the next roll.

.4 Each selvedge will overlap the previous one along lines provided for this purpose, and by 150 mm (6 in) at the ends.

.5 Position the pre-cut membrane. Remove 150 mm (6 in) of the silicone release film to hold the membrane in place at the top of the parapet.

.6 Then, gradually peel off the remaining silicone release film, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the flashing and the field surface. Smooth the entire membrane surface with a membrane roller for full adhesion.

.7 Install a reinforcing gusset at all inside and outside corners.

.8 Always seal overlaps at the end of the workday.

.9 Avoid the formation of wrinkles, swellings or fishmouths.

.10 Mechanical fixation of the Self-adhesive base stripping membrane is required using Round Top Nails. First row 4" (100mm) above the finished roof level and then every 8" (200mm) up the vertical surface. This procedure will be repeated every 12" (300mm) along the parapet wall or curb location.

.3 Cap Sheet Installation:

.1 Apply self-adhesive membrane primer to the area to be covered.

.2 Starting at drain, Dry unroll the cap sheet membrane on the base sheet, taking care to align the edge of the first selvedge with the edge of the roof.

.3 Cut off corners at end laps at areas to be covered by the next roll.

.4 Each selvedge will overlap the previous one laterally along lines provided for this purpose, and will overlap by 150 mm (6 in) at the ends. Space end laps a minimum of 300 mm (12 in).

.5 Remove the silicone release film, pressing down the membrane using a membrane roller to ensure good adhesion.

.6 Adhere the first 50 mm (2.0 in) of the self-adhesive side laps using a membrane roller, then heat-weld the last 50 mm (2.0 in) (self-adhesive, heat-welded side laps).

.7 Apply Colply Trowel Grade Adhesive for the first 125 mm (5 in) of the end laps using a steel trowel with 5 mm (3/16 in) notches.

.8 Complete the application by welding the last 25 mm (1 in) of the overlap to the field surface, using an electric hot-air welder and a membrane roller.

.9 Repeat these steps to install the other membranes.

.10 Avoid the formation of wrinkles, swellings or fishmouths.

.4 Cap Sheet Stripping/Flashing Installation

.1 This cap sheet must be installed in one-metre-wide strips (3.25 ft).

.2 Each selvedge will overlap the previous one laterally along lines provided for this purpose, and will overlap by 150 mm (6 in) the field surface. Cap sheet membranes for flashings must be spaced at least 100 mm (4 in) with respect to the cap sheet membranes on the field surface, to avoid areas of excessive membrane thickness.

.3 Cut off corners at end laps of areas to be covered by the next roll.

.4 Use a chalk line to draw a straight line on the field surface 150 mm (6 in) from the flashings and parapets.

.5 Apply a coat of self-adhesive membrane primer on the field surface and allow to dry.

.6 Position the pre-cut membrane. Remove 150 mm (6 in) of the silicone release film to hold the membrane in place at the top of the flashing.

.7 Then, gradually peel off the remaining silicone release film, pressing down on the membrane with an aluminum applicator to ensure good adhesion. Use the aluminum applicator to ensure a perfect transition between the flashing and the field surface. Smooth the entire membrane surface with a membrane roller for full adhesion.

.8 Apply pressure on the entire membrane surface with a membrane roller for full adhesion.

.9 Adhere the first 50 mm (2.0 in) of the self-adhesive side laps using a membrane roller, then heat-weld the last 50 mm (2.0 in) (self-adhesive, heat-welded side laps).

.10 Apply adhesive for the first 125 mm (5 in) of the end lap using a steel trowel with 5 mm (3/16 in) notches.

.11 Complete the application by welding the last 25 mm (1 in) of the overlap to the field surface, using an electric hot-air welder and a membrane roller.

3.8 FIELD QUALITY CONTROL

.1 Inspections:

.1 Inspection and testing of roofing application will be carried out by the Departmental Representative.

3.9 CLEANING

.1 Remove bituminous markings from finished surfaces.

.2 In areas where finished surfaces are soiled caused by work of this section, consult manufacturer of surfaces for cleaning advice and complying with their documented instructions.

.3 Repair or replace defaced or disfigured finishes caused by work of this section.

.4 Remove waste from site daily.

.5 Ensure that all materials are secured to roof to prevent wind blow-off.

.6 On completion of work, check roof drains and ensure their cleanliness and proper function. Ensure roof drains and interior rain water leaders of free and clear of all roofing debris.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 01 33 00 Submittal Procedures

.2 07 03 32 Cedar Shake Roofing

.3 07 52 00 Modified Bituminous Roofing Membrane

.4 07 92 10 Joint Sealants

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide lump sum cost for the installation of all metal work, including the gutter and eave troughs repairs, new downspout, and all new sloped copper roofs. The lump sum prices for the metal work will include all costs necessary to complete the work, including all materials and labour.

.1 Lump Sum Price Item 9.0 – Roof Metal Works

1.3 REFERENCES

.1 The Aluminum Association Inc. (AAI)

.1 AAI-Aluminum Sheet Metal Work in Building Construction-2002.

.2 AAI DAF45-03, Designation System for Aluminum Finishes.

.2 American Society for Testing and Materials International (ASTM)

.1 ASTM A167-99(2004), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M-07e1, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM A606-04, Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

.4 ASTM A653/A653M-07, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.5 ASTM A792/A792M-06a, Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

.6 ASTM B32-04, Standard Specification for Solder Metal.

.7 ASTM B370-03, Standard Specification for Copper Sheet and Strip for Building Construction.

.8 ASTM D523-89(1999), Standard Test Method for Specular Gloss.

.9 ASTM D822-01(2006), Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.3 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual 1997.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.

.2 CAN/CGSB-93.1-[M85], Sheet Aluminum Alloy, Prefinished, Residential.

.5 Canadian Standards Association (CSA International)

.1 CSA A123.3-[05], Asphalt Saturated Organic Roofing Felt.

.2 AAMA/WDMA/CSA 101/I.S.2/A440-[2008], Standard/Specification for Windows, Doors, and Unit Skylights.

.3 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.

.6 Green Seal Environmental Standards

.1 Standard GS-03-93, Anti-Corrosive Paints.

.2 Standard GS-11-97] Architectural Paints.

.3 Standard GS-36-00, Commercial Adhesives.

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

.1 Material Safety Data Sheets (MSDS).

.8 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule #1113-[04], Architectural Coatings.

.2 SCAQMD Rule #1168-[05], Adhesives and Sealants.

1.4 SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's printed product literature for sheet metal flashing systems materials, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements and 01 35 43 - Environmental Procedures.

.3 Samples:

.1 Submit two samples 300 mm long of perimeter coping, 300 by 300 mm samples of flashings, showing material and finish.

.2 Submit coating applicator's certificate that sheet metal products received coating system specified.

.4 Shop Drawings:

.1 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.

.2 Indicate details of flashing installation.

.5 Quality assurance submittals: submit following in accordance with Section 01 45 00 - Quality Control.

.1 Manufacturer's Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Stack material in manner to prevent twisting, bending and to provide protection for prefinished surfaces.

.2 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

1.6 WARRANTY

.1 Submit a two-year warranty for work of this Section against defects in materials and workmanship.

.2 Warrant pre-painted aluminum flashings against defects including but not limited to excessive fading, non-uniformity of colour, cracking, peeling or corrosion for a period of five years.

Part 2 Products

2.1 SHEET METAL MATERIALS

.1 Copper sheet: to ASTM B370 temper designation. Match existing at Banff Administration Building.

.2 Counter flashings in other locations: 20 oz copper flashings.

.3 Accessories: As required, compatible with materials used.

.4 Fastenings: Same finish as sheet being fastened, sized to suit site conditions.

.5 Sealant: CAN/CGSB-19.13-M, one component DC795 by Dow Corning Inc. Primer as recommended by sealant manufacturer. Colour to match flashing finish colour.

.6 Backpaint: ASTM D1187 Bituminous Paint.

2.2 ACCESSORIES

.1 Finishing Nails: #12 hot dipped zinc coated, annular ringed.

.2 Sheet Metal Screws: Colour-matched, self-tapping pan head.

.3 Bituminous Paint: CGSB 1-GP-108M, Type II.

.4 Sealing Compound: Rubber asphalt to CGSB 37-GP-29M.

.5 Sealant Compound: One component compound, polyurethane base, chemical curing.

.6 Tech screws with neoprene washers

.7 Pre-finished metal hook strips for metal parapet wall cap flashings

2.3 FABRICATION

.1 Construct flashing joints to allow for flashing movement, using flat "S" lock seams. Maintain minimum of 22 mm lap on all joints. Maintain anchor projection of the "S" lock to 25 mm. At inside and outside corners, mitre the joint, and use upstanding seams, 25 mm minimum height and 22 mm minimum lap.

.2 Form pieces in 2400 mm maximum lengths.

.1 Make allowance for expansion at joints.

.3 Hem exposed edges on underside 12 mm.

.1 Mitre and seal corners with sealant.

.4 Fabricate cap flashing to have drip leg, minimum 100 mm.

.5 Fabricate cap flashing to lap 100mm over membrane flashings.

.6 Pre-finished metal hook strips shall be minimum 24 gauge.

.7 **No section of metal flashing is to exceed 1500 mm (5') in length in the straight runs**. All sections of parapet metal cap flashing are to be secured with a minimum of two clips installed on the exterior face and one (1) colour-matched fastener (complete with neoprene washer) on the interior face.

.8 Metal fascia flashings in excess of 100mm (4") are to be fabricated with a 'V' break parallel to the length of the flashing at 100mm (4") intervals down the fascia. The 'V' break is to project no less than 12mm (1/2") from the fascia. Cross (X) broken fascia flashing is not acceptable.

2.4 METAL FLASHINGS

.1 Form flashings, copings and fascias to profiles indicated of copper to match existing.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.1 WORKMANSHIP

.1 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.2 Back-paint sheet metal with bituminous paint on surfaces in contact with concrete, masonry, cementitious materials, or dissimilar metal.

3.2 INSTALLATION

.1 Remove, salvage, and return all existing copper flashing to PCA.

.2 Provide continuous metal drips, cleats, clips and starter strips to hold flashing in true planes without deformation. Secure at 300 mm maximum

.3 Use concealed fastenings except where approved before installation.

.4 Provide underlay under sheet metal.

.1 Secure in place and lap joints 100 mm.

.5 Counter-flash bituminous flashings at intersections of roof with vertical surfaces and curbs.

.1 Flash joints using S-lock forming tight fit over hook strips, to match existing.

.6 Lock end joints and caulk with sealant. Provide sealant between work of this Section and dissimilar materials. Prepare and prime surfaces as recommended by manufacturer. Seal joints watertight. Comply with the requirements of Section 07 92 10, Joint Sealants.

.7 Install surface mounted reglets into existing mortar joints, in the same joints as the existing flashing. Ensure reglets are true and level, and caulk top of reglet with sealant.

.8 Insert metal flashing into reglets, and under cap flashing to form weather tight junction.

.9 Caulk at all reglet and trap flashings with new urethane sealant.

.10 Metal flashing details are to be installed no later than seven (7) days after completion of the roof membrane assembly.

3.3 EAVESTROUGHS AND DOWNSPOUTS

.1 Remove perforated covers from within eave troughs at all downspout locations. Replace with mesh.

.2 Flush eave troughs and downspouts to remove debris. Conduct ponding test to assess low-points and leaks.

.3 Adjust eave trough slope to provide positive drainage to downspout locations.

.4 Seal holes, gaps and poorly connected sections with solder.

.5 Reattach eave trough strapping where connecting fasteners are missing. Provide new eaves trough strapping where existing is missing or corroded. Replace sections which are bent beyond repair.

.6 All new eaves trough shall match existing.

.7 Replace missing sections of downspout to match existing.

3.4 CLAMP TITE SCUPPER

.1 Verify existing conditions before starting work.

.2 Verify dimensions, tolerances, and method of attachment to membrane materials.

.3 Verify scupper openings and adjoining membrane materials are ready to receive work of this section.

.4 Install scupper and drain seal as per manufacturer's written instructions.

.5 Install downspout to scupper outlet, matching existing downspouts on site.

.1 Base of downspout to extend 300 mm out from building and terminate with surface drainage.

3.5 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.6 CLEANING

.1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Leave work areas clean, free from grease, finger marks and stains.

END OF SECTION

Part 1 General

1.1 SECTION INCLUDES

.1 Materials, preparation and application for caulking and sealants.

1.2 REFERENCES

.1 American Society for Testing and Materials International, (ASTM)

.1 ASTM C919-02, Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)

.1 CGSB 19-GP-5M-1984, Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).

.2 CAN/CGSB-19.13-M87 Sealing Compound, One-component, Elastomeric, Chemical Curing.

.3 CGSB 19-GP-14M-1984, Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).

.4 CAN/CGSB-19.17-M90, One-Component Acrylic Emulsion Base Sealing Compound.

.5 CAN/CGSB-19.24-M90, Multi-component, Chemical Curing Sealing Compound.

.3 Department of Justice Canada (Jus)

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

.4 General Services Administration (GSA) - Federal Specifications (FS)

.1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

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

.1 Material Safety Data Sheets (MSDS).

.6 Transport Canada (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.3 SUBMITTAL

.1 Submit product data in accordance with Section 00 00 10 – General Requirements, 1.7 Submittals.

.2 Manufacturer's product to describe.

.1 Caulking compound.

.2 Primers.

.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit samples in accordance with Section 00 00 10 – General Requirements, 1.7 Submittals.

.4 Submit duplicate samples of each type of material and colour.

.5 Cured samples of exposed sealants for each color where required to match adjacent material.

.6 Submit manufacturer's instructions in accordance with Section 01 33 00 Submittal Procedures

.1 Instructions to include installation instructions for each product used.]

1.4 DELIVERY, STORAGE, AND HANDLING

.7 Deliver and store materials in original wrappings and containers with manufacturer's seals and labels, intact. Protect from freezing, moisture, water and contact with ground or floor.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from site and dispose of waste materials at appropriate waste management facilities.

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

.3 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.

.4 Unused sealant material must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.5 Divert unused joint sealing material from landfill to official hazardous material collections site.

.6 Empty plastic joint sealer containers are not recyclable. Do not dispose of empty containers with plastic materials destined for recycling

1.6 PROJECT CONDITIONS

.1 Environmental Limitations:

.1 Do not proceed with installation of joint sealants under following conditions:

.1 When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 4 degrees C.

.2 When joint substrates are wet.

.2 Joint-Width Conditions:

.1 Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:

.1 Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

1.7 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (MSDS) acceptable to Labour Canada.

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

Part 2 Products

1.8 SEALANTS

.1 Tremco Dymeric (two component polyurethane) or Sikaflex, or Consultant approved equivalent.

.2 Cleaning Compound: Xylene or trisodium phosphate, as per manufacturer’s recommendations.

.3 Primer: As per manufacturer’s recommendations.

.4 Colour: As approved by the Owner.

.5 Backer Rod: Softrod non-gassing closed cell or approved equivalent.

.6 All sealants used will be from the same manufacturer, and delivered and stored at the site in original containers.

Part 3 Execution

3.1 PROTECTION

.1 Protect installed Work of other trades from staining or contamination.

3.2 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Use clean rags or paper towels for cleaning.

.4 Change to clean rags frequently, as the rags become soiled. The use of white rags will help in seeing the soiling. The use of soiled rags will not be tolerated on site.

.5 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.6 Ensure joint surfaces are dry and frost free.

.7 Completely remove all traces of the old sealant(s), especially if the new sealant is of a different type. Methods will be discussed on site, and must be approved by the Departmental Representative.

.8 Ensure not to spread the material being removed by the solvent over the face of the area cleaned. Residue left may discolour or stain the face of the exterior surfaces.

.9 Prepare surfaces in accordance with manufacturer's directions.

3.3 PRIMING (IF REQUIRED)

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

.3 Only prime as much joint as you can seal in the same day. Day old primer will have to be re-primed.

3.4 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.5 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.6 APPLICATION

.1 Sealant.

.1 Apply sealant in accordance with manufacturer's written instructions.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 Apply sealant in continuous beads.

.4 Apply sealant using gun with proper size nozzle.

.5 Use sufficient pressure to fill voids and joints solid.

.6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.7 Tool exposed surfaces before skinning begins to give slightly concave shape.

.8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing.

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until proper curing has taken place.

.3 Cleanup.

.1 Clean adjacent surfaces immediately and leave Work neat and clean.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK

.1 Repainting of existing wood window frames, fly screens, wood trim and ventilation grills.

.2 Repainting of existing metal handrails and guardrails.

.3 Painting of new wood facia, soffit and trim.

.4 All existing painted surfaces likely contain lead based paint. Take paint samples and have tested to verify the quantity of lead present. Where paint is to be removed it shall be collected and disposed of at an approved disposal location. Utilize wet removal techniques to avoid any dust, ensure workers have adequate protection and provide proper clean-up/disposal of all waste debris. Abide by applicable regulations for worker and public safety.

1.2 MEASUREMENT AND PAYMENT PROCEDURES

.1 Provide lump sum cost to complete all painting work as identified on the drawings. The total cost shall include all costs necessary to complete the painting work, including all required materials (such as paints, accessories, protection coverings, etc.) and labour.

.1 Lump Sum Price Item 10.0 – Painting

1.3 RELATED SECTIONS

.1 01 33 00 – Submittal Procedures

.2 02 83 10 - Lead Based Paint Abatement.

1.4 ALTERNATIVES

.1 Obtain Departmental Representative's approval before changing procedures, manufacturer's brands, sources of supply of materials during entire contract.

1.5 REFERENCE STANDARDS

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

.1 Material Safety Data Sheets (MSDS).

.2 Master Painters Institute (MPI)

.1 Maintenance Repainting Manual [current edition], Master Painters Institute (MPI) including Identifiers, Evaluation, Systems, Preparation and Approved Products List.

.3 National Fire Code of Canada (NFC), [2015].

1.6 SUBMITTALS

.1 Information 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 paints and coating products and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit WHMIS MSDS

.3 Samples:

.1 Submit full range of coating colour sample matches for review and selection.

.2 Closeout Submittals

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for paints and coatings for incorporation into manual.

.1 Provide records of products used. List products in relation to finish system and include following:

.1 Product name, type and use (e.g. materials and location).

.2 Manufacturer's product number.

.3 Colour code numbers.

.4 Manufacturer's Material Safety Data Sheets.

.3 Submit maintenance record of painting work.

.3 Maintenance Material Submittals

.1 Extra Stock Materials:

.1 Submit one, 4 litre can of each type and colour of finish coating. Identify type and colour in accordance with established colour schedule and finish system.

1.7 QUALITY ASSURANCE

.1 Regulatory Agency Sustainability Approvals:

.1 Conform to applicable standards and requirements for exterior repainting work including cleaning, preparation and priming.

.2 Retain purchase orders, invoices and other documents and produce when requested by Departmental Representative.

.2 Mock-ups:

.1 Construct mock-ups of 1 entire window for each color, including the preparation, application of linseed oil, and the protection of window following application.

.2 Construct mock-up of 1 m of length of handrail, including the preparation, application of paint and protection following painting.

.3 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with work.

.4 When accepted, mock-up demonstrates minimum standard for this work. Mock-up may remain as part of finished work.

1.8 STORAGE AND HANDLING OF MATERIALS

.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.

.1 Labels: to indicate:

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with established colour schedule.

.3 Storage and Handling Requirements:

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

.2 Store and protect paints and coatings.

.3 Keep areas for storage, cleaning and preparation, clean and orderly.

.4 Remove paint materials from storage in quantities required for same day use.

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

.6 Store materials and equipment within temperature range between 7 degrees C to 30 degrees C.

.7 Store materials and supplies away from heat generating devices and sensitive materials above minimum temperature as recommended by manufacturer.

.8 Replace defective or damaged materials with new.

.4 Fire Safety Requirements:

.1 Provide one 9 kg type ABC dry chemical fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site daily.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).

1.9 AMBIENT CONDITIONS

.1 Substrate and ambient temperatures: in accordance with limits prescribed by manufacturer.

.2 Apply paint finish in areas where:

.1 Dust is no longer being generated by related construction operations.

.2 Wind conditions are such that airborne particles will not affect quality of finished surface.

.3 Substrate and ambient air temperature, humidity and moisture content levels:

.1 Do not perform repainting work when:

.1 Ambient air and substrate temperatures are below 10 degrees C.

.2 Substrate temperature is over 35 degrees C.

.3 Substrate and ambient air temperatures are expected to fall outside paint manufacturer's prescribed limits.

.4 Substrate is wet, damp or frosted.

.5 Maximum moisture content of substrate exceeds: 15% for wood.

.6 Relative humidity is above 85%.

.7 Dew point is less than 3 degrees C variance between air/surface temperatures.

.8 Precipitation is forecast to occur before paint has thoroughly cured.

.9 It is foggy, misty, raining, icing or snowing at site.

.2 Damp and cold weather conditions:

.1 Provide and maintain cover for paint finish.

.2 Heat substrates and surrounding air to comply with temperature and humidity conditions required.

.3 Protect until paint is dry.

.4 Protect until weather conditions are suitable.

.3 Perform work on surfaces exposed to direct, intense sunlight in early morning.

Part 2 Products

2.1 MATERIALS

.1 Use materials from same manufacturer throughout the Work.

.2 Paints and coatings:

.1 Linseed Oil Paint for wood windows: linseed oil paint containing only purified, boiled linseed oil, titanium dioxide, chalk and 20% pure zinc (to prevent mould/mildew growth).

.1 Linseed oil paint to be solvent free.

.2 VOC content less than 1.1%.

.3 Approved manufacturer: ALLBACK Linseed Oil Paint as supplied by Swede Paint Enterprises, or approved equivalent.

.2 Epoxy paint for metal handrails: Use only MPI approved products from the MPI Approved Product Lists corresponding to the specified finishing systems.

.3 Accessories:

.1 For cleaning/preparation of soiled surfaces: Linseed Soap as recommended by manufacturer.

.2 For conditioning bare/new wood: Purified Raw Linseed Oil as recommended by manufacturer.

.3 For filling cracks/holes in existing woodwork: Linseed Oil Putty as recommended by manufacturer.

.4 For sealing knots in wood: Pure Shellac as recommended by paint manufacturer.

.5 Liquid paint remover: Ammonia, chlorine or Linseed Oil Soap as recommended by paint manufacturer.

2.2 COLOURS

.1 All colors are to match existing colors on-site.

.1 Provide drawdowns of each proposed paint colour - 2 samples of each colour required.

.2 Paint colors to match existing

.3 Drawn downs to be min 800mm x 800mm in size.

.2 Final paint colors to be determined in coordination with, and approved by the Departmental Representative.

.3 For pricing, assume the following:

.1 Exterior Window Frame: assume one (1) colour to match existing colour.

.2 Exterior Metal elements: assume one (1) paint colour to match existing colour.

2.3 MIXING AND TINTING

.1 Add pigment, vehicle and coloring matter in accordance to manufacturer's written directions.

.2 Perform colour tinting operations prior to delivery of paint to site.

.3 Obtain Departmental Representative's written approval for on-site tinting of paint materials.

.4 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.5 Where thinner is used, addition not to exceed paint manufacturer's recommendations.

.6 Do not use kerosene or other organic solvents to thin water-based paints.

.7 Thin paint for brush and roller application or spraying in accordance with paint manufacturer's recommendations.

.1 Obtain instructions in writing from manufacturer and provide copy of instructions to Departmental Representative.

.8 Re-mix paint in containers prior to and during application. Ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

2.4 WINDOW HARDWARE

.1 Reuse recycled historic hardware that is in operable condition; clean and refinish as required.

.2 Replacement hardware for windows shall match existing fittings, and match brass finish.

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 PROTECTION OF IN-PLACE CONDITIONS

.1 Protect existing building surfaces and adjacent structures with non-staining covers, masking against paint spatters, markings and other damage.

.2 Protect items permanently attached to surfaces.

.3 Remove and safely secure and store light fixtures, surface hardware on doors, and surface mounted equipment, fittings and fastenings prior to undertaking painting operations.

.4 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting progresses.

.5 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

3.3 PREPARATION

.1 Remove all bug screens and window hardware in order to facilitate work.

.1 Mark/track with non-staining materials to ensure each bug screen and all window hardware components are reinstated in same location upon completion of work.

.2 Remove existing paint finish as per Contract requirements and Section 02 83 10 – Lead-Base Paint Abatement – Minimum Precations.

.3 Clean and prepare exterior surfaces in accordance with paint system manufacturer’s instructions:

.1 Remove dust, dirt, and surface debris by brushing or wiping with dry, clean cloths.

.2 Wash surfaces with linseed oil soap and clean warm water using a stiff bristle brush. If mould/mildew is present, first clean surface with pure ammonia, rinse and clean with linseed soap. Ensure existing substrate is not damaged by process.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Do not use pressure/power washer equipment. Use trigger operated spray nozzles for water hoses at normal municipal supply pressure.

.5 Allow surfaces to drain completely and dry thoroughly.

.6 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before priming.

.4 Condition bare wood with purified raw linseed oil.

.1 Apply as per manufacturer’s recommendations.

.2 Allow raw linseed oil to dry for 24 hours prior to installing paint finish.

.5 Fill cracks and/or holes in existing woodwork with linseed oil putty.

.1 Allow linseed oil putty to dry for 24 hours prior to installing paint finish. Or dust with chalk and paint immediately.

.6 Seal knots in wood with pure shellac to prevent resin from bleeding through paint finish.

.7 Obtain written approval of prepared surfaces by Departmental Representative before applying paint.

3.4 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

.1 Install a minimum of **three coats** of linseed oil paint on all surfaces requiring painting/repainting.

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.1 Apply paint:

.1 To adequately prepared surfaces and within moisture limits.

.2 When previous coat of paint is dry and adequately cured.

.3 In accordance with manufacturer's written instructions.

.2 Do not apply paint to silicone.

.3 Apply paint with brush, or sprayer.

.1 Obtain Departmental Representative's approval of application method before commencing work.

.2 Thoroughly mix paint before and during painting

.3 Apply paint thinly, especially on non-porous surfaces.

.4 Thoroughly mix paint before and during painting.

.4 Brush Application:

.1 Apply paint in a uniform layer using brush and/or roller suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Brush out runs and sags, and overlap marks.

.4 Remove runs and sags from finished work and repaint.

.5 Spray Application:

.1 Maintain paint ingredients properly mixed in containers during paint application as frequently as necessary and as per manufacturer’s recommendations.

.2 Apply paint in uniform layer, with overlapping at edges of spray pattern.

.3 Back roll spray applications and immediately brush out runs and sags.

.4 Use brushes to work paint into cracks, crevices and places that are not adequately painted by spray.

.6 Difficult to access places: apply coating with dipping sheepskins, daubers or other special tools when no other method is practical. Obtain approval of method from Departmental Representative.

.7 Apply paint coats in continuous manner.

.8 Allow surfaces to dry and cure between coats for minimum time period as recommended by manufacturer.

.1 24 hours dry time between coats in ideal conditions. Environmental factors such as high humidity and/or low temperatures will increase dry and cure times. Adjust painting schedule to suit conditions.

.9 Minimum dry film thickness of coats: not less than that recommended by manufacturer.

.10 Repaint thin spots and bare areas before applying next coat of paint.

.11 Sand and dust between coats to remove visible defects.

.12 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents between applications of coats.

.13 Finish to doors and windows: includes top, bottom and side edges.

.14 Paint surfaces concealed by hardware.

3.5 FIELD QUALITY CONTROL

.1 Standard of acceptance:

.1 When viewed using natural prevailing sunlight at peak period of day (mid-day) on surface viewed, surfaces to indicate following:

.1 No defects visible from a distance of 1 metre at 90 degrees to surface, or from a distance of 1 metre at 45 degrees to surface.

.2 Final coat: to exhibit uniformity of colour and sheen across full surface.

.3 Defects include brush marks, streaks, runs, laps, drips, heavy stippling, pile up of paints, roller tracking, inadequate hiding of substrate, skipped or missed areas, and foreign materials in paint

.2 Advise Departmental Representative when each surface and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved by Departmental Representative.

.3 Co-operate with Paint Inspection Agency and provide access to areas of work.

.4 Manufacturer's Field Services:

.1 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

.5 Conduct moisture tests on substrates.

.1 Use calibrated electronic moisture meter.

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 Reinstall and clean removed items after painting is completed.

.3 Remove paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.

.1 Clean and restore as directed by Departmental Representative.

.4 Wipe spills and spots immediately with a damp cloth.

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

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

.7 Reduce the amount of contaminants entering waterways, sanitary/storm drain systems and into the ground. Adhere to following procedures:

.1 Retain cleaning water for water-based materials. Allow sediments to be filtered out. Do not use free-draining water to clean equipment.

.2 Return oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

.3 Dry empty paint cans prior to disposal or recycling.

.4 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store product in well-ventilated fire-safe area at moderate temperature.

.5 Where paint recycling is available, collect waste paint by type and provide for delivery to recycling facility.

.6 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials, and debris.

.7 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with Federal, Provincial and Municipal regulations.

.8 Clean equipment and dispose of wash water used for water borne materials, solvents used for oil based materials as well as cleaning and protective materials, paints, thinners, paint removers/strippers in accordance with Federal, Provincial and Municipal regulations.

.9 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Dispose of sediment remaining from cleaning operations in accordance with Federal, Provincial and Municipal regulations.

3.7 HARDWARE RE-INSTALLATION

.1 Clean and re-install hardware items removed and stored previous to commencement of the Work.

.2 Re-install hardware items and bug screens in original locations.

3.8 PROTECTION

.1 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.

.2 Remove paint splashings on exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent.

.3 Protect completed work from paint droppings. Use non-staining coverings.

.4 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Departmental Representative].

.5 Remove protective coverings and warning signs as soon as practical after operations cease.

END OF SECTION

1. GENERAL

.1 Install new Zurn Z100 15" diameter roof drain in complete with cast metal clamping rings (including upper and underdeck clamping rings), cast metal debris domes and all related components required to make watertight connections to the interior rain water leaders.

.2 Include for the disconnection, lifting, temporary storage, re-lifting and reinstallation of any existing roof top mechanical units or equipment to allow for installation of new roof assembly components.

END OF SECTION

1. GENERAL

.1 All electrical components shall be disconnected and reconnected in accordance with the Canadian Electrical Code 2012, Part I.

.2 Banff Parks is to be notified immediately of all existing wiring methods which are not in accordance with the Canadian Electrical Code 2012, Part I.

.3 NOTE: Any rooftop appurtenances shall be moved by the Contractor to facilitate curbing and flashing to the required height. Disconnection, re-connection, and start-up of the utilities shall be done by the Contractor at his expense.

END OF SECTION

Part 1. General

.1 Not Used.

Part 2. Products

.1 Match existing.

Part 3. Execution

3.1 RESTORATION, GENERALLY

.1 Restore all existing areas and sitework damaged or disturbed due to earthwork or other work of this Contract, back to their original condition.

3.2 RESTORATION OF LANDSCAPED AREAS

.1 Replace damaged topsoil, as approved by Departmental Representative.

.2 Restore grassed areas with new sod, as approved by Departmental Representative.

3.3 RESTORATION OF ASPHALT PAVING

.1 Compact fill material to a level 300 mm below finished surface grade.

.2 Place fill material to level of underside of existing asphalt.

.3 Where edges of existing paving have become ragged, cut paving to form a straight line prior to placing new paving.

.4 Thoroughly clean edges of existing paving and coat with bituminous bonding agent prior to placing asphalt.

.5 Place asphalt in maximum 75 mm lifts.

.6 Compact new asphalt paving using a steel wheel roller with a minimum weight of 8 tonnes.

.7 Ensure finished grade of asphalt paving conforms to existing surface with no rises, depressions or ridges.

3.5 RESTORATION OF GRAVEL SURFACING

.1 Replace disturbed gravel surfacing with fill material to thickness equalling that of existing gravel.

.2 Grade gravel to match existing elevations and surfaces.

.3 Compact gravel to 95% of Standard Proctor Maximum Dry Density.

3.6 FINAL CLEANING

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

.2 Remove waste products and debris including that caused by Owner or other Contractors.

.3 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative.

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

.5 Clean and polish glass, hardware, stainless steel, and electrical fixtures. Replace broken or scratched glass as directed by the Departmental Representative.

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

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

.8 Remove dirt and other disfiguration from exterior surfaces.

.9 Clean and sweep roofs, gutters, downspouts, drainage systems, and sunken wells.

.10 Sweep and wash clean paved areas.

.11 Remove snow and ice from access to building.

END OF SECTION

APPENDIX A

Design Drawings / Repair Details

APPENDIX B

EA: Mitigations for Reducing Impacts of Building Projects

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects

Activity	Potential Impacts	Mitigation Measures
Pre-planning		
Site investigation, including geotechnical investigation	Sensory disturbance, disturbance of archaeological resources, slope failure, sedimentation	• Conduct Phase I Environmental Site Assessment, if not already completed for the site, and additional site surveys, test pits, bore holes etc. if necessary. • Minimize the time boreholes remain open in order to reduce small terrestrial wildlife mortality. Properly seal boreholes and fit PVC pipes. • Use existing roadways or disturbed areas for site access and travel within the site. • Follow appropriate excavation mitigation measures for geotechnical investigation (see mitigations for "Trenching").
General planning activities specific to all building projects.	Runoff / sedimentation; soil contamination	• Prepare an Emergency Response Plan for the worst case, i.e., heavy rainfall and runoff events, high winds, spills, fires, etc. • In the event of emergency operations (as defined in Section 4.11 of the MCSR), call 911. The Warden Dispatch can also be contacted (available 24 hours/day) at (403) 762-4506 or the Wardens Office at (403) 762-1470 to notify of any emergency procedures required. • Ensure all activities are conducted at least 30 m from waterbodies.
	Dust production	• Have a water source available to wet down exposed soil and dry areas.
	Wind and water erosion	• Prepare a satisfactory Sediment and Erosion Control Plan covering all construction and restoration periods. • Acquire necessary sediment control equipment (i.e., straw bales, landscaping fabric, sediment fences, etc.) and install prior to construction. • Extra planning should be used for areas with silty deposits (VL3 and VL4) and sloped areas with sandy deposits (see Figure 4.2).
	Compaction of soils	• Identify soils susceptible to compaction (fine textured and organic soils). • In sensitive areas, use equipment of low bearing weight, low PSI tires, or tracked vehicles.
	Slope failure	• Assess slope stability (based on slope length, soil texture, steepness, soil depth) and adjust activities to avoid these areas if possible. Use appropriate setbacks. • Pay particular attention when planning for slopes of Class 6 (15-30%) or greater, especially where soils are shallow and likely to move with disturbance.
	Habitat loss and fragmentation; or encroachment on wildlife movement corridor	• Identify wildlife habitat that may be impacted by activities and avoid sensitive areas, including wetlands. • Ensure only necessary vegetation is removed and delineate areas to be avoided with biodegradable flagging tape and/or temporary fences.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
General planning activities (continued)	Sensory disturbance and mortality of wildlife	When working adjacent to natural areas: • According to the wildlife that may be present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, migration). Consult with Parks Canada (403-762-1416) to discuss any localized wildlife concerns. • Confine "noise" activities to hours set out in Town of Banff Noise Bylaw. • Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas were wildlife mortality has or is likely to occur. • Educate workers to not harass or attract wildlife, keep the site free of food scraps, and dispose of garbage in bear proof containers.
	Disturbance of archaeological resources	• Consult with Parks Canada (403-762-1416) to discuss if consultation with the Park's archaeologist is required (see Figure 4.1). • If it is deemed that potential archaeological sites may be subject to ground disturbance activities should be adapted to avoid them. • Educate workers to notify site supervisor upon finding any archaeological artefacts and to stop work immediately.
	Increased water and energy consumption	• Identify water and energy conservation opportunities for building design (e.g., low flow fixtures, low energy heating and lighting) and outdoor requirements (e.g., yard lighting, drip irrigation systems).
	Public safety	• Outline traffic control measures and assess the need for flagging personnel. • Call utility line companies to identify infrastructure locations (Alberta OneCall: 1-800-242-3447).
	Reduced aesthetics (noise and visual)	• Evaluate the site layout, access routes and construction activities to minimize their visual impact. • Plan work schedule to confine "noise" activities to hours set out in Town of Banff Noise Bylaw and, if possible, periods of low visitation.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Site Preparation		
Clearing of vegetation	Dust production	• Wet down dry, exposed soils, particularly during windy periods. • Ensure materials being stored or transported are covered with tarps or equivalent material.
	Runoff / sedimentation	• Halt construction activity on exposed soil during events of high rainfall intensity and runoff and refer to the Sediment and Erosion Control Plan. Periodically inspect erosion control structures for effectiveness.
	Wind and water erosion	Particularly in areas with silty deposits (VL3 and VL4) and sloped areas with sandy deposits (Figure 4.2): • Protect exposed soils with coarse granular materials, mulches, straw, or landscaping fabric along drainage pathways. • Minimize grubbing.
	Damage to adjacent vegetation, loss of native vegetation	To protect undeveloped areas adjacent to development site: • Minimize area cleared. Clearly mark area to be cleared with biodegradable flagging tape and/or temporary fences. • Ensure vertical (Rocky Mountain) juniper, Douglas fir and limber pine are protected. • For every tree removed, two native trees must be planted. • Hoarding around trees to be retained must be installed beyond the tree's drip line prior to commencement of site work. • A development permit from the Town of Banff Planning and Development Division (403-762-1215) is required before removing any trees. • Ensure excavated material does not damage or bury plant material that is to be retained on the site or in adjacent areas. • Trees are to be cut so that they fall inside the cleared perimeters. • Care must be taken during grubbing and stripping to ensure that trees and roots on the edge of the cleared area are not disturbed. • Grubbing and stripping may not be permitted on steep slopes to reduce the potential for erosion.
	Wildlife habitat loss and fragmentation; or encroachment on wildlife movement corridor	When working adjacent to all undeveloped areas and areas bordering natural habitat, especially wildlife movement corridors and natural wetlands: • Clear only the minimum area required for construction activities. • Retain vegetation barriers where possible, especially trees and shrubbery.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Clearing of vegetation (continued)	Reduced aesthetics	• Transport stockpiled material offsite immediately or stockpile cleared vegetation in an area out of view from public until it can be disposed of appropriately (see mitigations for "Disposal of cleared material"). • Dispose of cleared vegetation as soon as possible.
Grading and excavation	Dust production / aesthetics	• Wet down dry, exposed soils. • Ensure materials being stored or transported are covered with tarps or equivalent material. • Minimize grading and excavation on windy days to limit dust production.
	Runoff / sedimentation	Halt construction activity on exposed soil during events of high rainfall intensity and runoff. • All excavations will remain free of water (see mitigations for "Dewatering"). • Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover. Sites close to waterbodies, but not closer than 30 m: • To ensure that site run-off is minimized, control overland flow up gradient and down gradient of excavated areas by use of effective diversion ditches, bales, vegetation filter strips, or sediment traps.
	Wind and water erosion	• Particularly in areas with silty deposits (VL3 and VL4 - see Figure 4.2), and sloped areas with sandy deposits: • Protect exposed soils with coarse granular materials, mulches, or straw. • Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover.
	Loss of topsoil and/or topsoil-subsoil mixing	• Use separate lifts and storage of topsoil and subsoil horizons, replacing them in the same order after completion of activity, wherever practical. • Topsoil will be stored away from any slopes, subsoils, spoil material, construction activities and day-to-day operations.
	Slope failure	• Avoid work on steep slopes unless absolutely necessary. Areas with slopes of Class 6 (15-30%) or greater, especially where shallow soils overlie bedrock: • Use appropriate geo-technical control measures to stabilize slopes. Consult occupational health and safety guidelines.
Disposal of cleared material	Dust production	• Ensure cleared vegetation being stored or transported is covered with tarps or equivalent material.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Disposal of cleared material (continued)	Reduced aesthetics (visual)	• Minimize the time cleared vegetation remains at the work site. • Large timber (trees larger than 15 cm DBH) shall be cut into blocks not to exceed 35 cm and stockpiled for re-use as firewood. • Smaller trees and other woody material may be chipped and sent to the Cascade pit, or burned, if a burning permit is obtained. Dispose of diseased vegetation by burning. • Dispose of trade waste at the Bow Valley Waste Management Commission's Class III landfill.
Construction		
Dewatering	Sedimentation; Erosion; Damage to vegetation	• Dewatering is not permitted into any waterbody, including the Bow River and Whiskey Creek. Dewatering is permitted across previously disturbed vegetation or natural vegetation if the following conditions are met: • Sediment controls are used (i.e., silt fences, silt bags, etc.). • Water velocity is controlled to dissipate energy, prevent soil erosion and allow for infiltration. • Dewatering structures are continuously monitored to ensure no damage is being done to soil or vegetation. • As an interim measure, the Town may allow silty water to be pumped into the sanitary system. A permit is required (403-762-1215). • Parks Canada does not allow dewatering into storm sewers unless it can be demonstrated that the proponent has the methods and equipment to limit sediment entering the receiving waterbody. • Sediment from the traps may be used as fill on the construction site.
	Damage to adjacent vegetation	• For undeveloped areas adjacent to development site, ensure water and sediment is directed away from natural areas.
	Sensory disturbance and mortality of wildlife	When working adjacent to natural areas: • According to the wildlife that may be present, schedule, high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, migration). Consult with Parks Canada (403-762-1416) to discuss any localized wildlife concerns. • Confine "noise" activities to hours set out in Town of Banff Noise Bylaw. • Consider posting wildlife signs to reduce vehicle speeds and increase driver awareness near construction areas were wildlife mortality has or is likely to occur. • Educate workers to not harass or attract wildlife.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Construction (sandblasting)	Dust production (sand blasting)	• Minimize sandblasting. • Confine activity to days with little or no wind and use physical barriers (e.g., shrouds, scaffold canopies) to contain dust. • Sandblasting should only remove loose paint to provide a clean surface for the new paint to adhere to. To reduce the amount of old paint needed to be removed, the new paint to be used should be as similar in colour as possible to the existing painted surface.
Construction (painting and paint stripping)	Contamination of soil and water from accidental spill of paint, stripping compounds, or thinner	• Prepare an appropriate Spill Response Plan and ensure that spill contingency equipment and measures are in place before work begins. • Ensure paint is stored appropriately to prevent spillage. • In the event of emergency operations (as defined in Section 4.11 of the MCSR), call 911. The Warden Dispatch can also be contacted (available 24 hours/day) at (403) 762-4506 or the Wardens Office at (403) 762-1470 to notify of any emergency procedures required. • Waste oil based paints must be transported out of the Park in accordance with the Federal and Provincial *Transportation of Dangerous Goods Act* and Regulations. • Dispose of contaminated materials at provincially certified disposal sites outside of the Park. No treatment of contaminated soils (e.g., bioremediation) is allowed in the Park. All applicable documentation demonstrating proper disposal should be obtained. Alternatively, use the paint exchange program in Banff.
Site Servicing (Subsurface)		
Trenching, Utilities excavation and removal	Runoff / sedimentation	• To ensure that site run-off is minimized at times of heavy rainfall, control overland flow up gradient and down gradient of exposed areas by use of effective diversion ditches, bales, vegetation filter strips, or sediment traps.
	Wind and water erosion	Particularly in areas with silty deposits (VL3 and VL4) and sloped areas with sandy deposits (see Figure 4.2): • Use interceptor ditches or berms (bales) up-gradient of excavation to divert overland flow around exposed soils • Line steep ditches with filter fabric, rock or polyethylene lining to prevent channel erosion.
	Wildlife mortality	• Fence trench if it is to be left unattended overnight.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Trenching; Utilities excavation and removal (continued)	Loss of topsoil and/or topsoil-subsoil mixing	• Wherever possible, use separate lifts and storage of topsoil and subsoil horizons, replacing them in the same order after completion of activity. • Minimize the amount of time that the trench remains open. • Soils will be stored away from any steep slopes, subsoils, spoil material, construction activities and day-to-day operations.
	Slope failure	• Avoid work on steep slopes unless absolutely necessary. Areas with slopes of Class 6 (15-30%) or greater, especially where soils are shallow: • Use appropriate geo-technical control measures to stabilize slopes. Consult occupational health and safety guidelines.
Decommissioning and Abandonment		
Demolition activities / foundation removal	Dust production	• Wet down dry, exposed soils. • Ensure fine materials being stored or transported are covered with tarps or equivalent material.
	Discovery of existing soil contamination	• If any contamination is found, cease work immediately. Inform the building site supervisor and, if necessary, implement Emergency Response Plan.
	Loss of topsoil and/or topsoil-subsoil mixing	• Wherever possible, use separate lifts and storage of topsoil and subsoil horizons, replacing them in the same order after completion of activity. • Soils will be stored away from any grades, subsoils, spoil material, construction activities and day-to-day operations.
Site Reclamation or Restoration		
Grading	Dust production	• Wet down dry, exposed soils. • Ensure materials being stored or transported are covered with tarps or equivalent material.
	Runoff / sedimentation	• Halt grading on exposed soil during events of high rainfall intensity and runoff. Consult the Sediment and Erosion Control Plan. • Cover stockpiles of soil with polyethylene sheeting, tarps, or vegetative cover. Where possible, establishment containment structures to trap runoff.
	Wind and water erosion	Particularly in areas with silty deposits (VL3 and VL4) and sloped areas with sandy deposits (see Figure 4.2): • Protect exposed soils with coarse granular materials, mulches, or straw along drainage pathways. • Recontour slopes to pre-disturbance conditions.
Revegetation	Runoff / sedimentation / erosion	• Initiate replanting of disturbed areas immediately after construction is completed.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Revegetation (continued)	Compaction of soils	• Cultivate affected areas before reclaiming, especially areas with fine textured or organic soils.
	Weed invasion	• Revegetate exposed areas at first opportunity. • Ensure topsoil is clean and weed free. If clean fill is unavailable, check on weeds or treat as needed for 3 years following landscaping and revegetation. • Revegetate with Parks Canada approved grass seed mix or the Town seed mix for landscape rehabilitation (see Appendix C). • Monitor the site to ensure appropriate weed control for two years following landscaping (applicable to construction crews only). • Follow Parks Canada Integrated Pest Management Plan 2.4.1 for weed control.
Herbicide/fertilizer use	Contamination of soil or water	• Accurately assess the need for chemicals during site revegetation. Use products and methods identified in Parks Canada Management Directive 2.4.1 (1985). • Do not use fertilizers and herbicides in areas where residue or run-off may enter a waterbody or drainage pathway. • Do not over water.
Paving	Dust production	• Wet down dry, exposed soils. • Ensure fine materials being stored or transported are covered with tarps or equivalent material.
	Contamination of soil or water	• Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 4.11 of the MCSR), call 911. The Warden Dispatch can also be contacted (available 24 hours/day) at (403) 762-4506 or the Wardens Office at (403) 762-1470 to notify of any emergency procedures required. • Use an environmentally friendly tack coat and do not apply if rain is in the forecast.
	Noise disturbance and mortality of wildlife due to increased traffic	Adjacent to natural areas. • According to the wildlife that may be present, schedule high noise level activities and other intrusive construction activities to avoid critical life stages (breeding, nesting, rearing, migration). Consult with Parks Canada (403-762-1416) to discuss any localized wildlife concerns. • If wildlife mortality is likely to increase due to traffic, post signs to reduce vehicle speeds and increase driver awareness. • Educate workers to not harass or attract wildlife.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
General Activities		
Materials handling / storage	Dust production	• Wet down dry, exposed soils or cover with tarps. • Ensure materials being stored or transported are covered with tarps or equivalent material.
	Damage to adjacent vegetation	• Excavated material will not be permitted to damage or bury plant material that is to be retained on the site or in adjacent areas. • Protect undisturbed land by only stockpiling materials on heavy canvas or polypropylene tarpaulins to protect native vegetation. Excavated material should not be permitted to damage or bury plant material that is to be retained on the construction site or in adjacent areas.
	Decreased aesthetics (visual) and public safety	• Materials will be stored within the confines of the work site.
Equipment operation and maintenance	Decrease in ambient air quality due to emissions	• Ensure all equipment is properly tuned, free of leaks, in good operating order, and fitted with standard air emission control devices. • Minimize idling of engines at all times.
	Dust production	• Wet down dry and dusty roads. • Do not use oil-based dust suppressants. • Reduce speeds. • Ensure fine materials being stored or transported are covered with tarps or equivalent material.
	Contamination of soil and water from accidental spill	• Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 4.11 of the MCSR), call 911. The Warden Dispatch can also be contacted (available 24 hours/day) at (403) 762-4506 or the Wardens Office at (403) 762-1470 to notify of any emergency procedures required. • Avoid work in high risk areas, particularly in areas of high water table, steep slopes or in close proximity to streams. • Have spill containment equipment on-hand and ensure that all personnel are trained in their use. • Ensure all construction equipment is free of leaks from oil, fuel or hydraulic fuels. • The crossing of any waterbody (including wetlands) by construction equipment, or the use of such equipment within waterbodies is strictly prohibited unless prior approval has been confirmed.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Equipment operation and maintenance (continued)	Contamination of soil and water from accidental spill	• Designate refuelling areas at least 100 m away from any water body. Refuelling sites will be bermed with an impermeable liner to contain 125% of the anticipated fuel quantity. Any contaminated rainwater will be moved out of the park.
	Contamination of soil and water from accidental spill	• Refuelling activities should not be conducted where run-off could carry contaminants into drainage pathways (including storm sewers). • Dispose of contaminated materials at provincially certified disposal sites outside of the Park. No treatment of contaminated soils (e.g., bioremediation) is allowed in the Park. All applicable documentation demonstrating proper disposal should be obtained.
	Compaction of soils	• Restrict vehicular travel and other equipment operation to the construction site and approved access routes. • Vehicle parking will be restricted to specialized areas on the construction site. • Minimize or halt construction traffic during wet conditions when the soil shows signs of ponding or rutting. • In sensitive areas, if possible, use equipment which minimizes surface disturbance including low ground pressure tracks/tires, blade shoes and brush rake attachments.
	Damage to adjacent vegetation	Undeveloped areas adjacent to development site: • Careful machine operation is required to ensure that damage to surrounding vegetation does not occur. • Excavated material must not be permitted to bury plant material that is to be retained. Snow fences may be used to prevent excavated material escaping into the surrounding forest. • Hoarding around trees to be retained must be installed beyond the tree's drip line prior to commencement of site work.
	Weed invasion	• All construction equipment from outside Banff National Park will be steam cleaned prior to arrival to minimize the risk of introducing weeds. • Construction equipment from outside the Park will not be washed while in the Park.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Equipment operation and maintenance (continued)	Sensory disturbance to wildlife	• All undeveloped areas and areas bordering natural habitat, especially wildlife movement corridors and natural wetlands: • Use existing roadways, pathways and previously disturbed areas for site access and travel within the site. • Educate workers not to enter wildlife corridors. • Confine "noise" activities to hours set out in Town of Banff Noise Bylaw.
	Increased traffic levels	• Time construction activities to minimize vehicle conflicts on access roads and/or use flagging personnel.
Waste management (general)	Contamination of soil and water from accidental spill or improper disposal	• No rock, silt, cement, grout, asphalt, petroleum product, lumber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, sewer, or other water course.
	Aesthetics (visual and smell)	• Collect all waste, store appropriately and dispose trade waste at the Bow Valley Waste Management Commission's Class III landfill, and garbage at the Waste Transfer Station. • All garbage and food must be stored in bear-proof bins as per the Banff Waste Bylaw. • Construction sites must undergo thorough clean-up, including removal of general litter, survey stakes and flagging tape at project completion.
Hazardous materials collection and handling	Contamination of soil or water	• Prepare an appropriate Spill Response Plan. In the event of emergency operations (as defined in Section 4.11 of the MCSR), call 911. The Warden Dispatch can also be contacted (available 24 hours/day) at (403) 762-4506 or the Wardens Office at (403) 762-1470 to notify of any emergency procedures required. • All toxic/hazardous materials will be identified during demolition and will be handled as required under the Canadian Environmental Protection Act, Transportation of Dangerous Goods Act and Workplace Hazardous Materials Information Service. • Dispose of contaminated materials at provincially certified disposal sites outside of the Park. No treatment of contaminated soils (e.g., bioremediation) is allowed in the Park. All applicable documentation demonstrating proper disposal should be obtained. Alternatively, use the paint exchange program in Banff. • All hazardous materials and wastes will be clearly labelled with WHMIS labels and information. • Spill contingency plans, equipment and supplies will be present on-site at all times and employees trained in their use.

Attachment 1 Sub-Class 1: Buildings: Mitigations for reducing impacts of building projects - *Continued*

Activity	Potential Impacts	Mitigation Measures
Hazardous materials collection and handling (continued)	Contamination of soil or water	• All fuels, oils, lubricants and other petrochemical products will not be stored within 100 meters of any waterbody (including wetlands). • Do not store fuels, lubricants, solvents, paints, and other chemicals on site overnight except within construction trailers secured with lock and key. Storage should be on a bermed, impervious site (secondary containment). Permits are required from Banff National Park or Town of Banff. • No rock, silt, cement, grout, asphalt, petroleum product, lumber, vegetation, domestic waste, or any deleterious substance shall be placed or allowed to disperse into any stream, river, pond, storm or sanitary sewer, or other water course.

APPENDIX C

Lead in Paint Bulk Sampling

DF Technical & Consulting Services Ltd.
Suite # 152-1500-14 Street SW, Calgary, AB T3C 1C9
Ph: 403.229.3131 Fax: 403.245.3224
Toll Free: 855.668.3131

July 30, 2015

Parks Canada
Banff National Park
Banff, Alberta
T1L 1K2

Attention: Laurie MacDonald

Regarding: Hazardous Materials Assessment
Location: Banff Administration Building

Please find enclosed a copy of the report for the lead in paint sampling that was performed by **DF Technical & Consulting Services Ltd.** at Banff Administration Building on July 23, 2015.

If you have any questions or further inquiries contact the undersigned at (403) 229 3131.

Sincerely,

DF Technical & Consulting Services Ltd.

Dennis French CIEC
President

Distribution:

1 copy- Parks Canada.
1 copy- DF Technical & Consulting Services Ltd.

Enclosures

DF Technical & Consulting Services Ltd.
Suite # 152-1500-14 Street SW, Calgary, AB T3C 1C9
Ph: 403.229.3131 Fax: 403.245.3224
Toll Free: 855.668.3131

Lead In Paint Bulk Sampling

Final Report

Date:

July 30, 2015

For:

Parks Canada

Location:

Banff Administration Building

By:

Dennis French

DF Technical & Consulting Services Ltd.

Table of Contents

Appendixes

Executive Summary

The bulk lead in paint assessment involved the collection of suspect lead containing paint by **Parks Canada** and supplied to **DF Technical & Consulting Services Ltd.** at the requested location of the **Banff Administration Building** to determine the presence and concentration of lead within the paint sampled.

Handling

The paint sample that was analyzed was found to contain lead in concentration of >90 mg/kg and is therefore considered lead paint. The concentration exceeds >600 mg/kg therefore removal must be undertaken utilizing specific L**ead Abatement Procedure** and **Air Monitoring**.

Disposal

The paint sample that was analyzed was found to contain lead in concentrations of >5000 mg/kg therefore further leachable lead analysis was conducted to determine proper disposal requirements as per Alberta Environment Protection guidelines.

The leachate sample analysis is under <5mg/L therefore the paint debris as analyzed can be disposed of at a regular class 2 landfill with proper authorization.

Introduction

The bulk lead in paint assessment was conducted on July 23, 2015 by **Parks Canada** and provided to Dennis French of **DF Technical & Consulting Services Ltd.** The sampling was conducted on behalf of Laurie Macdonald of **Parks Canada**. The following report is an overview of the observations, findings, conclusions, and recommendations generated during the assessment.

Site History and Background Information

The building is a historic building located in the Banff Town site. The minor upcoming works involves painting of the old windows that will require scrapping and removal of existing paint layers. As such the lead paint analysis was requested.

Regulations and Guidelines

In Alberta, exposure to lead is regulated under the "Alberta Occupational Health & Safety Act, Regulation and Code (2009)" (OH&S) and in particular, "Part 4: Chemical Hazards, Biological Hazards and Harmful Substances. General Requirements: an employer must ensure that a worker's exposure to any substances listed in Schedule 1, Table 2, is kept as low as reasonably practicable, and does not exceed its occupational exposure limit" (OH&S Act 2009). EPA Toxic Substance Control Act (TSCA) 40CFR761.130, Interpretive Guidance for the Federal program TSCA Sections 402/403 supplies surface lead contamination guidelines which have been referenced in this document.

Assessment & Sampling Methodologies

Lead-Based Paint (LBP) and other Lead Products

Sampling for lead based paint was conducted. Samples of suspect paint were collected and sent for analysis. Those samples found to be lead containing, near or in excess of 5000 mg/kg of lead, would be sent for leachable analysis.

All lead-based paint and other lead product samples are analyzed by **KaizenLAB** in Calgary, Alberta, an independent laboratory, and Member of the American Industrial Hygiene Association, AIHA.

A chain of custody, COC, is initiated to assign pertinent information to all samples suspected of containing asbestos. Typically, the date, type of sampling media, requested analysis methodology, sample collection location, sample measurement, and name of the person in care and control of the sample, and other relative assessment information is recorded. The COC is attached to the sample and the sample is sent to the laboratory. Analysis is returned with a copy of the COC specifying the condition of the sample at the time it was logged, the requested analysis, and signature of the attending lab technician.

Table 1: Sampling Methodologies

Analyte:	**Methodology**
Lead in Paint	EPA 3050B/6010B

Scope and Methodology

The sampling carried out by **DF Technical & Consulting Services Ltd.** consisted of the following.

- Individual field sampling and independent laboratory analysis of lead containing paint. Collected by Parks Canada
- Interpretation of laboratory analysis results.
- Preparation of a report including results and recommendations.

The sampling was conducted in response to an upcoming project consisting of refinishing the exterior of the windows.

The information pertaining to each sample location was documented.

Sampling Locations

1. Exterior Window paint

Lead Sampling Results

Lead in Paint Analyses

Sample #	Location	Result mg/kg	Guideline
1	**Banff Information Centre**	**1680**	90 mg/kg

- Bolded results indicate levels in excess of guidelines

The results of the laboratory analysis indicate that the sample submitted for analysis was found to be above the recommended guideline but not above the threshold to require submission for leachable analysis. A copy of the independent laboratory analysis is included in the Appendixes.

General Comments and Recommendations

The following comments apply to the analysis as reported.

- The paint sample analyzed was found to contain lead in concentrations in excess of the recommended guideline is therefore considered lead containing paint.
- A leachable lead analysis was conducted and the paint sample was found to below waste guidelines and can be disposed of according to Alberta Environment Protection guidelines as a class 2 construction waste rather than a class 1 Hazardous waste.
- Ensure the work area is isolated utilizing barriers and warning signs restricting access to the area until the work is completed.
- A worker decontamination area should be installed adjacent to the work area.
- During removal of the lead paint workers should be protected from exposure to lead.
- Proper personal protective equipment, PPE, including, at a minimum, a National Institutes for Occupational Safety and Health, NIOSH, approved half-mask, nitrile gloves beneath work gloves, and disposable coveralls are recommended.
- Workers may be required to wear full-face, powered air purifying respirators, PAPR, or supplied air respirators depending on the procedures used to remove the lead paint.
- If manual scrapping to remove is employed ensure the waste materials are protected from contact with the ground (utilize a poly sheet ground cover)
- It is recommended that air monitoring be conducted during demolition to ensure workers are not overexposed to lead. **DF Technical & Consulting Services Ltd.** can provide these services.
- Lead is categorized as a Schedule 1 Chemical Substance in the Alberta Occupational Health and Safety Code, 2009. Lead abatement activities require a code of practice from the contractor outlining work controls for safe removal, handling and disposal.

Closure

This report is based on observations and collected data from July 23, 2015. The conclusions made in this report are not a certification of the site's air quality. No warranty is expressed or implied as to final site condition. This report provides an analysis and assessment of materials tested and is based on information provided to **DF Technical & Consulting Services Ltd**.

Regards,

Dennis French CIEC
President
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Appendix I: Independent Laboratory Results

Appendix II: Works Cited

Works Cited

Alberta Environmental Protection. *Alberta Users Guide For Waste Managers.* Edmonton: Alberta Environmental Protection.

Alberta, G. o. (2009). *Occupational Health and Safety Act, Ocupational Health and Safety Code.* Edmonton: Alberta Queens printer.

Center For Disease Control. (1994, August 15). *NIOSH National Institute for Occupational Safety and Health*. Retrieved May 10, 2010, from NIOSH National Institute for Occupational Safety and Health: http://www.cdc.gov/niosh/docs/2003-154/pdfs/9100.pdf

Work Safe Alberta: Occupational Health and Safety: Lead at the Work Site
- http://work.alberta.ca/documents/OHS-Bulletin-CH071.pdf