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 Section 01 35 43 – Environmental Procedures.

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

.3 Appendices

.1 Appendix A – Site location / Site Plans

.2 Appendix B - Design Drawings / Repair Details

.3 Appendix C – EA Mitigations / Best Practices

.4 Appendix D – 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 Visitor Reception Centre. See appendix A for location and site details.

.2 The objective of this project is to:

.1 Complete maintenance and repair to exterior finishes.

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 Generally clean and remove staining, dirt, and lichen from exterior finishes, windows and doors.

.2 Repaint and re-stain exterior wood half-timber elements, trim, soffit, window frames, window sashes, doors and signage. Re-putty and re-caulk at windows.

.3 Repair and replace cupped, warped and deteriorated half-timber elements. Reattach loose half-timber elements.

.3 Repaint exterior metal grills, vents, handrails, guardrails, and exterior stair/landing assemblies.

.4 Repoint at exterior stone masonry. Patch and repair cracked stone masonry.

.5 Patch and repair cracking and spalling at exterior stucco finish. Repaint.

.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 minimal 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 B - Design Drawings / Repair Details.

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

1.7 CONTRACT METHOD

.1 Construct Work under lump sum price contract.

1.8 WORK SCHEDULE

.1 Contractor Mobilization: Upon Contract Award.

.2 Contract Completion:

.1 All work to be completed no later than July 29, 2016.

.3 No additional compensation will be provided to the Contractor for cold weather work or other weather-related delays or costs.

1.9 WORK SEQUENCE

.1 Contractor shall proceed with the work May 16, 2016.

.2 Contractor shall prepare a meaningful bar chart or network diagram showing proposed schedule of major works which shall be provided to Engineer within one week of Contract award and prior to commencement of any work.

.3 When schedule has been approved by Departmental Representative, take necessary measures to complete work within scheduled time. Do not change schedule without Departmental Representative’s approval.

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 Contractor has unrestricted use of site subject to Section 01 14 00 and until the Contract Completion date.

.2 Notwithstanding SACC R2850D - GC 5.10, the Contractor shall be permitted to occupy sites where he will be working free of charge from the date of award of the contract up to and including the completion date of July 29, 2016. The sites to be occupied by the Contractor include all the roads and areas specified in this contract and as directed by the Departmental Representative. (see appendix A- site location/ site plan)

.3 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 clean up and any outstanding deficiencies have been addressed to the satisfaction of the Departmental Representative.

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

.1 Owner occupancy.
.2 Work by other Contractors.

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

1.12 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.

1.13 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.

1.14 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.

1.15 SITE ACCESS

.1 Contractor is to limit his laydown area to that indicated on the contract drawings.

1.16 PAYMENT

.1 This is a Fixed Price Contract.

1.17 WARRANTY

.1 All work and materials will be warranted for a period of one year after completion date.

1.18 DOCUMENTS REQUIRED

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

.1 Contract Drawings.
.2 Specifications.
.3 Addenda.
.4 Change Orders.
.5 Other Modifications to Contract.
.6 Copy of Approved Work Schedule.
.7 Health and Safety Plan and Other Safety Related Documents.
.8 Other documents as specified.

1.19 CONSTRUCTION SIGNAGE

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

.2 Signs and notices for safety and instruction shall be 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 RELATED REQUIREMENTS

.1 Section 01 35 00.06 – Special Procedures for Traffic Control.

.2 Section 01 35 43 – Environmental Procedures.

1.2 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 Office-tool trailer may be set up at site.

.3 The Contractor shall keep the Work Site clean and free from accumulation of waste materials and rubbish regardless of source. Snow shall be removed by the Contractor as necessary and at his cost for the performance and inspection of the Work.

.4 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.

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

.6 The Contractor may work from dawn to dusk, Monday to Thursday. There may be restricted hours for work Friday to Sunday.

1.3 ACCESS TO ADJACENT PROPERTIES

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

1.4 SURVEY OF EXISTING PROPERTY CONDITIONS

.1 Submission of tender is deemed to be confirmation that the Contractor has inspected the site and is conversant with all conditions affecting execution and completion of work.

.2 The Contractor shall regularly monitor the condition of the Work Site and of property on and adjoining the Work Site throughout the construction period, and shall immediately notify the Owner if any deterioration in condition is detected. Such monitoring shall cover all pertinent features and property including, but not limited to, buildings, structures, roads, walls, fences, slopes, sewers, culverts and landscaped areas.

1.5 PROTECTION OF PERSONS AND PROPERTY

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

1.6 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.

1.7 SUPERVISORY PERSONNEL

.1 In accordance with Government of Canada GC 2.6 R28Z0D, within five Days after award notification, the Contractor shall submit to the 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.

1.8 MEETINGS

.1 The Work includes attending meetings between the Contractor and the Departmental Representative. The meetings will be called and chaired 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.

1.9 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.

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 00.06 – Special Procedures for Traffic Control.

1.2 DESCRIPTION

.1 Mobilization and Demobilization consists of preparatory work and operations including but not limited to, those necessary for the movement of personnel, equipment, camp, buildings, shops, offices, supplies and incidentals to and from the project site. Mobilization and Demobilization further consists of all traffic control requirements as provided in Section 01 35 00.06 – Special Procedures for Traffic Control.

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 RELATED SECTIONS

.1 Section 01 11 00 – Summary of Work.

.2 Section 01 14 00 – Work Restrictions.

.3 Section 01 33 00 – Submittal Procedures.

.4 Section 01 35 43 – Environmental Procedures.

.5 Section 01 45 00 – Quality Control.

.6 Section 01 52 00 – Construction Facilities.

.7 Section 01 77 00 – Close out Procedures.

.8 Section 01 78 00 - Closeout Submittals

1.2 MEASUREMENT PROCEDURES

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

1.3 COORDINATION

.1 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.

1.4 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.

1.5 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, fences in accordance with Section 01 52 00.

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

.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.

1.6 ON SITE DOCUMENTS

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

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders.

.5 Other modifications to Contract.

.6 Traffic Management Plan.

.7 Safety Plan.

.8 Copy of approved Work schedule and most recent updated schedule.

.9 Notice of Project.

1.7 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.

1.8 CONSTRUCTION PROGRESS MEETINGS

.1 During course of Work prior to project completion, schedule 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.

1.9 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.

1.10 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.

.7 Note that the Departmental Representative will be responsible for preparing agenda for meetings, notification of meeting dates and recording meeting minutes.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 02 81 01 - Hazardous Materials

.2 Section 04 03 06 - Cleaning Historic Masonry

.3 Section 04 03 07 - Repointing Historic Masonry

.4 Section 04 43 01 – Repair Historic Stone

.5 Section 06 20 00 – Finish Carpentry

.6 Section 08 50 51 – Wood Window Repairs

.7 Section 09 03 61 – Exterior Painting

.8 Section 09 24 23 – Portland Cement Stucco

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 General

.1 This Clause identifies the plans, programs, and documentation required prior to mobilization on site and during the construction phase.

.2 Pre-Mobilization Submittals: The Contractor shall not begin any site Work until the 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.

.3 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.

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

.3 Allow 5 days for the Departmental Representative's review of each submission.

.4 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.

.5 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.

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

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

.7 Submissions include:

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

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

.9 Submit 2 prints of shop drawings for each requirement requested in specification Sections and as the Departmental Representative may reasonably request.

.10 Submit 2 copies of 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.

.11 Submit 2 copies of 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.

.12 Submit 2 copies of 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.

.13 Submit 2 copies of manufacturers 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.

.14 Submit 2 copies of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by the Departmental Representative.

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

.15 Submit 2 copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by the Departmental Representative.

.16 Delete information not applicable to project.

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

.18 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.

1.6 SAMPLES

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

.2 Deliver samples prepaid the Departmental Representative.

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

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

.5 Adjustments made on samples by 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 samples, which the Departmental Representative may require, consistent with Contract Documents.

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

1.7 MOCK-UPS

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

1.8 PROGRESS PHOTOGRAPHS

.1 Submit progress photographs in accordance with the Departmental Representative 's instructions

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 Section 01 14 00 Work Restrictions.

.2 Section 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 – 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 – 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.

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.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 14 00 – Work Restrictions.

.2 Section 01 33 00 – Submittal Procedures.

.3 Section 01 35 43 – Environmental Procedures.

.4 Section 01 41 00 – Regulatory Requirements.

.5 Section 02 81 01 – Hazardous Materials.

1.2 MEASUREMENT PROCEDURES

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

1.3 REFERENCES

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

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

.1 Material Safety Data Sheets (MSDS).

.3 Province of Alberta

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

1.4 SUBMITTALS

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

.2 Submit copies of reports or directions issued by Federal or Provincial health and safety inspectors.

.3 Submit copies of incident and accident reports.

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

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

1.5 FILING OF NOTICE

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

.2 Parks Canada recognizes that federal Occupational Health and Safety legislation places specific responsibilities upon Parks Canada as owner of the work place. In order to meet those requirements, Parks Canada has implemented a contractor safety regime to ensure roles and responsibilities assigned under Part II of the Canada Labour Code and the Canada Occupational Health and Safety Regulations are implemented and observed when involving contractor(s) to undertake work in Parks Canada work places, including on Parks Canada property.

.3 After contract award and prior to commencement of any work under the contract, the Project Manager will hold a health and safety meeting with the Contractor. At this meeting, the Contractor is required to complete and sign an Attestation to certify the

Contractor will comply with the requirements set out in the Attestation and the terms and conditions of the contract.

1.6 SAFETY ASSESSMENT

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

1.7 MEETINGS

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

1.8 REGULATORY REQUIREMENTS

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

1.9 PROJECT/SITE CONDITIONS

1.10 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.

1.11 RESPONSIBILITY

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

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

1.12 COMPLIANCE REQUIREMENTS

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

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

1.13 UNFORSEEN HAZARDS

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

1.14 HEALTH AND SAFETY CO-ORDINATOR

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

.1 Have site-related working experience specific to activities associated with earthworks.

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

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

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

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

1.15 CORRECTION OF NON-COMPLIANCE

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

1.16 WORK STOPPAGE

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

Part 2 Products

2.1 NOT USED

.1 Not used.

Part 3 Execution

3.1 NOT USED

.1 Not used.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 02 81 01 – Hazardous Materials

.3 Section 02 83 10 – Lead Abatement

.4 Section 04 03 06 – Cleaning Historic Masonry

.5 Section 04 03 07 – Repointing Historic Masonry

.6 Section 09 91 12 – Exterior Painting

.7 Section 09 24 23 – Portland Cement Stucco

.8 Appendix C – EA Mitigations / Best Practices

1.2 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.

1.3 SUBMITTALS

.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.

.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.

1.4 FIRES

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

1.5 DISPOSAL OF WASTES

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

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

.3 All garbage must be stored and handled in conformance with the National Parks Garbage Regulations.

.4 All surplus and waste materials shall be removed from the job site to approved sites outside of the National Parks. Disposal of all wastes shall be in compliance wit 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.

.5 Dispose of all 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. Take hazardous waste to Class 1 and 2 landfill.

1.6 DRAINAGE

.1 Provide erosion and sediment control plan that identifies type and location of erosion and sediment controls to be provided. Plan: include 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.

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

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

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

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

1.7 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.

1.8 WORK ADJACENT TO WATERWAYS

.1 Do not operate construction equipment in waterways.

.2 Do not use waterway beds for borrow material without the Departmental Representative's approval.

.3 Do not dump excavated fill, waste material or debris in waterways.

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

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

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

.7 Do not blast under water or within 100 m of indicated spawning beds.

1.9 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.

1.10 HISTORICAL / ARCHAEOLOGICAL CONTROL

.1 Provide historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands known to be on project site: and/or identifies procedures to be followed if historical archaeological, cultural resources, biological resources and wetlands not previously known to be onsite or in area are discovered during construction.

.2 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and the Departmental Representative.

1.11 RELICS AND ANTIQUITIES

.1 Artifacts, relics, antiquities and items of historical interest such as cornerstones, commemorative plaques, inscribed tablets and similar objects found on the work site shall be reported to the ESO or the Departmental Representative immediately. The Contractor and workers shall wait for instructions before proceeding with their work.

.2 All historical or archaeological objects found are protected under the National Parks Act and Regulations and are the property of Parks Canada. The Contractor and workers shall protect any articles found and request direction from the ESO or the Departmental Representative.

1.12 NOTIFICATION

.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.

1.13 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.

1.14 CONSTRUCTION SITE ACCESS AND PARKING

.1 In consultation with the Departmental Representative, the Contractor shall formulate an agreement for worker transportation to and from the work sites and where workers shall park their private vehicles. Generally, personal vehicles shall be parked at least 10 metres distance from any watercourse.

.2 The Contractor shall ensure that the environment beyond the work limits is not negatively impacted or damaged by workers' vehicles or construction machinery and shall instruct workers so that the "footprint" of the project is kept within defined boundaries.

1.15 EROSION CONTROL

.1 Erosion control measures that prevent sediment from entering any waterway, water body or wetland in the vicinity of the construction site are a critical element of the project and shall be implemented by the Contractor.

.2 If necessary, on-site sediment control measures shall be constructed and functional prior to initiating activities. If required, the Contractor shall prepare an Erosion Control Plan to the satisfaction of the Departmental Representative and the ESO.

.3 The regular monitoring and maintenance of all erosion control measures shall be the responsibility of the Contractor. If the design of the control measures is not functioning effectively they are to be repaired. The Departmental Representative and ESO also will monitor erosion control performance.

.4 The site will be secured against erosion during any periods of construction inactivity or shutdown.

1.16 POLLUTION CONTROL

.1 The Contractor shall 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.

.2 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.

.3 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.

.4 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.

.5 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.

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

.7 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.

1.17 EQUIPMENT MAINTENANCE, FUELLING AND OPERATION

.1 The Contractor shall ensure that all soil; seeds and any debris attached to construction equipment to be used on the project site shall be removed (e.g. power washing) outside the Banff National Park before delivery to the work site.

.2 Equipment fuelling sites will be identified by the Contractor and approved by the Departmental Representative and the ESO. Except for chain saws, any fuelling closer than 100 metres any streams, wetlands, water bodies or waterways shall require the authorization and oversight of the Departmental Representative.

.3 Mobile fuel containers (e.g. slip tanks, small fuel carboys) shall remain in the service vehicle at all times. Protection and containment of approved fuel storage sites is addressed in # 4 of Pollution Control above.

.4 Equipment used on the project shall be fuelled with E10, and low sulfur diesel fuels and shall conform to local emission requirements. The Contractor is to ensure that unnecessary idling of vehicles is avoided.

.5 Oil changes, lubricant changes, greasing and machinery repairs shall be performed at locations approved by the ESO or the Departmental Representative. Waste lubrication products (e.g. oil filters, used containers, used oil, etc.) shall be secured in spill-proof containers and properly recycled or disposed of at an approved facility. No waste petroleum, lubricant products or related materials are to be discarded, buried or disposed of in borrow pits, turnouts, picnic areas, viewpoints, etc. anywhere within Banff National Park.

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

.7 Fuel containers and lubricant products shall be stored only in secure locations specified by the 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.

1.18 OPERATION OF EQUIPMENT

.1 Equipment movements shall be restricted to the ‘footprint’ of the construction area. The work limits shall be identified by stake and ribbon or other methods approved by the Departmental Representative. Unless authorized by the Departmental Representative, activities beyond the work limits are not permitted. No machinery will enter, work in or cross over streams, rivers, wetlands, water bodies or watercourses, nor damage aquatic and riparian habitat or trees and plant communities. Some of the construction shall require working close to watercourses or water bodies. In these instances, the Contractor is to describe measures to be employed to ensure fugitive materials (e.g. rocks, soil, branches) and especially deleterious substances (e.g. chemicals) do not enter any watercourses, to the satisfaction of the Departmental Representative and ESO.

.2 The Contractor shall instruct workers to prevent pushing, placement, raveling, storage or stockpiling of any materials (e.g. slash, rock, fill or topsoil) in the trees bordering the right-of-way or into watercourses or water bodies.

.3 When, in the opinion of Parks Canada, negligence on the part of the Contractor results in damage or destruction of vegetation, or other environmental or aesthetic features beyond the designated work area, the Contractor shall be responsible, at his or her expense, for complete restoration including the replacement of trees, shrubs, topsoil, grass, etc. to the satisfaction of the Departmental Representative and ESO.

.4 Restrict vehicle movements to work limits.

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

1.19 FIRE PREVENTION AND CONTROL

.1 A fire extinguisher shall be carried and available for use on each machine and at locations within the plant 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 Care shall be taken while smoking on the construction site to ensure that the accidental ignition of any flammable material is prevented. Fires or burning of waste materials is not permitted.

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

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

1.20 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 The Contractor and workers shall immediately report any circumstances related to food/garbage (e.g. overflowing container or strong smell) and wildlife to the ESO or the Departmental Representative.

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

1.21 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 Removal and storage of snow shall be arranged with the ESO and the Departmental Representative.

.3 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.

.4 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.

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

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 Section 01 33 00 – Submittal Procedures.

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 Contractor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by the Contractor.

.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 ACCESS TO WORK

.1 Allow inspection/testing agencies access to Work.

1.7 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.

1.8 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.

1.9 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.

1.10 MOCK-UPS

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

.2 Construct in locations acceptable to the Departmental Representative.

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

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

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

.6 Remove mock-up at conclusion of Work or when acceptable to the Departmental Representative.

.7 Mock-ups may remain as part of Work.

.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 01 11 00 Summary of Work.

1.2 REFERENCES

.1 Canadian Green Building Council (CaGBC)

.1 LEED Canada-NC Version 1.0, LEED (Leadership in Energy and Environmental Design): Green Building Rating System For New Construction and Major Renovations.

.2 U.S. Environmental Protection Agency (EPA) / Office of Water

.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.3 SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.5 DEWATERING

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

1.6 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.

1.7 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.

1.8 FIRE PROTECTION

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

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

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 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 54 23 – Temporary Scaffolding and Platforms

1.2 REFERENCES

.1 Canadian Standards Association (CSA International)

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

1.3 SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

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

.2 Identify areas, which have to be 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.

1.5 SCAFFOLDING

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

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

1.6 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.

1.7 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.

1.8 CONSTRUCTION PARKING

.1 Provide and maintain adequate access and parking at the project site in areas approved by the Departmental Representative.

.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.

1.9 CONSTRUCTION SIGNAGE

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

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

1.10 SECURITY

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

1.11 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.

1.12 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.

1.13 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 Minister.

.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: responsible for repair of damage to roads caused by construction operations.

.7 Construct access and haul roads necessary.

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

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

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

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

.12 Lighting: to assure full and clear visibility for full width of haul road and work areas during night work operations.

.13 Provide snow removal during period of Work.

.14 Remove, upon completion of work, haul roads designated by the Minister.

1.14 CLEAN-UP

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

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

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

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

Part 2 Products

2.1 NOT USED

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 Design, supply, erection, and maintenance of scaffolding to facilitate restoration work, including bracing, tie-backs, outriggers, guardrails, toe boards, platforms, access stairs and ladders.

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

.3 Weather-tight enclosures for scaffolding, as required.

.4 Performance of daily scaffolding safety inspections throughout construction and maintaining 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 DEFINITIONS

.1 The term ***scaffolding***, when used by itself, generically refers to both stationary and suspended (swing stage) scaffolding systems.

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

1.6 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.

1.7 CERTIFICATIONS

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

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

.3 For stationary scaffolding erected over underground parking garage structures, obtain written certification from professional engineer that parking garage structure can support imposed loads.

Part 2 PRODUCTS

2.1 SCAFFOLDING COMPONENTS

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

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

2.2 HOARDING AND ENCLOSURES

.1 Provide posts, rafters, planking and plywood sheathing as required.

.2 Construct roof structure of hoarding with wood framing capable of withstanding impact load from falling debris, materials, or tools in order to provide overhead protection to persons accessing building during construction. Ensure roof of hoarding is waterproof.

.3 Use white-coloured tarps where enclosures will block daylight to occupied units.

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 Position scaffold tiebacks in line with through-wall flashing, if possible. 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 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 identified as being in scope of work.

.4 If necessary, provide sufficient lighting for evening building entry and exit throughout covered walkways to ensure public safety and security. No dark corners are allowed.

.5 Maintain hoarding in good condition at all times.

.6 Repair damaged hoarding to satisfaction of Consultant and other applicable authorities.

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

.8 Keep hoarding clean at all times.

.9 Remove hoarding from site only when authorized by Consultant.

3.4 INSPECTION

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

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

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

.3 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

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

.2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.

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

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

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

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

1.3 AVAILABILITY

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

.2 In event of failure to notify Departmental Representative at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Departmental

Representative reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

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

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

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

.4 Store cementitious products clear of earth or concrete floors, and away from walls.

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

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

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

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

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

1.5 TRANSPORTATION

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

.2 Transportation cost of products supplied by Owner will be paid for by Departmental Representative. Unload, handle and store such products.

1.6 MANUFACTURER'S INSTRUCTIONS

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

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

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

1.7 QUALITY OF WORK

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

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

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

1.8 CO-ORDINATION

.1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.

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

1.9 CONCEALMENT

.1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.

1.10 REMEDIAL WORK

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

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.11 LOCATION OF FIXTURES

.1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.

.2 Inform Departmental Representative of conflicting installation. Install as directed.

1.12 FASTENINGS

.1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, unless stainless steel or other material is specifically requested in affected specification Section.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

.6 Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable.

1.13 FASTENINGS - EQUIPMENT

.1 Use fastenings of standard commercial sizes and patterns with material and finish suitable for service.

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas.

.3 Bolts may not project more than one diameter beyond nuts.

.4 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel.

1.14 PROTECTION OF WORK IN PROGRESS

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

1.15 EXISTING UTILITIES

.1 When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, building occupants, and pedestrian and vehicular traffic.

.2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

Part 2 Products

2.1 NOT USED

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PRECEDENCE

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

1.2 RELATED REQUIREMENTS

.1 Section 01 78 00 – Closeout Submittals.

1.3 INSPECTION AND DECLARATION

.1 Contractor's Inspection: Contractor and all 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

.1 Not Used.

Part 3 Execution

3.1 NOT USED

.1 Not Used.

END OF SECTION

Part 1 General

1.1 PRECEDENCE

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

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 77 00 – Closeout Procedures

.3 Section 04 03 06 Cleaning Historic Masonry

.4 Section 09 91 12 Exterior Painting

1.3 SUBMITTALS

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

.2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.

.3 Copy will be returned after final inspection with the Departmental Representative's comments.

.4 Revise content of documents as required prior to final submittal.

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

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

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

.8 Pay costs of transportation.

1.4 RECORDING ACTUAL SITE CONDITIONS

.1 Contractor to provide as built drawings to Departmental Representative at project completion.

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

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

.1 Field changes of dimension and detail.

.2 Changes made by change orders.

.3 Details not on original Contract Drawings.

.4 References to related shop drawings and modifications.

1.5 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.

1.6 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.

1.7 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.

.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.

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 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 Progress Cleaning:

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

.2 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, with Appendix D – Lead Paint Report and Recommendation, 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.

.2 Appendix D – Lead Paint Report and Recommendation.

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.

.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 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are available for inspection at immediately in Appendix D – Lead Paint Report and Recommendations.

.2 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 the work area has passed a visual inspection for cleanliness - approved and accepted by an independent testing Consultant hired by the Contractor - apply a coat of lock-down agent to surfaces within enclosure, and after appropriate setting period of 8 hours has passed, the independent testing Consultant will perform lead wipe sampling and provide results to the Contractor and to the Department Representative.

.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 INCLUDES

.1 Cleaning of all exposed masonry surfaces. Utilize low pressure hot water and surfactants. Manually scrub with bristle brushes. Complete a test panel for review and approval by the Departmental Representative.

.2 Cleaning of heavy soiling with rotating Vortex pressure spray with water. Complete a test panel for review and approval by the Departmental Representative.

1.2 TEST PANELS REQUIRED

.1 Cleaning Test Panel #1: utilize low pressure water, type 'B' surfactant as manufactured by Chemfax MS Cleaner, and manual brushing.

.2 Cleaning Test Panel #3: Utilize low pressure Vortex water spray with JOS/TORC equipment.

1.3 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures
.2 Section 01 45 00 - Quality Control
.3 Section 04 03 07 - Repointing Historic Masonry

1.4 SAMPLES

.1 Submit samples of all cleaning materials for approval of the Departmental Representative.

.2 Demonstrate all equipment, tools, and plant to be used on site for cleaning operations for approval of the Departmental Representative at commencement of operations.

.3 Use only approved materials and equipment on the job.

1.5 ENVIRONMENT REQUIREMENTS

.1 Do not use any water-based cleaning methods when there is a risk of frost.

.2 Allow at least one month for walls to dry after completion of project before frost risk occurs.

.3 Severe damage to masonry can occur if it freezes when saturated. Heavy walls that have been saturated can take many months to dry thoroughly, and masonry of a porous nature can be drastically weakened by saturation. Careful consideration must be given to timing of any water-based cleaning operations. Statistical freeze-up dates are available from weather offices. Most masonry can be considered dry when its relative humidity is below 25%.

.4 Do not attempt chemical cleaning of the masonry when the temperature is below 10° C.

.5 Most chemical cleaners do not work at temperatures lower than 10° C; if cleaning is attempted below this temperature excessive amounts of chemical would have to be used

and wash down would be prolonged, resulting in damage to the masonry by saturation and abrasion from water spray.

.6 Cleaning should not be done in full, hot sunlight. If necessary, shading of walls is to be provided.

.7 Hot walls cause rapid evaporation of water and solvents; this reduces the contact time of the cleaners, promotes deposition of dirt on cleaned wall areas and reduces the effectiveness of the rinsing procedure.

.8 Effluent from stripping process must be collected in steel drums, sealed and disposed at an approved disposal site. Review procedures with authority having jurisdiction.

1.6 ALTERNATIVES

.1 Unless approved in writing by the Departmental Representative in advance, there must be no changes to the materials, methods, or specified procedures.

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 For most cleaning operations water and dust infiltration poses a serious problem on the work site. It is vital to seal all openings with plastic sheet (6 mil), and caulk around the perimeter of the sheet till a satisfactory seal is established. Close-fitted boarding must then be installed as further protection over the sheeting. Panels should be fixed with non-ferrous screws for easy removal. Protection panels must be installed very carefully, especially when acidic cleaners are to be used.

.3 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.

.4 Water-misting sprays, as noted below, may be required to prevent chemical wind-drift damage to adjacent building finishes and plant material.

.5 Provide protection against the spread of dust, dirt, chemicals, water and residues into the environment at or beyond the work area with an approved enclosure of scaffolding and sheeting, and with water-misting sprays as required.

.6 Extra care must be taken when using chemicals, especially Hydrofluoric Acid cleaners which will etch stained glass and ceramic materials and damage painted architectural metals or nearby stationary vehicles. Pedestrians are susceptible to chemical cleaners and must be protected. Strippable latex-rubber coatings may be required to protect valuable material such as stained glass or historic floor tiles, in addition to the specified sheeting and board coverings. Open ends of scaffolding must be capped to prevent the entry of chemicals; this is to prevent internal corrosion and spillage onto workers taking down tubing.

.7 Rainwater leaders, eavestroughs and gutters should be protected from blockage by residues before work commences. Suitable protection must be installed at drains, but the normal water flow must not be restricted.

.8 Landscape material must be protected from the effects of chemicals, dusts and residues. When chemicals are used, thoroughly pre-soak adjacent shrubs, lawn and plant material and maintain moist conditions by laying soaker hoses to provide a continuous misting of water. Adjacent plant material must be protected from direct contact with chemicals.

.9 When acid cleaners are used lime-filled trenches may be necessary to absorb and neutralize acidic residue and runoff. Similarly, liming of surrounding soil should be established by testing prior to cleaning.

.10 All workmen must be protected from the effects of dusts and chemicals. The contractor must ensure that all workmen wear adequate and approved protective equipment at all times during cleaning operations.

.11 Mask adjacent materials that would be affected by over spray or runoff from chemical or water cleaning action.

.12 Where plinths or band courses need to be protected from runoff, rake out a joint immediately above the courses to be protected, using hand tools, and protect material by providing a apron of 6 mil plastic sheet secured with polyethylene rope and lead wedges set in the chase, and with clips at the lower edge, to deflect runoff.

1.8 EXISTING CONDITIONS

.1 The contractor shall report to the Departmental Representative in writing all areas of deteriorated masonry revealed during cleaning operations.

.2 Areas around severely deteriorated masonry or jointing shall not be cleaned until repairs are undertaken to consolidate the historic material and bring it up to a state where it will withstand cleaning without further damage.

1.9 SCHEDULING

.1 Submit a work schedule indicating proposed timing and extent of work.

.2 Co-ordinate work schedule with that of other trades on site.

1.10 WORKMANSHIP AND QUALIFICATIONS

.1 All work shall be carried out by competent workmen who are trained and experienced in this type of work.

1.11 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with the Departmental Representative's instructions.

Part 2 Products

2.1 WATER

.1 All water shall be potable, clear and free of contaminants. Water with a high iron level shall be treated before use to reduce iron content.

.2 Care should be taken when washing carbonate-based masonry such as limestone and marble with acidic water. Basic and hard water clean this class of masonry more satisfactorily because of the retarded cleaning action.

.3 All piping and fittings for cleaning operations should be plastic or non-ferrous material to minimize rust staining of masonry.

.4 Water pumps shall be fitted with accurate pressure regulators and gauges that are capable of being preset and locked at maximum specified levels. For most work specified herein a maximum working pressure of 20 psi at 4 gpm (1.3 Mpa at 18 1/m) is called for.

.5 Low or mains pressure is regarded as around 50 psi; medium pressure cleaning is 100 - 200 psi; even at this pressure, which is considered quite low by industry standards, considerable damage can be done to softer stones and bricks. Above 200 psi water acts as an abrasive on soft sedimentary stones, and must be used with extreme caution on very hard stones and polished hard surfaces such as granites.

.6 Steam is to be generated in flash boilers or other suitable approved appliance.

2.2 AIR

.1 Pressurized air is to be clean and free from oil or other contaminants.

.2 An on-line oil filter with a manual drain and pressure control gauge at the working face must be fitted to all air lines.

.3 Oil droplets sprayed onto a building at high pressure can be difficult and costly to remove. Air pressure must be regulated at the work face to compensate for drops in pressure along the line.

2.3 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 Ferrous metal brushes and tools have iron particles in masonry that cause rust staining.

.4 Low pressure Vortex spray with mixture of air, fine inert granulate and water - JOS/TORC system as supplied by Stonehealth Conservation & Restoration, England. Phone (+44) 01453 540600.

2.4 SURFACTANTS

.1 Surfactants shall be of the non-ionic type for general masonry cleaning. Utilize Chemfax MS Cleaner - Chemfax Products Ltd, Calgary.

.2 Surface-active agents are used to dislodge minute insoluble particles that are tightly held to the masonry surface by molecular attraction, and allow the particles to be flushed away. Surfactants can be used alone with water in concentrations of 1 - 2% (by weight or volume), or in lesser concentrations as part of formulations with acidic, neutral or

alkaline bases. Most patent cleaning formulations contain surfactants. Detergents and soaps are surfactants. There are three types of surfactants available:

.1 Anionic Soaps and Detergents - these products require high temperatures and soft water to work effectively. They react with magnesium, calcium and iron ions to form soap curds that are difficult to remove. Most generally available detergents are of this type, and are generally not suitable for masonry cleaning.

.2 Non-Ionic Detergents - can be used with hard water at low temperature, often combined with thickeners to improve the cleaning action. Alkyl-ethylene-oxide type detergents are satisfactory for masonry cleaning in general.

.3 Cationic Cleaners - such as long-chain or fatty amines are not good general cleaners. They should not be combined with anionic cleaners as they form insoluble precipitates when combined. They are useful in acidic formulations to remove bacteriological slimes and in disinfection work. Quaternary ammonium salts can be utilized for this cleaning operation.

2.5 ACIDIC CLEANERS

.1 Only formulations based upon hydrofluoric acid (HF) should be used for cleaning acid-resistant historic masonry. A maximum concentration of 5% HF acid should be used.

.2 HF acid is the only acid that does not form dangerous soluble salts during the cleaning process. Formulations based upon hydrochloric acid (muriatic acid - HCl) should not be used. Many secret formulations are HCl-based. The formulation of hygroscopic iron chloride compounds can result in severe staining of the surface of the masonry and crystallization in the structure of the masonry, exerting considerable pressure that can be quite destructive of weak or fissured material.

.3 A small amount (approximately 0.25%) of orthophosphoric acid should be added to the compound to minimize metallic salt deposition at the surface of the masonry.

.4 Orthophosphoric acid acts as a chelating agent that sequesters metallic ions and transforms them into insoluble complexes. Thorough washing and maintenance of a constantly wet face on the masonry prevents deposition of these products on the masonry.

.5 A quantity of non-ionic surfactant may be added to most cleaners to act as a wetting agents.

.6 CAUTION: Ammonium bifluoride is not an all purpose cleaner and should not be used on calcareous materials. It is an acidic salt that produces HF acid and free ammonia along with sparingly soluble calcium fluoride. This tends to lighten the colour of the masonry and may leave deposits of ammonium salts which may lead to deterioration of the masonry. This product may be used in some circumstances where these effects are not a problem, but only after testing and with extreme caution.

2.6 INORGANIC SALTS

.1 Sodium hexametaphosphate (Calgon, or NaHMP) is an effective, neutral agent able to dissolve gypsum-bound soiling on masonry. This cleaner requires a long contact time

with soiling to effectively break down the gypsum, and is usually combined with either basic or acidic compounds and surfactants to improve the cleaning action.

.2 A solution of 5% NaHMP, 0.25% ammonium formiate, 0.05% surfactant and ethanol amine to pH 9 is an effective gypsum solubilizer for use on limestone, and is combined with either a thixotropic gel or used with a recirculation system to give a long contact time with the masonry.

2.7 ALKALINE CLEANERS

.1 Ammonium hydroxide (ammonia) is a satisfactory alkaline cleaner that is safe for use on calcareous materials. Complexing agents and organic bleaches are added to give a more even final appearance to the masonry. Foaming surfactants are necessary to hold the ammonia in solution during cleaning operations.

.2 Many commercial alkaline cleaners and paint strippers are based upon sodium hydroxide (caustic soda). These should not be used on friable, weak or historic masonry because of the quantity of soluble salts that are deposited on the masonry causing destructive inflorescence and subsequent stress and decay.

2.8 ORGANIC SOLVENTS

.1 Two different types of organic solvents are available for cleaning purposes: petroleum-based solvents and synthetic solvents. Xylene, toluene, and benzene, all petroleum-based, are useful in breaking down oils and paints. Xylene is safest, toluene is more volatile and benzene is highly toxic and carcinogenic. All are flammable. Special solvents are available with high flash point such as Stoddard Solvent (380 C) and 60 C Flash Point Solvent. These do not volatilize appreciably at temperatures below their flash point and are therefore useful for poultices and gels. Synthetic solvents are mainly chlorinated hydrocarbons similar to those used for dry-cleaning solutions. These are quite poisonous and must be used with care. They are, however, non-flammable. Perchlorethylene (C2C14) is an example of a common synthetic solvent. There are many solvents available, each with its own particular qualities.

2.9 POULTICES

.1 This is a general guide to poultices; each potential application will require appropriate testing.

.2 The poultice medium should be an inert, porous material with a large surface area. Diatomaceous earth (swimming-pool-filter medium) is a readily available material. Talc and chalk could be used. It is generally mixed with a binder such as clean acid-free cotton waste that holds the paste together as it dries. Paper pulp could be used if clean and acid-free.

.3 A liquid carrier is required to dissolve the stain and carry it out of the masonry into the medium. Water is used for most chemical poultices but organic solvents are required for stains soluble only in solvents. Glycerine is used as a thickener to slow down the rate of evaporation; it sometimes improves the cleaning action of certain chemicals and surfactants.

.4 A support mechanism is required for heavy poultices to stop them falling away before the pack is completely dry. A non-ferrous or suitable plastic expanded mesh is used; it can be held against the wall with non-staining fasteners.

.5 Copper stains on siliceous material can be treated with a 10+% solution in water of sulfamic acid in a poultice pack. Copper stains on carbonate material can be treated with a 2-5% solution of ammonium carbonate in water in a poultice pack.

.6 Iron stains on siliceous material can be treated with a solution of orthophosphoric or oxalic acid, 10% by weight, and sodium salt of EDTA (ethylene diaminetetra acetic acid), 2% by weight in water. Mix into a paste poultice. Iron stains on carbonate materials can be treated with a 15% solution of sodium citrate in water, mixed 1:1 with glycerine and worked into a poultice paste.

.7 Oil and grease stains on marble can be treated with ammonium hydroxide and water in a poultice. Identify marble type and composition before general application.

.8 Heavy grease stains can be removed with a combination of petroleum solvent (20% by volume), chlorinated hydrocarbon solvent (10%) non-ionic surfactant (2%), and water (68%) mixed into a poultice.

.9 All cleaning compounds must be tested on a small area of the masonry before use.

2.10 GRINDING EQUIPMENT

.1 Grinding wheels, pneumatic hammers and chisels, and rotary teeth-grinders are NOT acceptable, and must not be used.

2.11 HEAT CLEANING

.1 Open flame heat lances and high temperature heat guns must not be used to clean historic masonry.

.2 Heat-lances used to remove or soften soiling set up considerable strains in the surface of masonry from rapid temperature differential, that lead to spalling of the surface on most materials.

2.14 BRUSHES

.1 Fibre bristle brushes only.

Part 3 Execution

3.1 PREPARATION FOR ALL METHODS

.1 Seal, pack with removable masking, or repair all defective jointing and other openings in the work area to minimize water, dust or solvent infiltration of the masonry wall.

.2 Dry brush and if necessary scrape all large accumulations of foreign matter from walls, ledges, cornices and the like. Use moderate pressure (50 psi) dry air blasts to remove as much loosely attached soil and dust as possible before commencing main cleaning operations. Care must be exercised when blasting around decorative material or extremely friable masonry.

3.2 MASONRY

.1 Wet the masonry surface soiling by soaking with a low-pressure misting system to swell and loosen soiling.

.2 Use as little water as possible; the soiling needs only to be kept moist. Avoid excessive wetting and soaking of the masonry.

.3 The time required for this operation varies considerably with the type and degree of soiling, but generally anywhere from a day to several weeks of misting is required.

.4 Use nozzles that give a nebulized droplet spray.

.5 Hand or automatic time controls can be used to provide a few seconds of spray every few minutes, depending upon the temperature, exposure and relative humidity. Nozzles can be secured to scaffolding to provide even positioning over a section of a wall. Additional nozzles should be positioned to get at heavily soiled areas under cornices and behind carved areas.

.6 Heavily soiled areas will require proportionately more soaking time than cleaner open areas.

.7 Running streams of water down wall elevations and excessive soaking of masonry is not recommended as these can cause infiltration of the wall assembly, with subsequent damage to insulation, wood framing, plaster and paint work. Insoluble salts can also be brought to the surface, causing staining and severe efflorescence; and movement of metallic ions to the surface can cause staining of the masonry. Concealed iron fittings and structural components can be seriously damaged by prolonged wetting of masonry, leading to spalling, severe staining of masonry, and structural damage. Avoid steel or iron pipes and spray heads/nozzles. General use of plastic piping and fittings is recommended.

.8 Strongly acidic water should not be used on carbonate material such as limestone, calcareous sandstones, or marble.

.9 Acidic water (or cleaner) have a rapid dissolving action on carbonate material. This can result in pitting of masonry behind resistant soiling when long periods of soaking are involved. Lime mortars are similarly affected.

.10 The details of the setup of equipment, incorporation of other related and approved cleaning methods, and degree of cleaning to be achieved should be determined at the beginning of the job during the test patch operations.

.11 Excessive cleaning of masonry or absolute insistence of an even cleaning result over all areas and types of material is not desirable. Old masonry must not be cleaned to a 'like-new' condition. Many materials develop a patina that should not be confused with built-up dirt or soiling, and that should not be removed.

.12 Brushing of heavily soiled areas with natural bristle or nylon brushes and scraping with wood or plastic tools can assist in loosening deposits and improve the action of the water misting. Considerable effort may be required with certain stains, but at all times care must be taken not to harm the worked surface of the masonry.

.13 A final rinse-down with a pressurized water spray is to be done when the soiling reaches a state that allows easy removal without overworking of the masonry surface with the gun and without damaging the masonry.

.14 Maximum water pressures should be carefully determined and controlled to prevent damage. Normally, pressures up to 200 psi at 4 gpm (1.3 Mpa at 18 1/m) are adequate to remove loosened soiling on masonry. Hard materials such as dense concrete, granites and structural glass can withstand pressures up to 600 psi at 10 gpm (4 Mpa at 45 1/m) without damage. Higher pressures are suspected as they act like abrasive blasting operations, wearing away, cavitating and pitting the surface of less durable materials. At high pressures water is driven deep into the micro- and macro-fissures of the masonry, subjecting the material to considerable internal stress.

.15 If soiling is strongly bound with siliceous material, removal of soiling with water alone will be nearly impossible. Non-calcareous or unpolished materials might respond to acidic cleaning to breakdown the binder, in combination with water washing.

.16 Acidic washing etches all surfaces to differing degrees: the cleaning action is based on the dissolving of a thin surface layer of material to loosen the soiling. Heavily soiled calcareous masonry under mouldings or cornices may require touching up with a low-pressure abrasive blast system. This must be done with caution and only as a last resort.

3.3 STEAM CLEANING

.1 Pre-soaking with water and treatment with surfactants before steam cleaning will improve the rate and quality of cleaning.

.2 Steam cleaning is also useful in removing deep-seated soiling after acid cleaning.

.3 The same precautions against frost damage and provisions for dry-out times are to be observed as for water cleaning.

.4 Gypsum-bound soiling will respond better to cold water treatment than to steam or hot water cleaning methods. Silicate-bound soiling will only respond to chemical pretreatment prior to steam cleaning.

.5 Steam is transmitted to a lance which is held by an operator a short distance from the object to be cleaned.

.6 Water is normally boiled in a flash-boiler at grade and the steam is compressed and run to the work face by a system of pipes.

.7 For work on historic masonry a 1/2" (12 mm) nozzle is used at a working pressure of between 20 - 50 psi (0.14 - 0.34 Mpa). Consideration must be given to drop in pressure in the line between compressor and work face. Harder stones and sound polished surfaces can be cleaned with nozzle pressures of up to 200 psi (1.4 Mpa) if testing determines that no damage occurs at these pressures. Normal high-pressure steam cleaning at around 500 psi (3.4 Mpa) must not be carried out on historic masonry.

.8 For greasy soiling on calcareous stones a working time of about one minute per square foot of surface should be adequate. Heavily soiled carved work will require considerably

more time. Heavy soiling should be agitated by hand brushing to assist in the steam cleaning action.

.9 Steam cleaning is an extremely dangerous operation for the workmen and considerable care must be taken in providing adequate protective equipment and proper access/scaffolding.

3.4 SURFACTANT CLEANING

.1 Surfactants are usually combined with other methods of wet cleaning to assist in overcoming the surface attraction that exists between soiling and the masonry. Surfactants can be successfully used alone with medium-pressure water washing on polished surfaces, glazed brick and glazed terra cotta. Soiled masonry can be pre-soaked as specified in Part 3.2 (Water Cleaning) to swell and soften the soiling and dirt deposits.

.2 A 1 - 2% solution of surfactant in water is brushed on or sprayed at low pressure onto the masonry surface. A thick lather is formed which is brushed into the masonry to loosen and remove the soling.

.3 The masonry is then rinsed down with water at a maximum pressure of 200 psi at 4 gpm (1.3 Mpa at 18 1/m) to remove all surfactant. Repeat as required.

3.5 ACIDIC CHEMICAL CLEANING

.1 Do not use acidic cleaners on calcareous materials such as limestone, calcareous sandstone or marbles, or on glazed or polished surfaces such as glass, glazed terra-cotta, glazed brick, polished granite and the like.

.2 Test all materials to be cleaned for reactivity with acidic cleaning compounds. A simple test is to apply a few drops of muriatic acid (HCl) on the masonry. If it bubbles or foams up the surface is most likely calcareous. Alternative cleaning methods must be used. Acidic cleaners can cause considerable damage to lime-based mortars and pointing.

.3 Do not attempt acidic chemical cleaning at temperatures below 10 C.

.4 Hydrofluoric acid based cleaners do not work well below this temperature. Excessive amounts of chemical are required and proportionately greater rinsing is necessary, resulting in a greater chance of damage to the masonry face and jointing.

.5 Ensure that all adjacent surfaces are adequately protected from acid and rinse water. Guard against seepage, wind drift, and corrosion of scaffolding and swing-stage equipment. All glazed or polished surfaces adjacent to the work area must be protected from any contact with the acid cleaner. Hydrofluoric acid compounds will severely etch and stain these surfaces.

.6 All glazed areas should preferably be masked with both a strippable latex rubber spray and plastic sheeting covered with close-fitted boarding. The perimeter should be caulked to prevent seepage. This is especially important when dealing with stained glass or vitrified floor tiling.

.7 Special protective measures should be taken to ensure that workmen are protected from and are aware of the dangers of working with Hydrofluoric acid based cleaners.

.8 HF acid causes severe and slow-healing wounds that can be extremely dangerous.

.9 Pre-wet all masonry to be cleaned down to grade until the wall remains wet and water begins to flow down the wall.

.10 Cut 5% working solution 1:1 with water (add acid to water) to give 2.5% working solution; cut again 1:1 to give 1.25% solution. Test for effectiveness of weakest possible solution first.

.11 Apply cleaning solution from the bottom of the wall and work up the wall. Apply with either brushes or low-pressure spray system.

.12 Start at bottom to minimize re-deposition of cleaning residue on the wall face. This is a common cause of staining. Do not use a stronger chemical concentration than is absolutely necessary; rather, repeat the process with same concentration to achieve further cleaning effect.

.13 Follow manufacturer's recommended dwell times for particular concentrations but allow cleaning solution to remain on the masonry a maximum of ten minutes only. Ensure that wall surface remains wet. Rinse the wall from the BOTTOM and work up. When at the top rinse back down to grade. Allow to dry, and evaluate the cleaning action and any damage to masonry or pointing.

.14 Repeat process from step 5. as required.

.15 If, after drying, a whitish bloom is evident on brickwork, treatment with a weak acid cleaning solution and rinse down after complete drying of the wall should eliminate the problem.

.16 The whitish deposit is usually an amorphous silica residue that is a product of the dissolving action of the acid on the masonry.

.17 At midday break in work and at end of work day, wash down all wall areas being cleaned to remove all traces of acid. Check pH of wall to ensure neutrality.

3.6 ALKALINE CHEMICAL CLEANING

.1 Sodium hydroxide-based alkaline cleaners are not recommended for use on historic masonry of any kind.

.2 On some sound calcareous material that have been painted or are impregnated with waxy deposits, sodium hydroxide cleaners may be appropriate. The surface must be thoroughly rinsed down with a weak acetic acid solution to neutralize the base, followed by rinsing with water.

.3 Ammonium hydroxide can be used in solution with surfactants to provide an effective and relatively safe cleaning compound for use on calcareous stone.

.4 Soiling on calcareous material is usually bound to the surface with a deposit of gypsum. It is necessary to dissolve the gypsum binder to loosen the dirt particles and clean the masonry. A method currently under test in Sweden is to use sodium hexametaphosphate (NaHMP) either in a inverting (thixotropic then water soluble) gel or with a re-circulating spray system followed by a water rinse.

.5 For a gel: the wall is pre-wetted with water spray and the cleaner is sprayed onto the masonry and left to react for a period of about 5 to 30 minutes. The wall is then rinsed down with a medium pressure water spray (maximum 200 psi at 4 gpm).

.6 For a circulating spray: the cleaning solution is substituted for water in a misting spray system and re-circulated over the face of the wall until the desired degree of cleaning is achieved. The solution is collected in a plastic-lined gutter formed at the base of the wall and pumped to the top of the spray system. Similar precautions as with a water spray system must be observed. Rinse with water upon completion to remove all chemical traces.

3.7 ORGANIC SOLVENTS IN GELS AND POULTICES

.1 Organic solvents are employed to breakdown soiling that is soluble only in non-aqueous liquids; paint, grease, oils, waxes, tars, resins, some adhesives, rubbers, certain gums and lacquers, varnishes and plastics. Once broken down these soils can be emulsified with a surfactant and rinsed away with water.

.2 Proprietary methylene chloride base paint strippers in a gel form can be used to remove difficult organic stains in combination with other methods.

.3 Organic solvents are usually used with pastes, gels or poultices to minimize soaking and thus minimize transfer of soiling deeper into masonry.

.4 Paint stripper is brushed onto the soiled masonry and allowed to react for about 10 to 15 minutes. After this time most of the useful solvents are volatilized and the solvent is either re-applied or rinsed off with water and surfactant. A rinse-off pressure of 100 psi at 4 gpm (0.6 Mpa at 18 1/m) should be the maximum permitted to minimize damage to the base masonry. Hand scrubbing with soft brushes may be necessary.

.5 High pressure rinse-off acts like sandblasting and leads to cavitation of the surface.

.6 Prepare a suitable poultice paste using solvents and chemicals mixed with water and glycerine (a thickener) appropriate to the nature of the soiling.

.7 Small areas of masonry that are badly stained with material responsive to organic solvent can be treated with poultices. Suitable solvents and chemicals are mixed with an inert medium to form a thick paste. A binding agent such as cotton waste (acid-free) can be added to prevent cracking and premature dislodgment of the pack from the masonry.

.8 Pre-wet the stain area with chemical mixture only; remove as much built-up excess soiled material as possible with scrapers and absorbent material.

.9 Trowel on a 1/2" (12 mm) thick layer of paste over the stained area. Hold the paste in place with a non-ferrous mesh. Cover the pack with plastic sheeting that is neutral to the paste for a few hours to limit initial evaporation and promote dissolving of the stain. Then remove plastic sheeting and allow the pack to dry out in place. This may take up to a week.

.10 Remove pack carefully and brush area clean. Dispose of waste pack material. Repeat as required. Several applications will probably be necessary.

.11 Test cleaning action of solvents and chemicals for damage to surfaces before commencing operations. These methods can be quite drastic for use on friable masonry and great care should be exercised. It is far better to use quite weak solvent and chemical concentrations several times than to risk damage from concentrated chemical solutions. Biodegradable paint strippers are currently under development by some manufacturers to help reduce health hazards and environmental problems encountered with present products.

END OF SECTION

Part 1 General

1.1 SCOPE OF WORK INCLUDES

.1 Mortar to be of intermediate strength - designation 'iii'. Joints to match existing; deep recessed, concave joint.

1.2 RELATED WORK

.1 Section 01 33 00 - Submittal Procedures
.2 Section 01 45 00 - Quality Control
.3 Section 04 03 06 - Cleaning Historic Masonry

1.3 QUALIFICATION

.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. Acceptable stone masonry firms: I.B. Jensen Masonry, G&A Masonry, Gracom Masonry, and Oskar Masonry.

.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.

1.4 TEST PANEL

.1 Before commencement of work the contractor shall complete a 1 m^2 test panel demonstrating all aspects of the repair procedure

.2 The panel(s) shall be located as directed 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 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 Store cementitious materials in accordance with CSA A5. Store aggregates in accordance with CSA A23.

.2 All materials are to be kept dry and protected from weather and contamination. Masonry units are to be stacked on pallets.

.3 Manufacturer's labels and seals must be intact upon delivery.

.4 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 above $4^{o}C$ ($40^{o}F$).

.2 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. Repointing must not be done at temperatures above $27^{o}C$ ($80^{o}F$) unless shading and water-misted burlap over new work is provided.

.3 All work must be suspended during frosty weather unless a heated enclosure is provided. 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 may be necessary 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.

.4 All newly laid masonry mortar shall be protected against freezing until it is set and dry.

.5 The initial set of lime putty takes at least three days; mortar should be allowed to dry out slowly after this time. Enclosure and temporary heating may be required to prevent freezing.

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 Provide and maintain protection for masonry walls at all times when work is suspended to prevent water from entering partially re-pointed masonry.

.4 Protection shall consist of non-staining plastic sheets, tarpaulins or burlap, secured to prevent lifting in high winds.

.5 Provide protection boards to exposed corners, vulnerable decorative work 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.

.6 Rainwater leaders, eavetroughs and gutters 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.

.7 Provide protection against the spread of dust, debris and water at or beyond the work area by suitable enclosures of sheeting and tarpaulins.

.8 Prevent the entry of dust, debris and water into the building by sealing all openings.

.9 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.

1.10 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with the Departmental Representative's instructions.

Part 2 Products

2.1 WATER

.1 Water shall be potable and free from contamination.

2.2 CEMENT

.1 Cement shall be white Portland cement.

.2 Low-alkali cement is preferred. Gray Portland cement, though less expensive, is not suitable for use on historic masonry because of the high content of soluble salts that cause staining, efflorescence and crystallization stresses in weak masonry, salts such as sodium and calcium sulphates and hydroxides, and sodium silicates. Gray Portland cement that includes hydrated lime and cement in a pre-mixed state may be suitable, provided that the ratio of mix constituents conform generally to those established in table 3.6.1. Its use is suggested where excessive moisture in masonry is a problem.

2.3 LIME

.1 Hydrated lime to ASTM C207-79 (1984).

.2 Lime putty slaked from fresh quicklime produces a superior, stronger mortar with greater plasticity and workability than putty run from hydrated lime (CSA A82).

2.4 PIGMENT

.1 Pigments shall be dry, powdered, inorganic pigments, such as manufactured by Northern Pigment Ltd., Toronto, Ontario acceptable alternate.

.2 Pigments have traditionally been made by heating various natural earth and metal oxide compounds to achieve various colours. Ochre, sienna and umber are examples of natural earth pigments. Yellow, brown and red tones are produced by heating iron oxides. Most pigments tend to fade under UV exposure.

2.5 AGGREGATE

.1 The aggregate shall be a well-graded washed sand matching the texture and range of sizes found in the mortar to be matched. The colour of the sand shall be an exact match of the original; a blending of sands may be required where appropriate. The colour of the mortar should ideally be achieved through the sand only.

.2 The sand should contain a full range of sizes from fine to quite coarse. Asphalt sand is a readily available grade that gives such a range. Brick sand is generally too homogeneous in grade size. The addition of pigments for special effects is normally restricted to tuck pointing, sand being the general colouring agent.

2.6 BONDING AGENT

.1 Bonding agents should be used with caution: synthetic admixtures can cause the formation of soluble salts, and increased shrinkage through the added water. Utilize pure acrylics such as Acryl 60 (Thorosystems Ltd.) or equivalent. Polyvinyl acetate (PVA) type, which breakdown under ultraviolet exposure, is not acceptable.

2.7 POWER EQUIPMENT

.1 Where allowed, a power reciprocating masonry saw may be used to remove the existing mortar joint. Acceptable equipment includes: Arbortech AS170.

Part 3 Execution

3.1 PREPARATION OF HYDRATED LIME

.1 Putty can be made from hydrated mason's lime by adding dry bagged hydrated lime to water. The mass is stirred and hoed to form a thick cream. Allow to stand at least 24 hours before use - preferably longer.

.2 Hydrated limes are produced from quicklime by the addition of a limited amount of water. The resulting dry powder is bagged. Dolomitic Finishing Hydrated Limes (Type S) develop superior plasticity than Mason's (Type N) Hydrated Limes. It is very important that quicklimes be fully slaked, as any unslaked particles will subsequently expand and disturb the rest of the work. It is for this reason that all putty be allowed to temper for at least two weeks before use.

3.2 PREPARATION OF ROUGHAGE

.1 If the contractor desires, the lime and aggregate may be pre-mixed to produce what is known as roughage or coarse-stuff. This compound may be stored indefinitely if kept sealed from air and kept from freezing.

.2 Lime hardens slowly through the absorption of carbon dioxide (carbonation), in contrast to hydraulic cements that set quickly through a reaction with water.

.3 The sand and lime should be accurately proportioned using measuring boxes constructed to contain the exact volume of each ingredient required to make one batch. These materials are to be thoroughly mixed in a mechanical mixer for about ten minutes, then stored in plastic-lined drums and sealed until required.

.4 When required for use the correct portion of gauging cement should be added, and the mix worked up as specified and used immediately.

.5 As the strength and colour of even slightly different mixes varies dramatically, accurate portioning is a strict requirement of this specification.

3.3 CEMENT GAUGING OF MORTARS

.1 The addition of hydraulic cements to lime and aggregate mixes must be done immediately before the use of the mortar.

.2 All mortar must be used within two hours of gauging; do not re-temper mortars after this time has elapsed.

.3 All batching is to be done with wooden boxes or plastic pails of known volume to ensure standardization and conformity of measurement. 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.

.4 Initially, mortars should be mixed for five minutes without cement or the addition of water. Careful addition of a small amount of water should produce a mortar that is just wet enough to hang on a trowel. Excess water creates a shrinkage problem, and water content in excess of 5% will retard carbonation significantly.

.5 Cement should be added and mixed for about two minutes before use.

.6 The amount of water required should be recorded and added at the start of mixing for future batches.

.7 Mortars must be mixed a total of at least 10 minutes before using to improve wearability, increase air entrainment and plasticity, and ensure thorough mixing.

.8 All mixing boards and mechanical mixing machines must be cleaned between batches.

.9 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.

3.4 MIX FORMULAE

.1 (The appropriate mix formula to be selected by the Departmental Representative.)

Mortar Designation	Cement: Lime Aggregate	Masonry Material	SELECTED EXPOSURE Sheltered	Moderate	Severe
ii	1:1/2:4-4 1/2	Highly durable: granite, hard brick, etc.	iv	iii	ii
iii	1:1:5-6				
iv	1:2:8-9	Moderately durable: stones, bricks, etc.	v	iv	iii
v	1:2:10-12				
vi	0:2:5	Poor durable: soft brick, friable stone, etc.	vi	v	iv

.2 The mix recommendations are conservative; old, valuable masonry should be re-pointed with a mix one grade weaker than that shown.

.3 For repointing of smooth, hard materials such as polished granite the mix water should be replaced with a 1:1 bonding agent: water solution, to improve edge adhesion.

.4 Addition of a bonding agent is not recommended for softer masonry as the strength of the mix is increased substantially and an excessive concentration of salts may be formed in the mortar.

.5 These formulae are based upon the use of lime putty and white Portland cement. The use of lime-based mortars requires considerable skill on behalf of the mason to produce first-class work.

.6 Lime-based mortars are extremely slow setting, progressively developing strength over several months. The initial set of the lime takes about three days under good conditions.

.7 The small amount of white Portland cement provides a fast initial set to the mix; it requires however, a moist cure for about two days to achieve a reasonable strength. After this time the masonry should be kept quite dry, to assist in the carbonation of the lime.

.8 Carbonation requires the entry of carbon dioxide gas in air to enter the mass through the porous structure of the mortar and masonry. Heavy buildups of mortar should be avoided if possible; where deep, thick joints are necessary the backup mortar should be mixed with an aggregate of broken, porous brick chips or other suitable material to aid in the aeration of the mass. They should be added to the mix just before placement. The

presence of large amounts of water in the masonry hinders carbonation by filling the pores and preventing access of carbon dioxide to the interior.

3.5 COLOURING OF MORTARS

.1 If it is necessary to match existing coloured mortar, samples of freshly-broken mortar from the original masonry pointing must be obtained.

.2 All matching must be done with unweathered samples of mortar to determine the exact colour used. Final shading to match adjacent weathered mortar can be obtained by using less colourant in many instances. Soiled mortar should not be used as a match, because if the soiled mortar is cleaned at a later date, any new repairs will show up as dirty. The overall colour of mortars should come from the aggregate, not the binder. As mortars weather, the aggregate is gradually exposed and etched, and becomes the principal element affecting the overall colour.

.3 A test patty of mortar must be prepared, accurately proportioned to represent the final mix formula and amount of pigment.

.4 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.

.5 No more than 10% by volume of pigment shall be added to mortars.

.6 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.

.7 Suitable pigments to obtain certain colours are suggested below. The exact amount of each pigment to match existing samples must be determined by experiments.

Yellow-Beige	Sienna
Brown-Beige	Brown Umber
Red-Terra-Cotta	Burnt Sienna - Brown Umber
Limestone	Bone Black - Brown Umber
Gray Sandstone	Green Umber

3.6 METHOD OF CUTTING-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 A great deal of damage can be done to masonry in a short period of time by inexperienced workmen. Often this damage is irreparable, resulting in the loss of historic material. The use of students and untrained laborers for this operation is not acceptable.

.3 All cutting-out of joints is to be done with hammer and chisel, unless otherwise specified herein.

.4 Cutting out of head joints is to be by hand only. Power chisels, power saws and angle grinders are not acceptable. Head joints rarely cut out properly with power saws, and

often the adjacent units are badly chopped or cut. All pricing of work should be based upon hand cutting fort head joints.

.5 Cutting out of horizontal joints may be completed with reciprocating saws and angle grinding wheels under the following conditions:

.1 All work is to be done under the direct supervision of the foreman.

.2 Angle grinders may be used only to score one cut in each joint at the centre of the joint; the cut is to be no more than one half the width of the joint, and cut to the full depth of the joint required.

.3 The face edges of the stone are to be cleaned up on the bench after the stone is removed from the wall.

.6 It is practically impossible to remove hard Portland cement-based mortars from masonry by hand-chiseling, but with care a satisfactory result can be achieved with mechanical cutting equipment as an aid. Great care must be taken so as not to damage masonry units adjacent to joints.

3.7 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.

.2 Pointing is to be build up in layers not exceeding 12 mm in depth; the bottom layers must be allowed to set before subsequent layers of mortar are applied.

.3 After the final layer of mortar has set the joint is to be tooled lightly to give the final required form. Do not overwork the face of the joint. Head joints must be tooled first.

.4 All masons are to use identical jointing tools.

.5 Joints are to be tooled behind the face of the masonry units to match the weathered joints.

.6 It is strongly recommended that joints be matched with a slightly recessed joint, tooled flat or slightly concave. This allows the front edge of the masonry units to stand clear of the jointing mortar, and not be covered with excess mortar. The matching of adjacent mortar is easier using this method of finishing the joints, and it offers the additional benefit of relieving the stress on the outer edges of the masonry units. Stipple the joint with a stiff brush to give a textured, weathered appearance; this compacts the joint and removes laitance (the superficial accumulation of fine particles).

.7 All excess mortar must be removed from the face of the masonry before it sets, and the jointing neatly finished as specified.

.8 Several types of tooled finishes are possible:

.1 Struck-flush - this is formed as the work proceeds by pressing with the trowel the wet mortar that protrudes beyond the face, flat and flush with the wall. The edges are then neatly trimmed.

.2 Flat-jointed - as above, but with the addition of a semi-circular groove run along the centre of the joint with a finishing tool and straight-edge. Sometimes called grapevine jointing.

.3 Keyed/Concave - struck flush, then finished with a curved tool slightly wider than the joint, forming a dense concave joint.

.4 Recessed - formed by raking back the mortar about 10 mm to give an even shadow line.

.5 V-joint - struck flush, then finished with a v-shaped tool run along the face edges of the units.

.6 Raised - formed to protrude beyond the face of the unit, occasionally bevelled top and bottom to form an inverted "V".

.7 Tuck-pointed - consists of filling a previously raked-out joint flush with mortar and evening out any irregularities in the masonry. The entire face of the wall is rubbed with a soft flat brick after being coloured with brick dust to hide the wet joints. White lime putty is pressed against the joint in straight lines with a jointer template run on a straight-edge. Before the edges are removed the putty edge is trimmed with a 'Frenchman', a knife-like tool with a bent edge. A raised white joint about 6 mm wide and 2 mm thick is left on the face of the work. Variations on this theme are numerous.

.8 Bastard tuck-pointing - a ridge about 6 mm wide and 2 mm deep is formed directly on the flush joint. In historical practice this was often painted later in black or white when set.

3.8 CLEAN UP

.1 Excess mortar shall be immediately removed from adjacent surfaces.

.2 As work proceeds clean all masonry with a fibre-bristle brush or plastic brush. Do not use a metal brush at any time.

.3 Wash down the completed sections of wall from top to bottom as the pointing has hardened. Allow three days for the initial hardening of the mortar.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittals.

.2 Section 04 03 06 – Cleaning Historic Masonry.

.3 Section 04 03 07 – Repointing Historic Masonry.

1.2 MEASUREMENT PROCEDURES

.1 Measurement for payment for this work will be on an m^2 basis and will include costs associated with supplying materials, and executing work as described herein and reflected in contract.

1.3 ALTERNATIVES

.1 Obtain Departmental Representative's approval before changing procedures, manufacturer's brands, sources of supply of materials during entire contract.

1.4 REFERENCES

.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.

1.5 DEFINITIONS

.1 Repair of Stone: mechanical or plastic repair, done to restore original appearance and function of partly deteriorated stones.

.2 Filling: material used to rebuild broken or deteriorated part of stone.

.3 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.

.4 Mortar: material used to repoint the adjacent mortar joints to stone element being repaired. Refer to Section 04 03 07 Repointing Historic Masonry.

1.6 SUBMITTALS

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

.2 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

.3 Provide adhesive, mortar, and filling samples to CAN/CSA A179.

.4 Provide dowel samples.

.5 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 mock-up 1 m^2 minimum of stonework to be refaced with specified materials and methods.

.3 Construct mock-up where directed.

.4 Allow 48 hours for inspection of mock-up by Departmental Representative proceeding with stone repair work.

.5 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

.6 Clean mock-up to demonstrate cleaning operations to Departmental Representative starting cleaning work.

1.8 DELIVERY, STORAGE AND HANDLING

.1 Packing, shipping, handling and unloading:

.1 Deliver, store, handle and protect materials in accordance with Section 01 41 00 Regulatory Requirements.

.2 Keep material dry. Protect from weather, freezing and contamination. Store materials in a dry area and supported free of ground.

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 Portland cement: to CAN/CSA-A3000.

.2 Sand: cleaned and graded in accordance to ASTM C144.

.3 Epoxy:

.1 MANUFACTURERS:

.1 Akemi Plastics, Inc.; www.akemina.com

.2 Sika Corporaton; can.sika.com

.3 Hilti Corporation; www.hilti.ca

.4 Water: clean and free of deleterious materials such as acid, alkali and organic material in accordance to CAN/CSA A179.

.5 Dowels: stainless steel.

.1 MANUFACTURERS:

.1 Hilti Corporation; www.hilti.ca,

.2 Or approved equal.

.6 Stone slabs: to have similar mechanical and aesthetic properties to existing.

2.2 ADHESIVE MIXES

.1 Adhesive to contain epoxy.

.2 Submit samples for testing.

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 mould.

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 ERECTION, INSTALLATION, APPLICATION

.1 Carefully remove loose stone fragments from building. Re-use all pieces of broken stone that are in sound condition, without serious cracks or flaws.

.2 Clean any exposed metal anchors of all corrosion by scraping and brushing with stiff wire brushes.

.3 Clean surfaces to be laminated of grease and dust. Surfaces should also be dry.

.4 Mix hardener with mastic as per manufacturer's instructions.

.5 Apply adhesive evenly and completely to surfaces to be laminated. Set stone while adhesive is still tacky. Secure stone fragments in place against movement until each side is cured.

.6 Clean any residual adhesive from the stone with acetone.

.7 Pieces larger than 150mm x 150mm should be further anchored with rods drilled through the fragment and into the back-up stone.

3.4 PROTECTION

.1 Prevent damage to building, fencing, trees, landscaping, and pavement, which are to remain. Make good damage.

.2 Protect surrounding components from damage during work.

.3 Take utmost care not to damage historic fabric. Make good any damage.

.4 Obtain Departmental Representative's approval for repair methodology.

3.5 MORTAR JOINT REPAIR

.1 Make good any damage to mortar joints.

3.6 CLEANING

.1 Obtain Departmental Representative's approval of cleaning operations before starting cleaning work.

.2 Protect plants, grass, vegetation and adjacent grounds from excessive water accumulation

.3 Clean stone work surfaces after repairs have been completed and mortar has set.

.4 Clean stone surfaces of adhesive or mortar residue resulting from work performed without damage to stone or joints.

.5 Clear site of debris, surplus material and equipment, leaving work area in clean and safe condition.

3.7 PROTECTION OF COMPLETED WORK

.1 Protect finished work from impact damage until completion of project.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 09 03 61 – Repainting Historic Surfaces

1.2 REFERENCES

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)

.1 Architectural Woodwork Quality Standards Illustrated, 8th edition, Version 1.0 2003.

.2 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.

.3 Forest Stewardship Council (FSC)

.1 FSC-STD-01-001-2004, FSC Principle and Criteria for Forest Stewardship.

.4 National Hardwood Lumber Association (NHLA)

.1 Rules for the Measurement and Inspection of Hardwood and Cypress 1998.

.5 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.

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Protect materials against dampness during and after delivery.

.2 Store materials in ventilated areas, protected from extreme changes of temperature or humidity.

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 [custom] [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 [custom] [premium] grade, moisture content as specified.

.3 Forest Stewardship Council (FSC) certified.

2.2 ACCESSORIES

.1 Nails and staples: to CSA B111; galvanized to CAN/CSA-G164 for exterior work, interior humid areas and for treated lumber.

.2 Wood screws: type and size to suit application – match existing.

.3 Splines: wood.

.4 Adhesive: recommended by manufacturer.

.1 Adhesives: maximum VOC limit 30

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 CONSTRUCTION

.1 Fastening:

.1 Position items of finished carpentry work accurately, level, plumb, true and fasten or anchor securely.

.2 Design and select fasteners to suit size and nature of components being joined. Use proprietary devices as recommended by manufacturer.

.3 Set finishing nails to receive filler. Where screws are used to secure members, countersink screw in round smooth cut hole and plug with wood plug to match material being secured.

.4 Replace items of finish carpentry with damage to wood surfaces including hammer and other bruises.

.2 Standing and running trim:

.1 Install door and window trim in single lengths without splicing.

.3 Interior and exterior frames:

.1 Set frames with plumb sides, level heads, sills and secure.

.4 Half Timber boards:

.1 Secure boards to match existing installation method.

.5 Hardware:

.1 Remove and reinstall hardware to make repairs.

3.3 SCHEDULES

.1 Standing and running trim:

.1 Exterior:

.1 Grade: Match existing.

.2 Solid stock: Species to match existing.

END OF SECTION

Part 1. General

.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 02 83 10 – Lead – Base Paint Abatement

.2 Section 09 03 61 – Repainting Historic Surfaces

.4 Appendix D – Lead Paint Report & Recommendation

.2 SCOPE OF WORK INCLUDES:

.1 Existing Painted Wood Windows: Remove all loose and deteriorated paint to exterior side of sash, sill and frame including storm windows; utilize infrared heat gun and/or manually scrape, sand and repaint with primer and (2) top coats enamel paint. Complete minor repairs, treat deteriorated areas with fungicide, and repaint (prime coat and two (2) top coats). Allow for Repair Class I and II work as specified in this Section. Replace any broken glass and deteriorated putty. Replace perimeter caulking. Replace missing hardware.

.2 Lead: Test paint on exterior window for lead content. Allow for safe removal work procedures and disposal at approved site. Provide Departmental Representative with proof of disposal.

.3 Repainting: Assume two (2) paint colors for exterior.

.2 Related Work

.1 Cooperate with related trades in locating and accommodating work as it affects this trade.

.2 All existing paint finishes will be recorded by the Conservation Architect after scaffolding is installed and prior to the initiation of repairs. If during the course of dismantling the windows, evidence is uncovered which indicates the original finish, then this is to be left undisturbed and the Conservation Architect is to be advised so that the evidence can be reviewed and recorded.

.3 Qualified Conservation Tradesman

.1 Execute the work of this section under the continuous supervision and direction of a competent conservation carpenter.

.4 Storage & Handling of Materials

.1 All materials are to be kept dry and protected from weather and contamination.

.2 Manufacturers labels and seals must be intact upon delivery.

.3 Any new material that has deteriorated or been contaminated shall not be incorporated into the work and must be removed from the site.

.5 **Protection**

.1 Ensure all work areas where epoxy repairs, glazing and repainting are occurring are protected from excessive heat and/or cold. Do not proceed with work when the temperature is below 10 degrees Celsius.

.6 **Changes in Work**

.1 Report to the Conservation Architect all areas of deterioration uncovered during the execution of the work, and await any further instructions regarding repairs or replacement in this regard.

Part 2. Products

.1 **EPOXY**

.1 Epoxy agent shall be a two part system as distributed by E.T. Enterprises, Calgary Products include:

.1 System Three Rot-Fix Wood Sealer & Consolidant; quick setting, water consistency, for use in consolidation.

.2 System Three Sculpwood Putty; slow setting, mouldable putty, for crack filling, shape duplication, overhead work.

.3 G-2 #21-071; slow setting (up to 12 hour), thick consistency, for use with fillers (sawdust or sand) for void filling.

.4 Jet Set # 20-061; quick setting (1 hour) water consistency, for use in consolidation.

.5 PowerFil 10-EH; slow setting mouldable putty for crack filling, shape duplication and overhead work.

.2 Acceptable alternate epoxy agent as distributed by:
Advanced Repair Technology Telephone: 607-264-9040.
Products include:

.1 Flex-tec HV – Elastomeric wood repair compound

.2 Primatrate – low viscosity epoxy wood primer.

.2 **WOOD PRESERVATIVE**

.1 Wood preservative shall be a clear zinc naphthalate formulation.

.3 **PAINT STRIPPERS**

.1 A range of paint strippers may be required dependent on the actual paint layer being removed. Acceptable paint strippers include:

.1 Trisodium phosphate.

.2 Metheylene chloride based as manufactured by Fabrikem Paint Stripper Type M.

.3 Caustic based as manufactured by Fabrikem Paint Stripper Type H.

.4 Acid based as manufactured by Cira 1850.

.5 Environment Friendly as manufactured by Peel-Away, or Citrastrip.

.6 Peel-Away – Dumond Chemicals – phone (212) 869-6350.

.7 The Silent Paint Remover; Infrared Heat Tool, Model 1100-14 as distributed by Viking Sales Inc.

.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.

.5 **PUTTY FOR SINGLE GLAZING**

.1 Single glazed with oil putty. Acceptable alternate Elastomeric glazing compound. Glaze Ease 601 as manufactured by Advance Repair Technology telephone (607) 264-9040.

.6 **WOOD WINDOWS**

.1 New wood windows / sash to be fir construction. Acceptable supplier; Calgary Sash & Door or approved alternate.

Part 3. Execution

.1 **MOISTURE PENETRATION REPAIRS**

.1 Before undertaking any of the repairs mentioned in the following sections all sources of moisture penetration are to be identified on site with the Conservation Architect when the scaffolding is in place. Repairs to preclude future moisture penetration are to be completed first.

.2 Destroy all existing decay fungi and mould in order to arrest the

deterioration process. Commercially available fungicides and wood preservatives are toxic, so it is extremely important to follow the manufacturer's recommendations for application, and store all chemical materials safely. After fungicidal and preservative treatment the windows may be stabilized / rehabilitated.

.3 Remove any and all mould with safe and proper removal techniques.

.2 **Repair Class I - Routine Maintenance**

.1 Repairs to wooden windows are usually labor intensive and relatively uncomplicated. The on-site evaluation process is to be completed jointly by the Contractor and the Conservation Architect prior to specifying the final appropriate work program, establishing the work element priorities, and identifying the level of skill needed by the labour force. The steps required involve the following:

.1 Removal of loose and deteriorated exterior painted surfaces.

.2 Repairs to the exterior of the wood frame, sill and sash.

.3 Repainting.

.2 Historic windows have usually acquired many layers of paint over time. Removal of excess layers or peeling and flaking paint will facilitate operation and restore the clarity of the original detailing. Some degree of paint removal is also necessary as a first step in the proper surface preparation for subsequent refinishing. Paint colour analysis will be undertaken by the Conservation Architect once scaffold is erected for access and will be completed prior to the onset of the paint removal. There are several safe and effective techniques for removing paint from wood, depending on the amount of paint to be removed. The techniques to be utilized are manual scraping with the use of chemical stripping.

.3 **Repair Class II – Stabilization**

.1 Repair wood with minor splits, checks or shows signs of rot using established traditional technique as follows:

.1 Dry the wood.

.2 Treat decayed areas with a fungicide.

.3 Fill cracks and holes with epoxy.

.4 Waterproof with two applications of boiled linseed oil (application every 24 hours).

.5 After the surface has totally dried, paint with primer and two (2) top coats.

.2 Take care with the use of fungicide which is toxic. Follow the manufacturer's directions and use only on areas that will be painted. When using any technique of building up or patching a flat surface, slope the finished surface slightly to carry water away from the window and not allow it to puddle. Caulk joints between the sill and the jamb to reduce further water penetration.

.3 Strengthen and stabilize wood by consolidation, using semi-rigid epoxies which saturate the porous decayed wood and then harden. This is the preferred method of repair due to the longevity of the material. Fill the surface of the consolidated wood with a semi-rigid epoxy patching compound, the sand and paint. Use epoxy patching compounds to build up missing sections or decayed ends of members. Duplicate profiles using hand molds, which are created by pressing a ball of patching compound over a sound section of the profile which has been rubbed with butcher's wax. This can be a very efficient technique where there are many typical repairs to be done. Although epoxy materials are comparatively expensive, they are the most durable and long lasting materials available for wood repair.

.4 **Repair Class III – Splices and Parts Replacement**

.1 Remove affected parts of the window and reproduce the damaged or missing parts.

.2 The repairs discussed in this section involve mortise and tenon frame construction typical of windows, which may be in very deteriorated condition. Mortise and tenon units can be disassembled easily, if the units are out of the building. The installation or connection of some frames to the surrounding structure, especially masonry walls, can complicate the work immeasurably, and may even require dismantling of the wall. Generally, this is not recommended. Make necessary repairs in place wherever possible, using stabilization and splicing techniques.

.5 Detailed Repair Procedure: Exterior Windows and Frames

.1 Hardware: Remove, salvage, clean and refinish all hardware for re-

installation.

.2 Paint Removal: Remove all loose and deteriorated paint from frames and sash utilizing manual scrapping and infrared heat gun or chemical strippers. Perform a test section with paint strippers to determine most effective product and dwell time. Review with Conservation Architect before proceeding. Utilize custom made scrapers to remove all traces of paint along inside corners. See precautions for lead based paints. Neutralize surface in accordance with paint stripper manufacturer's recommendations. Test with litmus paper / pH test strips to verify surface is neutral (pH 7.0).

.3 Historic Colour Chronology: The Conservation Architect shall complete an historic colour analysis once scaffold is erected for access and before paint layers are removed.

.4 Sanding: After loose and deteriorated paint is removed, sequentially sand down the surface starting with 100 grit sand paper and finishing with 220 grit sand paper.

.5 Repairs and Splices: Consolidate small rotted areas using a liquid epoxy of water like consistency to saturate the areas first. Building up cracks and surface damage with a toolable flexible epoxy follows this. After it has set, sand down this surface to match the adjacent areas. For large sections of deteriorated surface, cut out deteriorated surface removing only the rotted section. Using a “Dutchman” technique cut in new wood sections to replace the deteriorated section. New section to be the same species of wood with identical profiles – this may require custom cutters for milling the timber.

.6 Preservative: Flood coat exterior surfaces subject to weathering (sills and horizontal check rails) with clear wood preservative.

.7 Oil Replacement: Surface treat exterior surfaces subject to weathering (sills and horizontal check rails) to replenish the natural oils. Apply a 50:50 mixture of linseed oil and turpentine. Allow absorbing for 10 minutes before wiping surface clean. Allow a minimum of 72 hours for the surfaces to dry before refinishing.

.8 Finishing: Prepare colour test panel for review by the Conservation Architect. Samples of paint colour draw-downs, examples of faux finish, gloss levels, sand painted finishes to be prepared as required.

.9 Hardware and Vents: Install existing rehabilitated/refinished hardware and new hardware as required. Install top and bottom vents complete with screening.

.6 **Lead Based Paint Removal**

.1 Evaluation: The simplest means of evaluation is to determine the age of the building. Anything prior to 1978, and for certain prior to 1950, with oil based paint is likely to contain lead. Confirmation of lead content can be verified with a simple lead swab test kit available from Safety Instruments Ltd., Edmonton (780-438-3028). Detailed testing of paint sample can be completed by AGAT Laboratories, Calgary, 403-299-2000.

.2 Worker Protection:

.1 Lead dust represents by far the most significant risk to workers. For this reason, three actions must be part of the work plan when handling lead based paint as follows:

.1 adequate worker protection
.2 containment of dust and debris
.3 proper clean up

.2 Utilized a low dust work technique for paint removal. Wet sanding and/or wet scraping are preferred methods of removal. Wet sanding can be accomplished by misting the surface and then sanding with a sponge-type sanding block that has been saturated in a deglossing liquid. Workers must work with dust masks with filters that are in accordance with NIOSH / MESA Standard. Ingestion of lead based paint is dangerous and must be prevented.

.3 Ingestion of lead based paint is dangerous and must be prevented. Utilize disposable/washable coveralls, together with gloves, when removing lead based paints. Workers are to remove coveralls and gloves upon completion of work and at any time when coffee or lunch breaks are taken. Prior to leaving the work area, workers are to wash up, including footwear, so as to remove any residual material and prevent its transport to another area.

.4 Provide containment; this can normally be accomplished by extending a layer of plastic sheeting 5 feet beyond the perimeter of the work area and sealing around the immediate area.

.5 In regards to clean up, it must be remembered that dust control is critical. Thus, dry sweeping or utilizing a conventional vacuum cleaner can actually spread dust rather then removing it, and therefore, is not permitted. HEPA vacuums differ from conventional vacuums in that they contain a high efficiency filter that is capable of trapping the small particles of lead, and thus are recommended for clean up of lead disturbed paint. Mopping and other wet cleaning utilizing a high phosphate content detergent (ie: TSP) is recommended.

.3 Removal Procedure

.1 With regards to lead based paint, two situations will typically occur:

.1 Windows and Doors (movable components) where complete paint removal is recommended.

.2 Fixed surfaces, such as walls, where (i.e. depends on the condition of the paint) it may be possible to encapsulate the surface rather then remove the lead based paint.

.2 Where paint is being encapsulated, clean the surface with a degreaser (ie: TSP) solution and sand lightly with a wet sanding technique. This should normally be sufficient for preparation for repainting. Any small areas of seriously deteriorated paint will require limited chemical stripping, followed by washing and sanding in preparation for painting.

.3 With regards to paint removal, strip all the paint from the surface to permanently eliminate the lead base paint hazard while retaining the historic fabric. The following paint removal techniques are prohibited:

.1 open flame burning
.2 sanding or grinding
.3 abrasive blasting or sand blasting
.4 dry scraping

.4 Depending upon the temperature of heat gun, it is possible to produce lead fumes creating a respiratory problem. Any mechanical tool or dry process will generate lead borne dust. Thus, the most acceptable technique for removal involves wet processes. Wet sanding and scrapping are recommended processes. Mist the surface then either sand with a sponge sand block or manually scrape. Chemical removal involves either environmentally friendly or caustic paint strippers. Off-site paint removal is preferred where possible since most of the contamination and residues are generated away from the building. Infrared heat stripper gun is acceptable if operated in accordance with manufacturer's recommendations.

.4 Clean Up and Disposal

.1 During the course of paint removal, contain all of the debris material and residue from the sanding/ scrapping/stripping processes. Lay plastic sheets and collect all material at the end of the working day. Clean and wash down the surfaces, and collect this residual material. All material is to be bagged and sealed in plastic bags and disposed of at an approved site. Verify with local landfill authority that disposal is acceptable prior to proceeding.

.2 Ensure all lead removal and handling is in compliance with the local authority having jurisdiction.

END OF SECTION

Part 1 General

1.1 INTENT

.1 This Section specifies general requirements for all painting, staining and finishing work to be performed, including repainting, re-staining and refinishing of historic surfaces.

1.2 SCOPE OF WORK

.1 Repainting of existing wood window frames and sills, and wood window sashes; wood trim and ventilation grills.

.2 Re-staining of existing wood half-timber elements, facia, soffit and trim.

.3 Repainting of existing metal handrails, guardrails, metal stair and landing assemblies, and metal ventilation grills.

.4 Repainting of existing stucco exterior wall finish.

.5 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.

1.3 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 02 83 10 - Lead Based Paint Abatement.

.3 Section 08 50 51 – Wood Window Repairs

.3 Section 09 24 23 – Portland Cement Stucco.

1.4 REFERENCE DOCUMENTS

.1 The painting and finishing specifications for new, not previously painted or finished, substrates are based on and make reference to the "Architectural Painting Specification Manual", 2001 edition, including the latest edition of the "Approved Products Lists", published by the Master Painters Institute (MPI).

.2 The painting and finishing specifications for previously painted or finished substrates are based on and make reference to the "Maintenance Repainting Manual", 2001 edition, including the latest edition of the "Approved Products Lists", published by the Master Painters Institute (MPI).

.3 The reference documents are available from:

Master Painters Institute (HQ)
4090 Graveley Street
Burnaby, BC. V5C 3T6
tel: (888)674-8937 toll free fax: (888)211-8708 toll free www.paintinfo.com

OR

Alberta Painting Contractors Association
2725 - 12th Street N.E.
Calgary, AB T2E 7J2
tel: (403)250-0903 fax: (403)291-9562

1.5 **PRODUCT DATA**

.1 Prior to commencement of work of this section, submit list of products proposed for use corresponding to the specified finishing systems. Include manufacturer's name, manufacturer's product name, manufacturer's product code and MPI number of each product.

1.6 **SAMPLES**

.1 Provide draw downs of each new paint colour - 2 samples of each colour required.

.2 Drawn downs to be min 800mm x 800mm in size.

1.7 **DELIVERY, STORAGE AND HANDLING**

.1 Deliver materials in sealed original labelled containers bearing manufacturer's name, type of material, brand name, colour designation, and where applicable, instructions for mixing and reducing.

.2 Store paint and other materials in a single heated and well ventilated area with a minimum ambient temperature of 7°C.

.3 Take precautionary measures to prevent fire hazards or spontaneous combustion.

1.8 **SITE CONDITIONS**

.1 **Exterior**

.1 Temperature: Apply coatings only when temperature is above 10°C.

.2 Precipitation: Do not apply coatings during periods of precipitation nor when precipitation is imminent.

.3 Wind: Do not apply coatings under high wind conditions resulting in wind blown dust and debris.

1.9 **CO-ORDINATION**

.1 Ensure that site applied paints and finishes are compatible with primers or other finishes applied in the shop or factory.

1.10 **SEQUENCING AND SCHEDULING**

.1 Where exposed exterior wood substrates are to receive a transparent finish, plan and schedule work to immediately follow installation of wood to prevent water staining and weathering of such substrates.

1.11 **STANDARD OF ACCEPTANCE**

.1 The following requirements establish the standard of acceptance for the Work, when viewed using the final lighting source.

.1 Vertical surfaces: No defects visible from a distance of 1 metre at 90 degrees to surface.

.2 Horizontal surfaces: No defects visible from a distance of 1 metre at 45 degrees to surface.

.3 Final coat shall exhibit uniformity of sheen across full surface area.

.2 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.

1.12 **MAINTENANCE MATERIALS**

.1 Leave on premises not less than one (1) litre of new material of each colour and finish sheen used.

.2 Provide maintenance materials in new containers, full, tightly sealed and clearly labeled. Remnants of used materials are not acceptable.

Part 2 Products

2.1 **MATERIALS**

.1 Paint and Other Finishing Materials

.1 Refer to Schedule Sections for required finishing systems.

.2 Use only MPI approved products from the MPI Approved Product Lists corresponding to the specified finishing systems.

.3 Acceptable Paint Suppliers: SICO, General Paints, Benjamin Moore, or approved alternate.

.2 Thinners: Odourless paint thinner, pure and clean with no deleterious material.

.3 Patching compounds: Spackling compound or oil base putty for substrates receiving a paint finish. Oil base putty, coloured to match finish, for substrates receiving a transparent finish.

2.2 **MIXING**

.1 Except as otherwise specified, paint shall be ready mixed. Re-mix prior to application to ensure colour and gloss uniformity. Materials in paste or powder form, or to be field-catalyzed, shall be field mixed in accordance with manufacturer's directions. Perform colour-tinting operations prior to delivery to site.

.2 Thinning of materials only to extent permitted by paint manufacturer will be permitted. Do not use solvent for thinning.

.3 Strain materials thoroughly prior to application.

2.3 **COLOURS**

.1 Exterior Window Sill and Frame; and Sash: assume one (1) paint colour to match existing colour.

.2 Exterior Wood Vent: assume one (1) paint colour (to match Windows).

.2 Exterior Half Timber elements and wood trim, typical: assume (1) stain colour to match existing colour.

.4 Exterior Metal elements: assume one (1) paint colour (to match Half Timber stain).

2.4 **GLOSS LEVELS**

.1 Specified gloss levels are based on the MPI standard, which is as follows:

.1 Level G1 - Matte or Flat: gloss rating of 0 to 5 units at 60 degrees and sheen rating of a maximum of 10 units at 85 degrees.

.2 Level G2 - Velvet: gloss rating of 0 to 10 units at 60 degrees and a sheen rating of 10 to 35 units at 85 degrees.

.3 Level G3 - Eggshell: gloss rating of 10 to 25 units at 60 degrees and a sheen rating of 10 to 35 units at 85 degrees.

.4 Level G4 - Satin: gloss rating of 20 to 35 units at 60 degrees and a sheen rating of 35 units minimum at 85 degrees.

.5 Level G5 - Semi-gloss: gloss rating of 35 to 70 units at 60 degrees.

.6 Level G6 - Gloss: gloss rating of 70 to 85 units at 60 degrees.

.7 Level G7 - High-gloss: gloss rating of more than 85 units at 60 degrees.

.2 Except as otherwise specified, the gloss levels are to match the existing historic finishes.

2.5 **SITE PAINTING AND FINISHING SCHEDULES**

.1 **Exterior Surfaces**

.1 Existing Wood - Stripping Existing Paint and Repainting
Preparation - remove paint - refer to Section 08 50 51 - Wood Window Repairs
1st coat primer - tinted
2nd coat acrylic enamel, semi-gloss, high gloss
3rd coat acrylic enamel, semi-gloss, high gloss

.2 New Wood - With Solid Colour
Preparation - ensure moisture content is below 15%, sand surface of any planed lumber with #120 grit sandpaper to remove mill glaze; if wood has been factory dressed (ie: as in new wood windows), open wood pores by applying naphtha followed by a thin layer of lacquer thinner; let dry for 24 – 48 hours; back prime all unexposed faces prior to installing; if cedar, apply seal coat to prevent bleeding.
1st coat primer
2nd coat acrylic undercoat
3rd coat acrylic enamel, semi-gloss, or high gloss

.3 Existing Wood – Existing Stain and Re-staining
Preparation – remove old stain, dirt, surface contaminants, and loose wood fibres with application of a wood cleaner, and a wood brightener; apply a small amount of diluted bleach or biocide to spot areas of lichen or mildew; ensure moisture content of wood is below 15%; open wood pores with naphtha followed by lacquer thinner – do not sand, which removes visible texture and patina of the wood; let dry for 24 – 48 hours; re-finish promptly to seal and prevent environmental contamination.
1st coat semi-solid, penetrating, waterbourne stain, flat/ultraflat finish
2nd coat semi-solid, penetrating, waterbourne stain, flat/ultraflat finish

.4 New Wood – Stain, semi-solid colour.
Preparation – ensure moisture content of wood is below 15%; lightly sand surfaces with #120 grit sandpaper, and open wood pores with naphtha followed by lacquer thinner; finish promptly to seal and prevent environmental contamination.
1st coat semi-solid, penetrating, waterbourne stain, flat/ultraflat finish
2nd coat semi-solid, penetrating, waterbourne stain, flat/ultraflat finish

.5 Existing Wood - clear finish
Preparation - light sanding
two (2) coats - marine grade varnish - satin coat

.6 Existing Metal - solid colour
Preparation - sand blast to remove surface paint and corrosion.

1st coat - alkyd primer - tinted
2nd coat - alkyd enamel - high gloss
3rd coat - alkyd enamel - high gloss

.7 Existing Stucco - solid colour
Preparation – Doff steam cleaning, or Joss-Torq low pressure cleaning, or manual scrubbing with soft bristle brush and surfactant to remove dirt and environment contaminants. Seal all cracks with paintable caulking. Stucco repairs as per Section 09 24 23 – Portland Cement Stucco.
1st coat – latex acrylic, semi-elastomeric – eggshell/match existing
2nd coat - latex acrylic, semi-elastomeric – eggshell/match existing

Part 3 Execution

3.1 VERIFICATION OF CONDITIONS

.1 Ensure all dust-generating activities have been terminated and dust removed.

.2 Prior to commencement of painting and finishing work, thoroughly examine substrates scheduled to receive coatings.

.3 Do not apply coatings to substrates whose condition will adversely affect execution, permanence, or quality of work and which cannot be put into an acceptable condition through preparatory work specified herein.

.4 Verify compatibility of any previously applied coatings with specified coatings.

3.2 PROTECTION OF EXISTING SURFACES

.1 Protect all adjacent surfaces from over-spray, splashing, and droplets.

.2 Remove electrical plates, surface hardware, fittings and fastenings prior to painting and finishing operations. Carefully store and replace these items on completion of work in each area.

.3 Keep sprinkler heads and smoke detectors free of paint. Replace those that do receive paint.

3.3 CONDITION OF SUBSTRATES

.1 Substrates shall be sound, non-dusting, and free of grease, oil, dirt and other matter detrimental to adhesion and appearance of coatings.

.2 Temperature: minimum 10°C.

.3 Test moisture content using electronic moisture meter. Maximum moisture content is: Wood: 15%.

.4 Alkalinity: test substrate for alkalinity using litmus paper test. If greater than 7, refer to manufacturer’s requirements.

3.4 PREPARATION OF NEW/UNFINISHED SUBSTRATES

.1 Prepare substrates in accordance with requirements of the MPI Manual, Chapter 2 and 3, Section 3-Surface Preparation, and as specified herein.

.2 All Substrates: thoroughly broom, vacuum and wipe clean as required to produce acceptable surface. Sand lightly and dust prior to application of each coat. Use recommended type and grade of sandpaper to avoid scratching or gouging of surfaces.

.3 Wood Generally: clean soiled surfaces, sand smooth and dust. Fill nail holes, splits, scratches, small joints and other minor imperfections with patching compound after paint prime coat or first varnish coat has been applied and dried. Apply putty with putty knife, press firmly in place, and finish flush with surface.

.4 Wood for Paint Finish: clean knots, pitch streaks, and sappy sections of residue and seal such areas with shellac or knot sealer before applying prime coat.

.5 Wood for Transparent Finish: clean knots, pitch streaks, and sappy sections of residue and seal with sanding sealer or shellac after applying stain, if stain is required. Sand between coats using minimum #400 grit wet and dry sandpaper.

.6 Bare Ferrous Metal: Prepare in accordance with MPI 5.1 requirements for the system specified.

.7 Previously Primed Metal: remove loose shop primer and rust; make good shop coat, feather out edges of touch-up.

.8 Zinc Coated Metal: Prepare in accordance with MPI 5.3 requirements for the system specified.

.9 Alkaline Surfaces: wash and neutralize using recommended type of solution compatible with paint to be used. Verify with pH test strips.

.10 Previously painted stucco: wash to remove dirt and environmental contaminants. Apply paint with min. 30mil ‘thick pile’ rollers, 1st coat horizontal and 2nd coat vertical, and backroll to ensure coverage.

3.5 PREPARATION OF PREVIOUSLY COATED SUBSTRATES

.1 Thoroughly inspect existing conditions to verify the degree of surface deterioration (DSD) of each previously coated substrate required to be repainted or refinished. Degrees of surface deterioration shall be as defined in the "Maintenance Repainting Manual” (MR Manual), Chapter 2 and 3, Section 3 - Surface Preparation.

.2 Prepare substrates using surface preparation procedures in Chapter 6 Section 2, including cleaning and removal systems, specified for the degree of surface deterioration.

3.6 APPLICATION OF COATINGS, GENERALLY

.1 Applied and cured coatings shall be uniform in thickness, sheen, colour, and texture and be free of defects detrimental to appearance and performance. Edges of paint adjoining other materials shall be clean and sharp with no overlapping.

.2 Use rollers that will produce the least possible stipple effect; maximum 10 mm pile for smooth substrates. Heavier pile rollers may be permitted for use on rough substrates, subject to the Conservation Architect's approval.

.3 Back roll airless spray application.

.4 Use a single manufacturer's products for all coats required for each finish system.

.5 Vary slightly the colour of successive coats to visibly differentiate between coats.

.6 Allow each coat to dry hard before succeeding coats are applied with a minimum of 24 hours between coats, except where manufacturer's instructions state otherwise.

.7 For woodwork to receive a stain finish apply paste wood filler to open grain wood followed by uniform coats of stain and wipe off if required. Wood shall have a uniform shade. Match stain so that dissimilar woods have uniform finished appearance.

.8 For open grain woods to receive a clear finish, tint paste wood filler to match wood. Work filler well into grain and before it sets, wipe off excess to provide a clean surface.

3.7 FINISHING OF NEW/UNFINISHED SUBSTRATES

.1 Site paint or finish all work and substrates indicated as requiring site painting or finishing in Schedules, Drawings, or Specifications.

2 Site apply all prime and finish coats as scheduled, whether or not factory prime coats have been applied.

3.8 FINISHING OF PREVIOUSLY COATED SUBSTRATES

.1 Repaint or refinish all work and substrates indicated as requiring repainting or refinishing in Schedules, Drawings, or Specifications.

3.9 BACK-PRIMING EXTERIOR WOOD

.1 Back prime concealed surfaces of the following components, prior to their installation:
- .1 Wood siding.
- .2 Wood fascia.
- .3 All other wood components with one or more surfaces exposed to the exterior and one or more surfaces concealed after installation.

.2 Use exterior alkyd primer for components scheduled to receive a paint finish.

.3 Use semi-transparent stain for components scheduled to receive a solid or semi-transparent stain finish.

.4 Use gloss varnish, reduced 25% with thinner, for components scheduled to receive a varnish finish.

3.10 **PATCHING OF COMPLETED WORK**

.1 Repair, touch-up, and refinish damaged finishes and finishes unsatisfactory to the Conservation Architect.

.2 Refinish entire wall or area where deemed necessary by the Conservation Architect.

3.11 **CLEANING**

.1 Place cotton waste, cloths and other material that may constitute a fire hazard in metal containers and remove from site daily.

END OF SECTION

Part 1. General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 09 03 61 – Repainting Exterior Surfaces

1.2 REFERNCE DOCUMENTS

.1 American Society for Testing and Materials (ASTM):

.1 ASTM C932-06 Surface-Applied Bonding agents for Exterior Plastering

.2 Association of Wall and Ceiling Contractors (AWCC):

.1 Association of Wall and Ceiling Contractors Specification Standards Manual", 2003 Edition, Section 9.3 – Stucco (AWCC Manual)

.3 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-51.32-M77 Sheathing, Membrane, Breather Type

.4 Canadian Standards Association (CSA):

.1 CSA-A8/A5/A362-93 Portland Cement / Masonry Cement / Blended Hydraulic Cement

1.3 REQUIREMENTS

.1 Comply with "Association of Wall and Ceiling Contractors Specification Standards Manual", 2003 Edition, Section 9.3 – Stucco. (AWCC Manual).

1.4 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer’s printed product literature, specifications and data sheets in accordance with Section 01 33 00 - Submittal Procedures.

.2 Provide data from manufacturer of liquid bonding agent indicating compliance with requirements.

.3 Submit two copies of Workplace Hazardous Materials Information System (WHMIS) Material Safety Data Sheets (MSDS) in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOCs.

1.5 QUALITY ASSURANCE

.1 Mock-Ups:

.1 Prepare minimum 1200 mm x 2400 mm site mock-up showing specified finish and thickness of each coat, for approval Departmental Representative.

.2 Approved mock-up shall establish minimum standard for work of this Section.

Part 2. Products

2.1 MATERIALS

.1 Sheathing Paper: to CAN/CGSB-51.32, breather type.

.2 Trim accessories: in accordance with AWCC Manual.

.3 Reinforcement: metal lath or stucco mesh in accordance with AWCC Manual.

.4 Portland Cement: to CAN/CSA-A5 white.

.5 White Sand and Water: in accordance with AWCC Manual.

.6 Colour Additive: Non-fading mineral pigments.

.7 Liquid Bonding Agent: to ASTM C932, non-re-emulsifiable. Suitable for incorporation into plaster mix.

.8 Elastomeric sealant: non-shrink, chemical bond. 3M or equal.

2.2 MIXING AND PROPORTIONING

.1 Mix and proportion stucco in accordance with AWCC Manual.

Part 3. Execution

3.1 PREPARATION OF SURFACES

.1 Prepare surfaces in accordance with AWCC Manual.

3.2 APPLICATION

.1 Apply materials in accordance with AWCC Manual.

.2 Apply sheathing paper horizontally. Lap side joints 100 mm and ends 200 mm, to drain to exterior.

3.3 FINISH COLOUR AND TEXTURE

.1 Texture: Match existing.

.2 Colour: Match existing.

3.4 REPAIR

.1 Lightly tap with hammer to identify hollow areas. Remove unsound or soft areas of stucco by hand with chisel or other hand tools.

.2 Petrographic examination and chemical analysis (ASTM C 1324) of plaster samples can determine mix components and quality of bond between coats. Provide testing results to Departmental Representative and Conservation Architect.

.3 Paper Repair:

.1 Replace existing building paper with new paper. Kraft, Waterproofed, Water-repellant, and Fire Resistant – match existing.

.2 Slip new paper behind existing paper at least 100mm.

.4 Lath Repair:

.1 Corroded or damaged lath should be cut out and repaired with new conforming with AWCC and ASTM C 847. New lath must be installed in contact with old lath.

.2 Anchor new lath to studs or substrate at no more than 170mm on centre spacing.

.5 Surface Preparation:

.1 Bonding agents conforming to ASTM C 932 can be used.

.6 Patch Application:

.1 The same techniques used in the application of plaster in new construction may be used in repair, and are outlined in ASTM C 926.

.2 Apply scratch coat the same thickness as surrounding scratch coat with enough pressure to completely embed the metal lath (when present).

.3 As soon as the scratch coat becomes firm, score the surface in one direction only. Vertical wall surfaces should be scored horizontally.

.4 Allow scratch coat to dry for 24 hours.

.5 Apply brown coat at the same thickness as the existing brown coat.

.6 Follow the same procedure for the finish coat.

.7 Crack Repair:

.1 Identify cracks to be repaired and provide crack repair map for approval by Departmental Representative and Conservation Architect.

.2 Superficial cracking:

.1 <7mm in width, and/or non-through cracking that only occurs at brown

and/or finish coat.

.2 Seal with paintable caulking.

.3 Through cracking:

.1 >7mm in width, and/or through cracking that penetrates to the substrate or lath. Cracks allowing for leakage or otherwise causing additional damage to the building should be repaired.

.2 Widen crack with hand tools, such as chisels, or carefully with a saw or grinder to create a “v” groove/reservoir.

.3 Fill groove with elastomeric sealant. Consult sealant manufacture for dimensions of the sealant groove/reservoir.

.4 Apply “brush grade” sealant at narrow cracks, and “knife grade” sealant at wider cracks.

.5 Tool finish to match existing texture.

.6 Broadcast silica sand onto applied sealant to provide a roughened texture.

3.6 CURING

.1 Moist cure as required to prevent shrinkage and drying before hydration and hardening of stucco takes place. Maintain 80% humidity for at least 24 hours.

.2 Provide tarpaulins as required preventing excessive drying in hot and windy conditions.

3.7 CLEANING

.1 Obtain Departmental Representative's approval of cleaning operations before starting cleaning work.

.2 Protect plants, grass, vegetation and adjacent grounds from excessive water accumulation

.3 Clear site of debris, surplus material and equipment, leaving work area in clean and safe condition.

3.8 PROTECTION OF COMPLETED WORK

.1 Protect finished work from impact damage until completion of project.

END OF SECTION

Part 1. General

1.1 UNIT PRICES

.1 Unit Description: Restoration of grassed areas.

.2 Unit of Measurement: lump sum.

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.

END OF SECTION