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Issued for Tender

Fort Malden
National Historic Site of Canada
Parks Canada Agency

Architectural – Civil Engineering

May, 24. 2019

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S P E C I F I C A T I O N S

End of Section

1 GENERAL

1.01 NOT USED

.1 Not used.

1.02 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises the conservation of masonry, wood windows, cedar shingle roofing of the Brick Barracks and Hough House and the landscape pathways improvements of Fort Malden National Historic Site of Canada, located at 100 Laird Avenue, Amherstburg, Ontario.

1.03 CONTRACT METHOD

.1 Construct Work under stipulated price contract.

.2 Relations and responsibilities between Contractor and subcontractors are as defined in Conditions of Contract. Assigned Subcontractors must, in addition:

.1 Furnish to Contractor, bonds covering faithful performance of subcontracted work and payment of obligations thereunder when Contractor is required to furnish such bonds to Parks Canada Agency.

.2 Purchase and maintain liability insurance to protect Contractor from claims for not less than limits of liability which Contractor is required to provide to Parks Canada Agency.

1.04 WORK BY OTHERS

.1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Departmental Representative or designate.

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

1.05 WORK SEQUENCE

.1 Construct Work in stages to accommodate Parks Canada Agency continued use of premises during construction.

.2 Co-ordinate Progress Schedule and co-ordinate with Departmental Representative Occupancy during construction.
.1

.3 Construct Work in stages to provide for continuous public usage. Do not close off public usage of facilities until use of one stage of Work will provide alternate usage.

.4 Maintain fire access/control.

1.06 CONTRACTOR USE OF PREMISES

.1 Limit use of premises for Work to allow:

.1 Parks Canada Agency Staff occupancy.
.2 Partial Departmental Representative occupancy.
.3 Work by other contractors.
.4 Site visitor usage.

.2 Co-ordinate use of premises under direction of Departmental Representative.

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

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

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

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

1.07 PARKS CANADA AGENCY OCCUPANCY

.1 Parks Canada Agency will occupy premises during entire construction period for execution of normal operations.

.2 Co-operate with Departmental Representative or designate in scheduling operations to minimize conflict and to facilitate Departmental Representative usage.

1.08 PARTIAL PARKS CANADA AGENCY OCCUPANCY

.1 Schedule and substantially complete designated portions of Work for Parks Canada Agency Staff occupancy prior to Substantial Performance of entire Work.

.2 The Cook House of the Brick Barracks Building is a designated portion for construction impact.

.3 Parks Canada Agency will occupy designated areas for purpose of maintaining operations of the Museum within Hough House and the display areas of the Brick Barracks Building and kitchen.

1.09 PARKS CANADA AGENCY FURNISHED ITEMS

.1 Parks Canada Agency Responsibilities:
.1 Arrange for review of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.
.2 Inspect deliveries jointly with Contractor.
.3 Provide access to the work areas.

.2 Contractor Responsibilities:
.1 Designate submittals and delivery date for each product in progress schedule.
.2 Review shop drawings, product data, samples, and other submittals. Submit to Departmental Representative notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.
.3 Receive and unload products at site.

.4 Inspect deliveries jointly with Departmental Representative; record shortages, and damaged or defective items.
.5 Handle products at site, including uncrating and storage.
.6 Protect products from damage, and from exposure to elements.
.7 Assemble, install, connect, adjust, and finish products.
.8 Provide installation inspections required by public authorities.
.9 Repair or replace items damaged by Contractor or subcontractor on site under his control.

1.10 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Departmental Representative or designate to facilitate execution of work.

.2 Use only temporary works or stairs existing in building for moving workers and material.
.1 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.11 EXISTING SERVICES

.1 Notify, Departmental Representative or designate and utility companies of intended interruption of services and obtain required permission.

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

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

.4 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative or designate of findings.

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

.6 Provide temporary services when directed by Departmental Representative or designate to maintain critical building and tenant systems.

.7 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.

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

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

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

.11 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers

and Enclosures.

1.12 DOCUMENTS REQUIRED

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

1.13 SPECIAL REQUIREMENTES - ARCHEOLOGY

.1 All or any buried artifacts, the remains and evidence of ancient persons and peoples, and/or any object of historic value and worth remain the property of the Crown. Any and all such objects shall be protected and immediately brought to the attention of the Departmental Representative.

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 11 00 Summary of Work.

.2 Standards and Guidelines for the conservation of Historic Places in Canada (2010)2nd Edition

1.02 ACCESS AND EGRESS

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

1.03 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative or designate to facilitate work as stated.

.2 Maintain existing services to building and provide for personnel and vehicle access.

.3 Where security is reduced by work provide temporary means to maintain security.

.4 Departmental Representative or designate will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Use only stairs existing in building for moving workers and material.
- .1 Protect walls of stairwell to approval of Departmental Representative prior to use.
- .2 Accept liability for damage, safety of equipment and overloading of existing equipment/structure.

.6 Closures: protect work temporarily until permanent enclosures are completed. The site is a National Historic Site of Canada and must be treated as such. Excavation or storage of material beyond the immediate work area as defined by the departmental rep. is strictly prohibited, every precaution will be taken.

1.04 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

.1 Execute work with least possible interference or disturbance to building operations, occupants, public and normal use of premises. Arrange with Departmental Representative to facilitate execution of work.

1.05 RELICS AND ANTIQUITIES

.1 Relics and antiquities, and items of historical or scientific interest such as cornerstones and contents, commemorative plaques, inscribed tables, and similar objects found on shall remain the property of Parks

Canada. Protect such articles and request direction from Departmental Representative.

.2 Should historic objects be uncovered during excavating, stop work immediately and notify the Departmental Representative. Do not resume work until directed to by the Project Manager or Designate.

.3 Archaeology staff from Parks Canada may be required to monitor the project work and may require temporary stop of work to carry out site investigations. Contractor should be prepared to direct resources elsewhere until direction is given by the Project Manager or Designate

1.06 EXISTING SERVICES

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

.2 Where Work involves breaking into or connecting to existing services, give Departmental Representative or designate 48 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends.

.3 Provide for personnel, pedestrian and vehicular traffic.

.4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.07 SPECIAL REQUIREMENTS

.1 Submit schedule in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

.2 Ensure Contractor's personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.

.3 Keep within limits of work and avenues of ingress and egress.

.4 Ingress and egress of Contractor vehicles at site is limited to Laird Avenue south vehicular access (south of the Brick Barracks Building).

.5 Deliver materials outside of peak traffic hours 17:00 to 07:00 and 13:00 to 15:00 unless otherwise approved by Departmental Representative or designate.

1.08 SECURITY

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

.2 Security clearances:
- .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require to enter premises.
- .2 Obtain requisite clearance, as instructed, for each individual required to enter premises.

1.09 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions. Smoking is not permitted.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 11 00 Summary of Work.

.2 Section 01 14 00 Work Restrictions.

.3 Section 01 33 00 Submittal Procedures.

1.02 ADMINISTRATIVE

.1 Schedule and administer project meetings throughout the progress of the work at the call of Departmental Representative.

.2 Prepare agenda for meetings.

.3 Distribute written notice of each meeting four days in advance of meeting date to Departmental Representative.

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

.6 Record the meeting minutes. Include significant proceedings and decisions. Identify actions by parties.

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and affected parties not in attendance, Departmental Representative.

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

1.03 PRECONSTRUCTION MEETING

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

.2 Departmental Representative, Contractor, major Subcontractors, field inspectors and supervisors will be in attendance.

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

.4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.

.5 Agenda to include:
  .1 Appointment of official representative of participants in the Work.
  .2 Schedule of Work: in accordance with Section 01 32 16.19 - Construction Progress Schedules - Bar (GANTT) Chart.

.3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
.4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
.5 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.
.6 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
.7 Owner provided products.
.8 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
.9 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
.10 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
.11 Monthly progress claims, administrative procedures, photographs, hold backs.
.12 Appointment of inspection and testing agencies or firms.
.13 Insurances, transcript of policies.

1.04 PROGRESS MEETINGS

.1 During course of Work and 4 weeks prior to project completion, schedule progress meetings monthly.

.2 Contractor, major Subcontractors involved in Work and Departmental Representative or designate are to be in attendance.

.3 Notify parties minimum 14 days prior to meetings.

.4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 11 00 Summary of Work.

.2 Section 01 14 00 Work Restrictions.

.3 Section 01 33 00 Submittal Procedures.

1.02 DEFINITIONS

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

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

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

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

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

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

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

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

.9 Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones.

1.03 REQUIREMENTS

.1 Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration.

.2 Plan to complete Work in accordance with prescribed milestones and time frame.

.3 Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting.

.4 Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

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

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

1.05 PROJECT MILESTONES

.1 Not used.

1.06 MASTER PLAN

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

.2 Departmental Representative will review and return revised schedules within 5 working days.

.3 Revise impractical schedule and resubmit within 5 working days.

.4 Accepted revised schedule will become Master Plan and be used as baseline for updates.

1.07 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from all summary of work indicating each task required.

1.08 PROJECT SCHEDULE REPORTING

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

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

1.09 PROJECT MEETINGS

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

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

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 11 00 Summary of Work.

.2 Section 01 14 00 Work Restrictions.

.3 Section 01 31 19 Project Meetings.

.4 Section 01 32 16.19 Construction Progress Schedule.

1.02 REFERENCE STANDARDS

.1 Not Used.

1.03 ADMINISTRATIVE

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

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

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

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

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

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

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

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

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

Representative review.

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

1.04 SHOP DRAWINGS AND PRODUCT DATA

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

.2 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

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

.4 Allow 14 days for Departmental Representative's review of each submission.

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

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

.7 Accompany submissions with transmittal letter, 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.

.8 Submissions include:

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

dimensions, and clearances.
.3 Setting or erection details.
.4 Capacities.
.5 Performance characteristics.
.6 Standards.
.7 Operating weight.
.8 Wiring diagrams.
.9 Single line and schematic diagrams.
.10 Relationship to adjacent work.

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

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

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

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

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

.2 Testing must have been within 1 year of date of contract award for project.

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

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

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

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

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

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

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

.17 Submit electronic copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by

Departmental Representative.

.18 Delete information not applicable to project.

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

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

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

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

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

1.05 SAMPLES

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

.2 Deliver samples prepaid to Departmental Representative's business address.

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

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

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

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

.7 Reviewed and accepted samples will become standard of workmanship and

material against which installed Work will be verified.

1.06 MOCK-UPS

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

1.07 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, fine resolution monthly with progress statement and as directed by Departmental Representative.

.2 Project identification: name and number of project and date of exposure indicated.

.3 Number of viewpoints: 4 locations.
- .1 Viewpoints and their location as determined by Departmental Representative.

.4 Frequency of photographic documentation: weekly as directed by Departmental Representative.
- .1 Upon completion of: excavation, foundation, framing and services before concealment of Work and as directed by Departmental Representative.

1.08 CERTIFICATES AND TRANSCRIPTS

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

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 00 11 00 Summary of Work.

.2 Section 00 14 00 Work Restrictions.

.3 Section 00 41 00 Regulatory Requirements.

1.02 REFERENCE STANDARDS

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

.2 Province of Ontario
  .1 Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. 1990, c.0.1, as amended and O. Reg. 213/91 as amended - Updated 2005.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 5 working days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
  .1 Results of site specific safety hazard assessment.
  .2 Results of safety and health risk or hazard analysis for site tasks and operation.

.3 Submit a digital file of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative bi-weekly.

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

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS Safety Data Sheets (SDS).

.7 Departmental Representative will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within 5 working days after receipt of plan. Revise plan as appropriate and resubmit plan to Departmental Representative within 5 working days after receipt of comments from Departmental Representative.

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

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

Representative.

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

1.04 FILING OF NOTICE

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

.2 Contractor shall be responsible and assume the Principal Contractor role for each work zone location and not the entire complex. Contractor shall provide a written acknowledgement of this responsibility with 3 weeks of contract award.

.3 Contractor shall install proper site separation and identification in order to maintain time and space at all times throughout life of project.

1.05 SAFETY ASSESSMENT

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

1.06 MEETINGS

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

1.07 REGULATORY REQUIREMENTS

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

1.08 PROJECT/SITE CONDITIONS

.1 Not used.

1.09 GENERAL REQUIREMENTS

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

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

1.10 RESPONSIBILITY

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

.2 Contractor will be responsible and assume the role Constructor as described in the Ontario Occupational Health and Safety Act and Regulations for Construction Projects.

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

1.11 COMPLIANCE REQUIREMENTS

.1 Comply with Ontario Occupational Health and Safety Act, R.S.O. 1990, c. 0.1 and Ontario Regulations for Construction Projects, O. Reg. 213/91.

.2 Comply with Occupational Health and Safety Regulations, 1996.

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

1.12 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 Ontario having jurisdiction and advise Departmental Representative verbally and in writing.

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

1.13 HEALTH AND SAFETY CO-ORDINATOR

.1 Employ and assign to Work, competent and authorized representative as Health and Safety Co-ordinator. Health and Safety Co-ordinator must:
- .1 Have working knowledge of occupational safety and health regulations.
- .2 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
- .3 Be responsible for implementing, enforcing daily and monitoring site-specific Contractor's Health and Safety Plan.
- .4 Be on site during execution of Work.

1.14 POSTING OF DOCUMENTS

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

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.

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section references to laws, by laws, ordinances, rules, regulations, codes, orders of Authority Having Jurisdiction and other legally enforceable requirements applicable to Work and that are; or become, in force during performance of Work.

.2 Standards and Guidelines for the conservation of Historic Places in Canada (2010) 2nd Edition

1.02 RELATED REQUIREMENTS

.1 All sections.

1.03 REFERENCES TO REGULATORY REQUIREMENTS

.1 Perform Work in accordance with 2012 Ontario Building Code 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 Specific design and performance requirements listed in specifications or indicated on Drawings may exceed minimum requirements established by referenced Building Code; these requirements will govern over the minimum requirements listed in Building Code
.1 Meet or exceed requirements of:
.1 Contract documents.
.2 Specified standards, codes and referenced documents.

1.04 HAZARDOUS MATERIAL DISCOVERY

.1 Asbestos: demolition of spray or trowel-applied asbestos is hazardous to health. Stop work immediately when material resembling spray or trowel-applied asbestos is encountered during demolition work. Notify Departmental Representative.

.2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Departmental Representative.

.3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Departmental Representative.

1.05 BUILDING SMOKING ENVIRONMENT

.1 Comply with smoking restrictions and municipal by-laws.

1.06 NATIONAL PARKS ACT

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

1.07 QUALITY ASSURANCE

.1 Regulatory Requirements: Except as otherwise specified, Constructor shall apply for, obtain, and pay fees associated with, permits, licenses, certificates, and approvals required by regulatory requirements and Contract Documents, based on General Conditions of Contract and the following:
  .1 Regulatory requirements and fees in force on date of Bid submission, and
  .2 A change in regulatory requirements or fees scheduled to become effective after date of tender submission and of which public notice has been given before date of tender submission

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

2.02 EASEMENTS AND NOTICES

.1 Departmental Representative will obtain permanent easements and rights of servitude that may be required for performance of Work.

.2 Constructor shall give notices required by regulatory requirements.

2.03 PERMITS

.1 Building Permit:
  .1 Constructor will apply for and will be paying for building permit. Constructor is responsible for obtaining or coordinating other permits required for Work and its various parts.
  .2 Constructor will require that specific Subcontractor's obtain and pay for permits required by authorities having jurisdiction, where their Work is affected by Work requiring permits.
  .3 Constructor shall display building permit and other permits in a conspicuous location at Place of Work.

.2 Occupancy Permits:
  .1 Constructor shall apply for, obtain and pay for occupancy permits, including partial occupancy permits where required by authority having jurisdiction.
  .2 Departmental Representative will issue appropriate instructions to Constructor for correction to Work where Contract Document deficiencies are required to be corrected in order to obtain occupancy permits, including partial occupancy permits.
  .3 Constructor shall correct deficiencies in accordance with Departmental Representative's instructions. Where deficiency is not corrected, Departmental Representative reserves the right to make correction and charge Constructor for costs incurred.
  .4 Constructor shall turn occupancy permits over to Departmental Representative.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 74 00 Cleaning.

.2 All sections of Div 04 Masonry included in this specification document.

.3 All sections of Div 06 Wood, Plastics & Composites included in this specification document.

.4 All sections of Div 07 Thermal & Moisture Protection included in this specification document.

.5 All sections of Div 08 Openings included in this specification document.

.6 All sections of Div 09 Finishes included in this specification document.

.7 Section 31 00 00.01 Earthwork: Short Form.

.8 All sections of Div 32 Exterior Improvements included in this specification document.

1.02 REFERENCE STANDARDS

.1 Not Used.

1.03 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 at no additional cost to the Owner.

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

1.04 INDEPENDENT INSPECTION AGENCIES

.1 Independent Inspection/Testing Agencies will be engaged by Constructor for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Constructor.

.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.

1.05 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.

1.06 PROCEDURES

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

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

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

1.07 REJECTED WORK

.1 Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

.2 Make good other Contractor's work damaged by such removals or replacements promptly.

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

1.08 REPORTS

.1 Submit digital files of inspection and test reports to Departmental Representative.

1.09 TESTS AND MIX DESIGNS

.1 Furnish test results and mix designs as requested.

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

1.10 MOCK-UPS

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

.2 Construct in locations acceptable to Departmental Representative.

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

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

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

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

1.11 MILL TESTS

.1 Submit mill test certificates as required of specification Sections.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 52 00 – Construction Facilities.

1.02 REFERENCE STANDARDS

.1 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.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

1.04 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.05 DEWATERING

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

1.06 WATER SUPPLY

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

.2 Departmental Representative will pay for utility charges at prevailing rates, based on General Conditions of Contract.

1.07 TEMPORARY HEATING AND VENTILATION

.1 Provide temporary heating required if construction period occurs during October through March, including attendance, maintenance and fuel.

.2 Maintain temperatures of minimum 10 degrees Celsius in areas where construction is in progress.

.3 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.

.4 Permanent heating system of building, not to be used.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
.1 Conform with applicable codes and standards.
.2 Enforce safe practices.
.3 Prevent abuse of services.
.4 Prevent damage to finishes.
.5 Vent direct-fired combustion units to outside.

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

1.08 TEMPORARY POWER AND LIGHT

.1 Parks Canada Agency provide and pay for temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.

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

.3 Temporary power for electric cranes and other equipment requiring in excess of above is responsibility of Contractor based on General Conditions of Contract.

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

1.09 TEMPORARY COMMUNICATION FACILITIES

.1 Provide and pay for mobile phone device and service necessary for use of Contractor’s site supervisor.

1.10 FIRE PROTECTION

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

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 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 and erosion control plan, specific to site, that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

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

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

.4 Existing grade must not be displaced by any Construction Facilities more than 150mm. Displacements beyond 150mm will compel archeological considerations arranged by Departmental Representative and conducted at the expense of Constructor.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 11 00 Summary of Work.

.2 Section 01 14 00 Work Restrictions.

.3 Section 01 35 29.06 Health & Safety Requirements.

.4 Section 01 41 00 Regulatory Requirements.

.5 Section 01 74 00 Cleaning.

.6 Section 01 74 19 Waste Management & Disposal.

1.02 REFERENCE STANDARDS

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 1.189-[00], Exterior Alkyd Primer for Wood.

.2 CSA Group (CSA)
- .1 CSA-A23.1/A23.2-[04], Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
- .2 CSA-0121-[M1978(R2003)], Douglas Fir Plywood.
- .3 CAN/CSA-S269.2-[M1987(R2003)], Access Scaffolding for Construction Purposes.
- .4 CAN/CSA-Z321-[96(R2001)], Signs and Symbols for the Occupational Environment.

.3 U.S. Environmental Protection Agency (EPA) / Office of Water
- .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

1.04 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.

1.05 SCAFFOLDING

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

.2 Provide and maintain scaffolding, ramps, platforms, temporary stairs and ground protection.

.3 Existing grade must not be displaced by any Construction Facilities more than 150mm. Displacements beyond 150mm will compel archeological considerations arranged by Departmental Representative and conducted at the expense of Constructor.

1.06 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.

.2 Hoists to be operated by qualified operator.

.3 Existing grade must not be displaced by any Construction Facilities more than 150mm. Displacements beyond 150mm will compel archeological considerations arranged by Departmental Representative and conducted at the expense of Constructor.

1.07 SITE STORAGE/LOADING

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

.2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

.3 Existing grade must not be displaced by any Construction Facilities more than 150mm. Displacements beyond 150mm will compel archeological considerations arranged by Departmental Representative and conducted at the expense of Constructor.

1.08 CONSTRUCTION PARKING

.1 Parking will be permitted on site provided it does not disrupt performance of Work and site operations.

.2 Provide and maintain adequate access to project site.

.3 Clean runways and taxi areas where used by Contractor's equipment.

.4 Existing grade must not be displaced by any Construction Facilities more than 150mm. Displacements beyond 150mm will compel archeological considerations arranged by Departmental Representative and conducted at the expense of Constructor.

1.09 OFFICES

.1 Construction meetings will be held in the existing facility provided by the Departmental Representative on site.

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

location.

.3 Subcontractors to provide their own offices as necessary. Direct location of these offices.

1.10 EQUIPMENT, TOOL AND MATERIALS STORAGE

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

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

1.11 SANITARY FACILITIES

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

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

1.12 CONSTRUCTION SIGNAGE

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

.2 Construction sign 1.22 x 2.44 m, of wood frame and plywood construction painted with exhibit lettering produced by a professional sign painter.

.3 Indicate on sign the names of Consultants and the General Contractor. The design style shall be reviewed by Departmental Representative.

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

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

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

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

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 Departmental Representative.

.3 Provide measures for protection and diversion of traffic, including provision of watch-persons and flag-persons, erection of barricades,

placing of lights around and in front of equipment and work, and erection and maintenance of adequate warning, danger, and direction signs

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

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

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

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

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

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.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 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 that complies with EPA 832/R-92-005 or requirements of authorities having jurisdiction, whichever is more stringent.

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

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

.4 Existing grade must not be displaced by any Construction Facilities more than 150mm. Displacements beyond 150mm will compel archeological considerations arranged by Departmental Representative and conducted at

the expense of Constructor.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 35 29.06 – Health and Safety Requirements.

.2 Section 01 52 00 – Construction Facilities.

.3 Section 01 74 19 - Waste Management and Disposal.

.4 Standards and Guidelines for the conservation of Historic Places in Canada (2010)

1.02 REFERENCE STANDARDS

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

.2 CSA Group (CSA)
  .1 CSA-O121-M1978(R2003), Douglas Fir Plywood.

1.03 INSTALLATION AND REMOVAL

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

.2 Remove from site all such work after use.

1.04 HOARDING

.1 Erect temporary site enclosure using new 1.2 m high snow fence wired to rolled steel "T" bar fence posts spaced at 2.4 m on centre. Provide one lockable truck gate. Maintain fence in good repair.

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

1.05 GUARD RAILS AND BARRICADES

.1 Provide secure, rigid guard rails and barricades around roofs.

1.06 WEATHER ENCLOSURES

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

.2 Close off floor areas where walls are not finished; seal off other openings; enclose building interior work for temporary heat.

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

1.07 DUST TIGHT SCREENS

.1 Provide dust tight screens or partitions to localize dust generating activities, and for protection of workers, finished areas of Work and

public.

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

1.08 ACCESS TO SITE

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

1.09 PUBLIC TRAFFIC FLOW

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

1.10 FIRE ROUTES

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

1.11 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY

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

.2 Be responsible for damage incurred.

1.12 PROTECTION OF BUILDING FINISHES

.1 Provide protection for finished and partially finished building finishes and equipment during performance of Work.

.2 Provide necessary screens, covers, and hoardings.

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

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

1.13 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 All sections of Div 04 Masonry included in this specification document.

.2 All sections of Div 06 Wood, Plastics & Composites included in this specification document.

.3 All sections of Div 07 Thermal & Moisture Protection included in this specification document.

.4 All sections of Div 08 Openings included in this specification document.

.5 All sections of Div 09 Finishes included in this specification document.

1.02 REFERENCE STANDARDS

.1 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.

.2 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.

1.03 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.

1.04 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.

1.05 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 and lumber 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.

1.06 TRANSPORTATION

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

1.07 MANUFACTURER'S INSTRUCTIONS

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

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

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

1.08 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.

1.09 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.

1.10 REMEDIAL WORK

.1 Refer to Section 01 73 00 - Execution Requirements.

.2 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.

.3 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 or 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.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 11 00 Summary of Work.

.2 Section 01 14 00 Work Restrictions.

.3 Section 01 41 00 Regulatory Requirements.

.4 Section 02 41 13 Selective Site Demolition.

.5 Section 31 00 00.01 Earthwork Short Form.

.6 All sections of Division 32 Exterior Improvements contained in this specification document.

1.02 REFERENCE STANDARDS

.1 Departmental Representative's identification of existing survey control points and property limits.

1.03 QUALIFICATIONS OF SURVEYOR

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

1.04 SURVEY REFERENCE POINTS

.1 Existing base horizontal and vertical control points are designated on drawings.

.2 Locate, confirm and protect control points prior to starting site work. Preserve permanent reference points during construction.

.3 Make no changes or relocations without prior written notice to Departmental Representative.

.4 Report to Departmental Representative when reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

.5 Require surveyor to replace control points in accordance with original survey control.

1.05 SURVEY REQUIREMENTS

.1 Establish two permanent bench marks on site, referenced to established bench marks by survey control points. Record locations, with horizontal and vertical data in Project Record Documents.

.2 Establish lines and levels, locate and lay out, by instrumentation.

.3 Stake for fill and topsoil placement, grading and landscaping features.

.4 Stake slopes and berms.

.5 Establish foundation elevations.

1.06 EXISTING SERVICES

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

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

1.07 RECORDS

.1 Maintain a complete, accurate log of control and survey work as it progresses.

.2 On completion of foundations and major site improvements, prepare a certified survey showing dimensions, locations, angles and elevations of Work.

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

1.08 ACTION AND INFORMATIONAL SUBMITTALS

.1 Submit name and address of Surveyor to Departmental Representative.

.2 On request of Departmental Representative, submit documentation to verify accuracy of field engineering work.

.3 Submit certificate signed by surveyor certifying and noting those elevations and locations of completed Work that conform and do not conform with Contract Documents.

1.09 SUBSURFACE CONDITIONS

.1 Promptly notify Departmental Representative in writing if subsurface conditions at Place of Work differ materially from those indicated in Contract Documents, or a reasonable assumption of probable conditions based thereon.

.2 After prompt investigation, should Departmental Representative determine that conditions do differ materially, instructions will be issued for changes in Work as provided in Changes and Change Orders.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Standards and Guidelines for the conservation of Historic Places in Canada (2010)2nd Edition

.2 Section 01 52 00 Construction Facilities.

.3 Section 01 74 00 Cleaning.

.4 Section 01 74 19 Waste Management.

.5 All sections of Div 04 Masonry included in this specification document.

.6 All sections of Div 06 Wood, Plastics & Composites included in this specification document.

.7 All sections of Div 07 Thermal & Moisture Protection included in this specification document.

.8 All sections of Div 08 Openings included in this specification document.

.9 All sections of Div 09 Finishes included in this specification document.

.10 Section 31 00 00.01 Earthwork: Short Form.

.11 All sections of Div 32 Exterior Improvements included in this specification document.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit written request in advance of cutting or alteration which affects:
- .1 Structural integrity of elements of project.
- .2 Integrity of weather-exposed or moisture-resistant elements.
- .3 Efficiency, maintenance, or safety of operational elements.
- .4 Visual qualities of sight-exposed elements.
- .5 Work of Owner or separate contractor.

.3 Include in request:
- .1 Identification of project.
- .2 Location and description of affected Work.
- .3 Statement on necessity for cutting or alteration.
- .4 Description of proposed Work, and products to be used.
- .5 Alternatives to cutting and patching.
- .6 Effect on Work of Owner or separate contractor.
- .7 Written permission of affected separate contractor.
- .8 Date and time work will be executed.

1.03 MATERIALS

.1 Required for original installation.

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

1.04 PREPARATION

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

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

.3 Beginning of cutting or patching means acceptance of existing conditions.

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

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

1.05 EXECUTION

.1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.

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

.3 Uncover Work at Constructor’s expense to install ill-timed Work.

.4 Remove and replace at Constructor’s expense defective and non-conforming Work.

.5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

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

.7 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.

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

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

.10 Fit Work to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

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

1.06 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 35 29.06 Health & Safety Requirements.

.2 Section 01 74 19 Waste Management.

.3 Section 01 77 00 Closeout Procedures.

1.02 REFERENCE STANDARDS

.1 Not Used.

1.03 PROJECT CLEANLINESS

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

.2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

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

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

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

.6 Provide and use marked separate bins according to Section 01 74 19 - Waste Management and Disposal.

.7 Dispose of waste materials and debris off site.

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

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

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

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

.12 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.

1.04 FINAL CLEANING

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

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

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

.4 Remove waste products and debris including that caused by subcontractors.

.5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site, unless approved by Departmental Representative.

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

.7 Clean and polish glass and hardware. Replace broken, scratched or disfigured glass.

.8 Remove stains, spots, marks and dirt from decorative work, walls, windows, roofs and floors, including exterior ramp.

.9 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.

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

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

.12 Remove dirt and other disfiguration from exterior surfaces.

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

.14 Sweep and wash clean paved areas.

.15 Clean roofs, downspouts, and drainage systems.

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

.17 Remove snow and ice from access to building.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section includes requirements for management of construction waste and disposal.

1.02 RELATED REQUIREMENTS

.1 Section 01 31 19 - Project Meetings

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 01 52 00 - Construction Facilities.

.4 Section 01 78 00 - Closeout Submittals.

.5 Section 02 41 13 - Selective Site Demolition.

1.03 REFERENCE STANDARDS

.1 American Society for Testing and Materials (ASTM):
  .1 ASTM E 1609 01, Standard Guide for Development and Implementation of a Pollution Prevention Program

1.04 DEFINITIONS

.1 Clean Waste: Untreated and unpainted; not contaminated with oils, solvents, sealants or similar materials.

.2 Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, re modeling, repair and demolition operations.

.3 Hazardous: Exhibiting the characteristics of hazardous substances including properties such as ignitability, corrosiveness, toxicity or reactivity.

.4 Non hazardous: Exhibiting none of the characteristics of hazardous substances, including properties such as ignitability, corrosiveness, toxicity, or reactivity.

.5 Non toxic: Not poisonous to humans either immediately or after a long period of exposure.

.6 Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

.7 Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

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

.9 Return: To give back reusable items or unused products to vendors for credit.

.10 Reuse: To reuse a construction waste material in some manner on the project site.

.11 Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

.12 Sediment: Soil and other debris that has been eroded and transported by storm or well production run off water.

.13 Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

.14 Toxic: Poisonous to humans either immediately or after a long period of exposure.

.15 Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

.16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:
- .1 Solvents in paints and other coatings;
- .2 Wood preservatives; strippers and household cleaners;
- .3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.
- .4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

.17 Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

.18 Construction Waste Management Plan: A project related plan for the collection, transportation, and disposal of the waste generated at the construction site; the purpose of the plan is to ultimately reduce the amount of material being landfilled.

1.05 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate waste management requirements with all Divisions of the Work for the project and ensure that requirements of the Construction Waste Management Plan are followed.

.2 Preconstruction Meeting: Arrange a pre-construction meeting in accordance with Section 01 31 19 - Project Meetings before starting any Work of the Contract attended by the Departmental Representative, Contractor and affected Subcontractors to discuss the Contractor's Construction Waste Management Plan and to develop mutual understanding of the requirements for a consistent policy towards waste reduction and recycling.

1.06 SUBMITTALS

.1 Provide required information in accordance with Section 01 33 00 -

Submittal Procedures.

.2 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Draft Construction Waste Management Plan (Draft CWM Plan): Submit to Departmental Representative a preliminary analysis of anticipated site generated waste by listing a minimum of five 3 construction or demolition waste streams that have potential to generate the most volume of material indicating methods that will be used to divert construction waste from landfill and source reduction strategies; Departmental Representative will provide commentary before development of Contractor's Construction Waste Management Plan.

.2 Construction Waste Management Plan (CWM Plan): Submit a CWM Plan for this project prior to any waste removal from site and that includes the following information:

.1 Material Streams: Analysis of the proposed jobsite waste being generated, including material types and quantities; materials removed from site destined for alternative daily cover at landfill sites and land clearing debris cannot be considered as contributing to waste diversion and will be included as a component of the total waste generated for the site.

.2 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials and incorporate into CWM Plan.

.3 Alternative Waste Disposal: Prepare a listing of each material proposed to be salvaged, reused, recycled or composted during the course of the project, and the proposed local market for each material.

.4 Landfill Materials: Identify materials that cannot be recycled, reused or composted and provide explanation or justification; energy will be considered as a viable alternative diversion strategy for these materials where facilities exist.

.5 Landfill Options: The name of the landfill where trash will be disposed of; landfill materials will form a part of the total waste generated by the project.

.6 Materials Handling Procedures: A description of the means by which any recycled waste materials will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.

.7 Transportation: A description of the means of transportation of the recyclable materials, whether materials will be site separated and self-hauled to designated centers, or whether mixed materials will be collected by a waste hauler and removed from the site, and destination of materials.

1.07 PROJECT CLOSEOUT SUBMISSIONS

.1 Not used.

1.08 QUALITY ASSURANCE

.1 Resources for Development of Construction Waste Management Report (CWM Report): The following sources may be useful in developing the Draft

Construction Waste Management Plan:
.1 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials and incorporate into CWM Plan.
.2 Waste-to-Energy Systems: Investigate local waste-to-energy incentives where systems for diverting materials from landfill for reuse or recycling are not available.

.2 Certifications: Provide proof of the following during the course of the Work:
.1 Compliance Certification: Provide proof that recycling center is third party verified and is listed as a Certified Facility through the registration and certification requirements of the Recycling Certification Institute.

1.09 DELIVERY, STORAGE AND HANDLING

.1 Storage Requirements: Implement a recycling/reuse program that includes separate collection of waste materials as appropriate to the project waste and the available recycling and reuse programs in the project area.

.2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:
.1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.
.2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.

.3 Hazardous Waste and Hazardous Materials: Handle in accordance with applicable regulations.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 (CWM PLAN) IMPLEMENTATION

.1 Manager: Contractor is responsible for designating an onsite party or parties responsible for instructing workers and overseeing and documenting results of the CWM Plan for the project.

.2 Distribution: Distribute copies of the CWM Plan to the job site foreman, each Subcontractor, the Departmental Representative and other site personnel as required to maintain CWM Plan.

.3 Instruction: Provide onsite instruction of appropriate separation, handling, and recycling, salvage, reuse, composting and return methods being used for the project to Subcontractors at appropriate stages of the project.

.4 Separation Facilities: Lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, composting and return:

.1 Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.

.2 Hazardous wastes shall be separated, stored, and disposed of in accordance with local regulations.

3.02 SUBCONTRACTOR'S RESPONSIBILITY

.1 Subcontractors shall cooperate fully with the Contractor to implement the CWM Plan.

.2 Failure to cooperate may result in the Owner not achieving their environmental goals and may result in penalties being assessed by the Contractor to the responsible Subcontractors.

3.03 SAMPLE CONSTRUCTION WASTE MANAGEMENT FORMS

Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 74 11 - Cleaning.

.2 Section 01 74 19 - Waste Management and Disposal.

.3 Section 01 78 00 – Closeout Submittals.

1.02 REFERENCE STANDARDS

.1 Canadian Environmental Protection Act (CEPA)
  .1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:
  .1 Contractor's Inspection: Contractor: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
    .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
    .2 Request Departmental Representative’s inspection.

  .2 Departmental Representative’s Inspection:
    .1 Departmental Representative and Contractor to inspect Work and identify defects and deficiencies.
    .2 Contractor to correct Work as directed by Departmental Representative.

  .3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:
    .1 Work: completed and inspected for compliance with Contract Documents.
    .2 Defects: corrected and deficiencies completed.
    .3 Equipment and systems: tested, adjusted and fully operational.
    .4 Certificates required by Fire Commissioner submitted.
    .5 Operation of systems: demonstrated to Departmental Representative's personnel.
    .6 Work: complete and ready for final inspection.

  .4 Final Inspection:
    .1 When completion tasks are done, request final inspection of Work by Departmental Representative.
    .2 When Work is incomplete according to Departmental Representative, complete outstanding items and request re-inspection.

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

application for Certificate of Substantial Performance.

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

.7 Final Payment:
.1 When Departmental Representative considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.
.2 When Work deemed incomplete by Departmental Representative, complete outstanding items and request re-inspection.

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

1.04 FINAL CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.
.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 31 19 - Project Meetings.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 01 45 00 - Quality Control.

.4 Section 01 71 00 - Examination and Preparation.

1.02 REFERENCE STANDARDS

.1 Not used.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:
  .1 Convene meeting one week prior to [contract completion] with Departmental Representative, in accordance with Section 01 31 19 - Project Meetings to:
    .1 Verify Project requirements.
    .2 Review warranty requirements.

  .2 Departmental Representative to establish communication procedures for:
    .1 Notifying construction warranty defects.
    .2 Determine priorities for type of defects.
    .3 Determine reasonable response time.

  .3 Contact information for bonded and licensed company for warranty work action: provide name, telephone number and address of company authorized for construction warranty work action.

  .4 Ensure contact is located within local service area of warranted construction, is continuously available, and is responsive to inquiries for warranty work action.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Provide spare parts, maintenance materials and special tools of same quality and manufacture as products provided in Work.

.4 Provide evidence, if requested, for type, source and quality of products supplied.

1.05 FORMAT

.1 Organize data as instructional manual.

.2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.

.3 When multiple binders are used correlate data into related consistent groupings.
  .1 Identify contents of each binder on spine.

.4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.

.5 Arrange content by Specification Divisions and Section, summarized in a Table of Contents.

.6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.

.7 Text: manufacturer's printed data, or typewritten data.

.8 Drawings: provide with reinforced punched binder tab.
  .1 Bind in with text; fold larger drawings to size of text pages.

.9 Provide 1:1 scaled CAD files in dwg format on external flash drive.

1.06 CONTENTS - PROJECT RECORD DOCUMENTS

.1 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.

.2 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.

.3 Typewritten Text: as required to supplement product data.
  .1 Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.07 AS-BUILT DOCUMENTS AND SAMPLES

.1 Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of:
  .1 Contract Drawings.
  .2 Specifications.
  .3 Addenda.
  .4 Change Orders and other modifications to Contract.
  .5 Reviewed shop drawings, product data, and samples.
  .6 Field test records.
  .7 Inspection certificates.
  .8 Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.
  .1 Provide files, racks, and secure storage.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.
.1 Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.
.1 Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Departmental Representative.

1.08 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings and in a copy of Project Manual provided by Departmental Representative.

.2 Use felt tip marking pens, maintaining separate colours for each major system, for recording information.

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

.4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
.1 Measured depths of elements of foundation in relation to finish first floor datum.
.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
.3 Field changes of dimension and detail.
.4 Changes made by change orders.
.5 Details not on original Contract Drawings.
.6 Referenced Standards to related shop drawings and modifications.

.5 Specifications: mark each item to record actual construction, including:
.1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
.2 Changes made by Addenda and change orders.

.6 Other Documents: maintain manufacturer's certifications, inspection certifications and field test records required by individual specifications sections.

.7 Provide digital photos, if requested, for site records.

1.09 FINAL SURVEY

.1 Submit final site survey certificate in accordance with Section 01 71 00 - Examination and Preparation, certifying that elevations and locations of completed Work are in conformance, or non-conformance with Contract Documents.

1.10 EQUIPMENT AND SYSTEMS

.1 Not used.

1.11 MATERIALS AND FINISHES

.1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
  .1 Provide information for re-ordering custom manufactured products.

.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.

1.12 MAINTENANCE MATERIALS

.1 Spare Parts:
  .1 Provide spare parts, in quantities specified in individual specification sections.
  .2 Provide items of same manufacture and quality as items in Work.
  .3 Deliver to location as directed; place and store.
  .4 Receive and catalogue items.
    .1 Submit inventory listing to Departmental Representative.
    .2 Include approved listings in Maintenance Manual.
  .5 Obtain receipt for delivered products and submit prior to final payment.

.2 Extra Stock Materials:
  .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
  .2 Provide items of same manufacture and quality as items in Work.
  .3 Deliver to location as directed; place and store.
  .4 Receive and catalogue items.
    .1 Submit inventory listing to Departmental Representative.
    .2 Include approved listings in Maintenance Manual.
  .5 Obtain receipt for delivered products and submit prior to final payment.

.3 Special Tools:
  .1 Provide special tools, in quantities specified in individual specification section.
  .2 Provide items with tags identifying their associated function and equipment.
  .3 Deliver to location as directed; place and store.
  .4 Receive and catalogue items.
    .1 Submit inventory listing to Departmental Representative.
    .2 Include approved listings in Maintenance Manual.

1.13 DELIVERY, STORAGE AND HANDLING

.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 for review by Departmental Representative.

1.14 WARRANTIES AND BONDS

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

.2 Submit warranty management plan, 15 working days before planned pre-warranty conference, to Departmental Representative for approval.

.3 Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.

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

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

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:
- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within [ten] days after completion of applicable item of work.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.

.7 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.

.8 Include information contained in warranty management plan as follows:
- .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
- .2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include roofs and Windows.
- .3 Provide list for each warranted equipment, item, feature of construction or system indicating:
  - .1 Name of item.
  - .2 Model and serial numbers.

.3 Location where installed.
.4 Name and phone numbers of manufacturers or suppliers.
.5 Names, addresses and telephone numbers of sources of spare parts.
.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
.7 Cross-reference to warranty certificates as applicable.
.8 Starting point and duration of warranty period.
.9 Summary of maintenance procedures required to continue warranty in force.
.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
.11 Organization, names and phone numbers of persons to call for warranty service.
.12 Typical response time and repair time expected for various warranted equipment.

.9 Respond in timely manner to oral or written notification of required construction warranty repair work.

.10 Written verification to follow oral instructions.
.1 Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.

1.15 WARRANTY TAGS

.1 Not used.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 Section includes descriptions for demolishing, salvaging, recycling, and removing site work items identified for removal in whole or in part, and for backfilling trenches and excavations resulting from site demolition activities.

1.02 RELATED REQUIREMENTS

.1 Section 31 00 00.01 – Earthwork – Short Form

1.03 REFERENCE STANDARDS AND GUIDELINES

.1 Department of Justice Canada (Jus)
- .1 Canadian Environmental Assessment Act (CEAA), 2012
- .2 Canadian Environmental Protection Act (CEPA), 2012
  - .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations
  - .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
  - .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
  - .4 Motor Vehicle Safety Act (MVSA), 1995
  - .5 Hazardous Materials Information Review Act, 1985

.2 U.S. Environmental Protection Agency (EPA)
- .1 EPA CFR 86.098-10, Emission standards for 1998 and later model year Otto-cycle heavy-duty engines and vehicles
- .2 EPA CFR 86.098-11, Emission standards for 1998 and later model year diesel heavy-duty engines and vehicles
  - .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices

1.04 DEFINITIONS

.1 Selective Demolition: Sequencing demolition activities to allow separation and sorting of selected site materials.

.2 Hazardous Substances: dangerous substances, dangerous goods, hazardous commodities and hazardous products, including but not limited to: asbestos PCB's, CFC's, HCFC's poisons, corrosive agents, flammable substances, ammunition, explosives, radioactive substances, or other material that can endanger human health or well being or environment if handled improperly.

1.05 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure Work is performed in compliance with applicable Provincial regulations.

.2 Comply with hauling and disposal regulations of authority having jurisdiction.

1.06 SITE CONDITIONS

.1 Environmental protection:
  .1 Ensure Work is done in accordance with the requirements of authorities having jurisdiction.
  .2 Ensure Work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air and noise pollution.
  .3 Fires and burning of waste or materials is not permitted on-site.
  .4 Burying of rubbish waste materials is not permitted.
  .5 Disposal of waste of volatile materials including but not limited to, mineral spirits, oil, petroleum based lubricants, or toxic cleaning solutions into watercourses, storm or sanitary sewers, is not permitted.
  .6 Ensure proper disposal procedures are maintained throughout the project.

.2 Pumping of water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties, is not permitted.

.3 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction.

.4 Protect trees, plants, and foliage on-site and adjacent properties, where indicated.

.5 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.6 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on all temporary roads.

.7 Conduct selective site demolition so Owner's operations will not be disrupted:
  .1 Provide not less than 72 hours' notice to Owner of activities that will affect operations.
  .2 Maintain access to existing walkways, exits, and other adjacent occupied or used facilities:
    .1 Closing or obstructing walkways, exits, or other occupied or used facilities without written permission from Parks Canada Agency is not permitted.

.8 Parks Canada Agency assumes no responsibility for Selective Site elements being demolished:
  .1 Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1.07 EXISTING CONDITIONS

.1 Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work:
  .1 Hazardous materials will be as defined in the Hazardous Materials Act.

.2 If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Parks Canada Agency.

.3 If material resembling spray or trowel applied asbestos or other designated substance listed as hazardous is encountered in course of demolition, stop work, take preventative measures, and notify Project Manager immediately. Proceed only after receipt of written instructions have been received from Project Manager.

.4 Site elements that will be demolished are based on their condition at time of examination prior to tendering.

2 EXECUTION

2.01 EXAMINATION

.1 Survey existing conditions and correlate with requirements indicated to determine extent of selective site demolition required.

.2 Parks Canada Agency does not guarantee that existing conditions are the same as those indicated in Project Record Documents.

.3 When unanticipated mechanical, electrical, or structural elements are encountered, investigate and measure the nature and extent of the element. Promptly submit a written report to Project Manager.

.4 The Contractor shall be responsible to determine the exact location, size, material, and elevation of all services and utilities prior to construction. The Contractor shall protect and assure responsibility for all utilities whether or not shown on the drawings.

2.02 PREPARATION

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

.2 Protection of in-place conditions:
- .1 Prevent movement, settlement, or damage of adjacent structures, services, walks, paving, trees, landscaping, adjacent grades, parts of existing building to remain.
  - .1 Provide bracing, shoring, and underpinning as required.
  - .2 Repair damage caused by demolition as directed by Parks Canada Agency or designate.
- .2 Support affected site elements and, if safety of site element being demolished or adjacent structures or services appears to be endangered, take preventative measures, stop Work, and immediately notify Project Manager.

.3 Prevent debris from blocking surface drainage system, elevators, mechanical and electrical systems which must remain in operation.

2.03 REMOVAL AND DEMOLITION OPERATIONS

.1 Remove items as indicated.

.2 Disruption of items designated to remain in place is not permitted.

.3 Removal of pavements, curbs, and gutters:
- .1 Square up adjacent surfaces to remain in place by saw cutting or other method approved by Project Manager or designate.
- .2 Protect adjacent joints and load transfer devices.
- .3 Protect underlying and adjacent granular materials.

.4 Stockpile topsoil for final grading and landscaping:
- .1 Provide erosion control and seeding if not immediately used.
- .2 Location to be coordinated on-site.

.5 Disposal of Material:
- .1 Dispose of materials not designated for salvage or reuse on-site, as per all applicable local regulations.

.6 Backfill: Backfill in areas as indicated and in accordance with Section 31 00 00.01 - Earthwork Short Form.

2.04 STOCKPILING

.1 Label stockpiles, indicating material type and quantity.

.2 Designate appropriate security resources/measures to prevent vandalism, damage, and theft.

.3 Location of stockpiles to be coordinated on-site.

.4 Stockpile materials designated for alternate disposal in location which facilitates removal from site and examination by potential end markets, and which does not impede disassembly, processing, or hauling procedures.

2.05 REMOVAL FROM SITE

.1 During work remove stockpiled material as directed by Parks Canada Agency or designate, when it interferes with operations of project and/or site operations.

.2 Material testing and disposal of excess soil is to be completed in accordance with notes on drawing C2.1.

2.06 RESTORATION

.1 Restore all disturbed areas to existing or better conditions.

.2 Use soil treatments and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses, or ground water.

2.07 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
  .1 Leave Work area clean at end of each day.
  .2 Remove debris, trim surfaces, and leave work site clean, upon completion of Work.
  .3 Use cleaning solutions and procedures which are not harmful to health, are not injurious to plants, and do not endanger wildlife, adjacent water courses, or ground water.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section includes the following:
  .1 Demolition and removal of selected portions of exterior building components or structural elements.
  .2 Repair procedures for selective demolition operations.

.2 This section does not include the following:
  .1 Removal of hazardous materials or asbestos abatement.
  .2 Demolition of interior building components and finishes.

.3 Drawings contain details that suggest directions for solving some of the major demolition and removal requirements for this project; Contractor is required to develop these details further by submitting a demolition plan prepared by a professional engineer employed by the Contractor.

1.02 RELATED REQUIREMENTS

.1 Section 01 31 19 - Project Meetings.

.2 Section 01 32 16.19 - Construction Progress Schedule.

.3 Section 01 35 29.06 – Health and Safety Requirements.

.4 Section 01 41 00 - Regulatory Requirements.

.5 Section 01 52 00 – Construction Facilities.

.6 Section 01 56 00 – Temporary Barriers and Enclosures.

.7 Section 01 74 00 - Cleaning.

.8 Section 01 74 19 – Waste management and Disposal.

.9 Section 02 41 13 - Selective Site Demolition.

1.03 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 American National Standards Institute (ANSI)- ANSI A10.8 2011, Safety Requirements for Scaffolding

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

.4 National Research Council Canada (NRC)
  .1 National Building Code of Canada [2015] (NBC).

.5 Department of Justice Canada (Jus)
  .1 Canadian Environmental Assessment Act (CEAA), 2012

.2 Canadian Environmental Protection Act (CEPA), 2012
  .1 SOR/2003-2, On-Road Vehicle and Engine Emission Regulations
  .2 SOR/2006-268, Regulations Amending the On-Road Vehicle and Engine Emission Regulations
  .3 Transportation of Dangerous Goods Act (TDGA), 1992, c. 34
  .4 Motor Vehicle Safety Act (MVSA), 1995
  .5 Hazardous Materials Information Review Act, 1985

.6 National Fire Protection Association (NFPA)
  .1 NFPA 241 13, Standard for Safeguarding Construction, Alteration, and Demolition Operations

1.04 DEFINITIONS

.1 Demolish: Detach items from existing construction and legally dispose of them off site, unless indicated to be removed and salvaged or removed and reinstalled.

.2 Remove and Salvage: Detach items from existing construction and deliver them to Departmental Representative.

.3 Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.

.4 Existing to Remain: Existing items of construction that are not removed and that are not otherwise indicated as being removed, removed and salvaged, or removed and reinstalled.

.5 Hazardous Substances: Dangerous substances, dangerous goods, hazardous commodities and hazardous products may include asbestos, mercury and lead, PCB's, poisons, corrosive agents, flammable substances, radioactive substances, or other material that can endanger human health or wellbeing or environment if handled improperly as defined by the Federal Hazardous Products Act (RSC 1985) including latest amendments.

1.05 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Coordinate selective demolition work so that work of this Section adheres to aesthetic criteria established by the Drawings and specified dimensions with all elements in planes as drawn, maintaining their relationships with all other building elements.

.2 Coordination: Coordinate with Departmental Representative for the material ownership as follows:
  .1 Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Departmental Representative's property, demolished materials shall become Contractor's property and shall be removed from Project site.
  .2 Historic items, relics, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, antiques and other items of interest or value to Departmental Representative that may be encountered during selective demolition remain Departmental Representative's property:
    .1 Carefully remove and salvage each item or object in a manner to prevent damage and deliver promptly to Departmental Representative.

.2 Coordinate with Departmental Representative’s historical adviser, who will establish special procedures for removal and salvage.

.3 Pre-Demolition Meeting: Conduct a pre demolition meeting at Project site in accordance with requirements listed in Section 01 31 19 - Project Meetings to confirm extent of salvaged and demolished materials; and to review Contractor's demolition plan.

1.06 ACTION AND INFORMATION SUBMITTALS

.1 Action Submittals: Provide the following submittals before starting any work of this Section:

.1 Schedule of Selective Demolition Activities: Coordinate with Section 01 32 16.19 - Construction Progress Schedule, and indicate the following:

.1 Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity.

.2 Coordinate with Departmental Representative’s ongoing site operations and limit the number of interruptions during regular business hours.

.3 Interruption of utility services.

.4 Coordination for shutoff, capping, and continuation of utility services.

.5 Use of elevator and stairs.

.6 Locations of temporary partitions and means of egress, including for others affected by selective demolition operations.

.7 Coordination with Departmental Representative's continuing occupancy of portions of existing building and of Departmental Representative's partial occupancy of completed Work.

.2 Demolition Plan: Submit a plan of demolition area indicating extent of temporary facilities and supports, methods of removal and demolition prepared by a professional engineer in accordance with requirements of Authority Having Jurisdiction, and as follows:

.1 Proposed Dust Control and Noise Control Measures: Submit statement or drawing that indicates the measures proposed for use, proposed locations, and proposed time frame for their operation. Departmental Representative reserves the right to make modifications where proposed methods interfere with the Departmental Representative ongoing operation.

.2 Inventory: Submit a list of items that have been removed and salvaged after selective demolition is complete.

.3 Landfill Records: Indicate receipt and acceptance of [hazardous wastes by a landfill facility licensed to accept hazardous wastes].

.4 Pre demolition Photographs or Video: Submit photographs or video indicating existing conditions of adjoining construction and site improvements prior to starting Work. Include finish surfaces that may be misconstrued as damage caused by selective demolition operations.

.2 Informational Submittals: Provide the following submittals when requested by the Departmental Representative:

.1 Qualification Data: Submit information for companies and personnel indicating their capabilities and experience to perform

work of this Section including; but not limited to, lists of completed projects with project names and addresses, names and addresses of architects and owners, for work of similar complexity and extent.

1.07 QUALITY ASSURANCE

.1 Regulatory Requirements: Comply with governing environmental notification requirements and regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction and in accordance with the following:
- .1 Ontario Workers' Compensation Boards.
- .2 Ontario Occupational Health and Safety Standards and Programs.

.2 Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project:
- .1 Conform to the Ontario Occupational Health and Safety Act and Regulations.
- .2 Conform to Ontario Workers' Compensation Board Regulations.
- .3 Conform to the local municipal bylaws and regulations governing this type of work.

1.08 SITE CONDITIONS

.1 Departmental Representative will occupy portions of building immediately adjacent to selective demolition area:
- .1 Conduct selective demolition so that Departmental Representative's operations will not be disrupted.
- .2 Provide not less than 72 hours notice to Departmental Representative of activities that will affect Departmental Representative's operations.

.2 Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities and as follows:
- .1 Do not close or obstruct walkways, corridors, or other occupied or used facilities without written permission from authorities having jurisdiction.

.3 Departmental Representative assumes no responsibility for condition of areas to be selectively demolished:
- .1 Conditions existing at time of Pre-Bid Site Review will be maintained by Departmental Representative as far as practical.

.4 Discovery of Hazardous Substances: It is not expected that Hazardous Substances will be encountered in the Work; immediately notify Departmental Representative if materials suspected of containing hazardous substances are encountered and perform the following activities:
- .1 Refer to Section 01 41 00 - Regulatory Requirements for directives associated with specific material types.
- .2 Hazardous materials will be as defined in the Hazardous Materials Act.
- .3 Any hazardous materials will be removed by Departmental Representative before start of the Work.
- .4 If materials suspected of containing hazardous materials are encountered, do not disturb; immediately notify Departmental Representative.

.5 Storage or sale of removed items or materials on site will not be permitted.

.6 Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

.7 Maintain fire protection facilities in service during selective demolition operations.

2 PRODUCTS

2.01 MATERIALS

.1 Temporary Support Structures: Design temporary support structures required for demolition work and underpinning and other foundation supports necessary for the project using a qualified professional engineer registered or licensed in province of the Work.

.2 Repair Materials: Use repair materials identical to existing materials:
- .1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
- .2 Use materials whose installed performance equal or surpasses that of existing materials.
- .3 Comply with material and installation requirements specified in individual technical specification Sections.
- .4 Engage an installer or fabricator with recognized specialized experienced to patch the exposed Work listed below that is damaged during selective demolition:
  - .1 Stonework and stone masonry.
  - .2 Brickwork and brick masonry.
  - .3 Wood shingle roofing.

3 EXECUTION

3.01 EXAMINATION

.1 Verify that utilities have been disconnected and capped.

.2 Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.

.3 Inventory and record the condition of items to be removed and reinstalled and items to be removed and salvaged.

.4 Engage at Contractor’s expense a professional engineer to survey condition of building when removing elements that may result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective demolition operations.

.5 Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

.1 Coordinate existing services indicated to remain and protect them

against damage during selective demolition operations.

.2 Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
  .1 Arrange to shut off affected utilities with utility companies.
  .2 If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.
  .3 Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit after bypassing.

.3 Do not start selective demolition work until utility disconnecting and sealing have been completed and verified in writing.

3.03 PREPARATION

.1 Drain, purge, or otherwise remove, collect, and dispose of chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with selective demolition operations.

.2 Conduct selective demolition and debris removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities:
  .1 Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Departmental Representative and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.
  .2 Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction.
  .3 Protect existing site improvements, appurtenances, and landscaping to remain.
  .4 Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.

.3 Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain in accordance with Section 01 56 00 – Temporary Barriers and Enclosures, and as follows:
  .1 Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
  .2 Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
  .3 Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
  .4 Cover and protect furniture, furnishings, and equipment that have not been removed.

.4 Provide temporary enclosures for protection of existing building and construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities in accordance with Section 01 52 00 - Construction Facilities.
  .1 Provide temporary weather tight enclosure for building exterior.
  .2 Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures.
  .3 Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

.5 Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

.6 Provide and maintain shoring, bracing, or structural support to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished:
  .1 Strengthen or add new supports when required during progress of selective demolition.

3.04 POLLUTION CONTROLS

.1 Dust Control: Provide water mist, temporary enclosures or other suitable methods reviewed and accepted by the Departmental Representative to limit spread of dust and dirt. Comply with governing environmental protection regulations, and as limited below:
  .1 Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
  .2 Wet mop floors to eliminate tracking of dirt, wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.

.2 Remove and transport debris to prevent spillage on adjacent surfaces and areas.

.3 Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

.4 Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.05 SELECTIVE DEMOLITION

.1 Demolish and remove existing construction only to the extent required by restoration work and new construction as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
  .1 Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
  .2 Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not

hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.

.3 Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

.4 Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame cutting operations. Maintain fire watch and portable fire suppression devices during flame cutting operations.

.5 Maintain adequate ventilation when using cutting torches.

.6 Remove decayed, vermin infested, or otherwise dangerous or unsuitable materials and promptly dispose of off site.

.7 Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

.8 Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

.9 Dispose of demolished items and materials promptly.

.10 Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.

.2 Comply with Departmental Representative's requirements for using and protecting, stairs, walkways, loading docks, building entries and other building facilities during selective demolition operations.

.3 Removed and Salvaged Items:

.1 Clean salvaged items.

.2 Pack or crate items after cleaning.

.3 Identify contents of containers.

.4 Store items in a secure area until delivery to Departmental Representative.

.5 Transport items to Departmental Representative's storage area designated by Departmental Representative.

.6 Protect items from damage during transport and storage.

.4 Removed and Reinstalled Items:

.1 Clean and repair items to functional condition adequate for intended re use. Paint equipment to match new equipment

.2 Pack or crate items after cleaning and repairing

.3 Identify contents of containers

.4 Protect items from damage during transport and storage.

.5 Reinstall items in locations indicated.

.6 Comply with installation requirements for new materials and equipment.

.7 Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

.5 Existing Items to Remain:

.1 Protect construction indicated to remain against damage and soiling during selective demolition.

.2 Items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

.6 Below Grade Construction: Demolish foundation walls and other below grade construction including; but not limited to, the following:
- .1 Basements
- .2 Foundation walls
- .3 Footings

.7 Masonry:
- .1 Demolish in small sections
- .2 Cut masonry at junctures with construction to remain, using power driven saw, then remove masonry between saw cuts

.8 Roofing: Remove no more existing roofing than can be covered in one day by new roofing. Refer to Sections 07 31 29 and 07 62 00 for new roofing requirements.

.9 Air Conditioning Equipment: Remove equipment without releasing refrigerants.

3.06 CLOSEOUT ACTIVITIES

.1 Patching and Repairs: Promptly repair damage to adjacent construction caused by selective demolition operations and as follows:
- .1 Patch to produce surfaces suitable for new materials where repairs to existing surfaces are required,
- .2 Completely fill holes and depressions in remaining existing masonry walls remain with an approved masonry patching material applied according to manufacturer's written recommendations.
- .3 Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

.2 Demolition Waste Disposal: Arrange for legal disposal and remove demolished materials to accredited provincial landfill site or alternative disposal site and as follows:
- .1 Promptly dispose of demolished materials.
- .2 Do not allow demolished materials to accumulate onsite.
- .3 Do not burn demolished materials.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 04 03 05.13 Period Masonry Mortaring.

.2 Section 04 03 43.16 Period Stone Replacing.

.3 Section 04 21 13 Brick Masonry.

1.02 REFERENCE STANDARDS

.1 ASTM International (ASTM)
  .1 ASTM C 216-[16], Standard Specification for Facing Brick (Solid Masonry Units Made of Clay or Shale).

.2 CSA Group (CSA)
  .1 CSA A82-[2014], Fired Masonry Brick Made From Clay or Shale.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for brick units and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
  .1 Provide samples of replacement bricks for approval.
    .1 3 of each type of masonry unit specified.
    .2 As required for testing purposes.

.4 Test Reports:
  .1 Provide laboratory test reports
    .1 Submit 3 copies of certified test reports.
    .2 Submit results before ordering replacement bricks.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify masonry, staging and storage areas and notify Departmental Representative in writing of conditions detrimental to acceptable and timely completion of Work.

.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform in writing Departmental Representative areas of deteriorated masonry not previously identified.
.3 Check for evidence of repairs, cracks, moisture, soluble salt contamination and other defects not noted on Contract Drawings, and report to Departmental Representative before starting Work.
.4 Stop work immediately and report to Departmental Representative evidence of hazardous materials.

3.02 APPLICATION

.1 Samples:
.1 Submit 3 samples of brick units for testing to Departmental Representative for review.
.2 Consider identifying the individual bricks so that they can be replaced in the same spot where they were taken from.
.3 Prepare photographic, written and sketch records of wall area where samples are removed, before and after removal, in accordance with criteria set by Departmental Representative.
.4 Remove samples with minimum amount of damage to historic fabric of structure, under supervision of Departmental Representative.
.5 Protect walls from weather damage after removal of samples.
.6 Prevent damage to samples during delivery. Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

.2 Procedure:
.1 Testing Apparatus: in accordance with CSA A82.
.1 Test for Modulus of Rupture.
.2 Test for Compressive Strength.
.3 Tests for Absorption.
.4 Test for Freezing and Thawing.
.5 Test for Initial Rate of Absorption.
.6 Test for Efflorescence.
.7 Test for Measurement of Size.
.8 Test for Measurement of Warpage.

.3 Quality Control:
.1 Inspection and testing of bricks will be carried out by a testing Laboratory approved by Departmental Representative.

3.03 RE-INSTALLATION

.1 Patch areas where brick has been removed for sampling.
.1 Obtain approval of replacement bricks before patching holes.
.2 Reuse original brick in original locations after testing where possible.
.3 Re-install brick with approved mortar mix in accordance with Section 04 03 05.13 – Period Masonry Mortaring.

3.04 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

.3 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 45 00 - Quality Control.

.4 Section 01 61 00 - Common Product Requirements

.5 Section 01 74 00 - Cleaning.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 CSA Group (CSA)
  .1 CAN/CSA-Z94.4-[11(R2016)], Selection, Use, and Care of Respirators.

.3 Department of Justice Canada (Jus)
  .1 Canadian Environmental Assessment Act (CEAA), 2012.
  .2 Canadian Environmental Protection Act (CEPA), 1999.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (SDS).

.5 Transport Canada (TC)
  .1 Transportation of Dangerous Goods Act, (1992, c. 34).

1.03 DEFINITIONS

.1 Low-pressure water soaking: less than 72 kPa (500 psi), measured at nozzle tip.
  .1 Medium-pressure water soaking: minimum 72 kPa (500 psi) and maximum 144 kPa (1000 psi), measured at nozzle tip.

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Provide time and allow attendance of relevant employees at environmental briefing session arranged by Departmental Representative.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Product Data:
  .1 Provide technical data on cleaning materials, equipment, machinery, compressors, tools and nozzles.
  .2 Submit 2 copies of WHMIS SDS in accordance with Section

01 35 29.06 - Health and Safety Requirements.

.4 Test and Evaluation Reports:
.1 Provide test results.
.1 Provide digital files of test results describing cleaning method, tools and nozzle size and distance from masonry surface used for cleaning of test patches.
.2 Proceed with cleaning upon receiving approval by Departmental Representative concerning tested cleaning methods.

1.06 QUALITY ASSURANCE

.1 Regulatory Requirements: ensure work is performed in compliance with CEPA CEAA and applicable Provincial regulations.

.2 Comply with requirements of Workplace Hazardous Materials Information Sheet (WHMIS).

.3 Mock-ups:
.1 Do mock-up tests in accordance with Section 01 45 00 - Quality Control.
.2 Notify Departmental Representative before commencing cleaning of each test patch.
.1 Obtain approval from Departmental Representative before commencing test.
.3 Before proceeding with mock up:
.1 Ensure area of testing is water tight and decorative elements are protected.
.2 Ensure contaminated water is kept in containers and their disposal respects environmental regulations.
.4 Conduct tests on building to determine effectiveness of scrubbing with neutral pH detergent in warm water, low pressure wash and moderate pressure wash cleaning methods.
.5 Conduct tests to determine effectiveness of water temperatures, types of nozzles and spraying distances from wall surface.
.6 Start with lowest impact tests and stop testing when desired level of cleaning is achieved. Stop testing immediately when damage is caused.
.7 Test brushing and spraying as alternative to pressure washing. Departmental Representative to review test results. Use method approved by Departmental Representative.
.8 Add increasing amount of surfactant until cleaning can be done efficiently.
.9 Areas to be test cleaned to include Brick Barracks north wall stone foundation and brick walling.
.10 Locate test patches in inconspicuous places directed by Departmental Representative.
.11 Test patches: $1m^2$.
.12 Conduct tests to determine best methods of protecting surrounding historic material, openings and plants during test cleaning procedure, and monitor for detrimental effects.
.13 Proceeding with work without approval of mock-up is prohibited.
.14 Allow 72 hours for inspection of mock-up by Departmental Representative.
.15 Accepted mock-up will demonstrate minimum standard for work. Mock-up may remain as part of finished work.

1.07 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

1.08 SITE CONDITIONS

.1 Ambient conditions:
- .1 Avoid the use of wet cleaning methods when there is threat of frost.
- .2 Avoid the use chemical cleaners when temperature is below 10 degrees C.
- .3 Follow manufacturer's written instructions on use of chemical cleaners in accordance with product's temperature range application.
- .4 Provide shading to wall to avoid cleaning in full, hot sunlight.
- .5 Avoid clean if there is risk of chemical spray being blown onto surrounding historic material, publicly accessible areas or plants.
- .6 Protect work in the event of high winds.

2 PRODUCTS

2.01 MATERIALS

.1 Use clean potable water free from contaminants.

.2 Treat water which has high metal content before use in cleaning.

.3 Use air free from oil or other contaminants.

.4 Use strippable masking material to approval of Departmental Representative.

.5 Use non-ionic surfactant (detergent) in concentration less than 2% by volume.

.6 Use hydrofluoric acid (HF) based cleaner in concentration less than 5% by volume. Include Orthophosphoric acid 0.25% by volume.

.7 Use ammonium hydroxide (ammonium) based cleaner for calcareous stone.

.8 Use sodium hexametaphosphate (Calgon or NaHMP) to dissolve gypsum-bound soiling.

.9 Use xylene to remove graffiti and other stains.

.10 Use 2-5% ammonium carbonate solution in water in poultice pack to treat copper stains.

.11 Use Fuller's Earthas poultice medium.

.12 Use non-ferrous or plastic mesh as support mechanism for poultice.

.13 Use glycerine as thickener to slow evaporation.

.14 Use Aluminum Oxide grits for fine work.

.15 Prepare poultices to treat iron stains on sandstone and granite using:
.1 10% solution by weight of orthophosphoric acid or oxalic acid and 2% sodium salt of EDTA.

.16 Prepare poultices to treat iron stains on limestone and marble using:
.1 7 parts glycerine, 1 part sodium citrate and 6 parts warm water.

.17 Use ammonium hydroxide in poultices to remove grease stains.

.18 Use non-siliceous 70 mesh grit free from iron oxide.

2.02 TOOLS AND EQUIPMENT

.1 Use brushes with natural or soft plastic bristles.

.2 Use scrapers of wood or plastic.

.3 Use water pumps fitted with accurate pressure regulators and gauges capable of being preset and locked at maximum specified levels.

.4 Use air compressors equipped with on-line oil filters to avoid spraying oil onto masonry.

.5 Use gun equipped with pressure gauge at nozzle end.

.6 Use plastic or non-ferrous metal piping and fittings.

.7 Use nozzles that give nebulized droplet spray. Use nozzles with 375 mm spread.

3 EXECUTION

3.01 SITE VERIFICATION OF CONDITIONS

.1 Record existing conditions, by means of photographs, before and after cleaning. Advise Departmental Representative of potential complications.

.2 Report to Departmental Representative conditions of deteriorated masonry or pointing not noted on Contract Drawings found before and during cleaning.

.3 Obtain approval of Departmental Representative before cleaning areas of deteriorated masonry.

3.02 PREPARATION

.1 Protect operatives and other site personnel from hazards.
  .1 Ensure good ventilation in work area.
  .2 Ensure workers wear face protection and protective gloves, coveralls and respirator to CAN/CSA-Z94.4

.2 Place safety devices and signs near work areas as indicated and directed.

.3 Repair openings and joints prior to cleaning where there is potential risk of water/chemical infiltration.

.4 Provide a shelter around work area as directed by Departmental Representative.
  .1 Obtain approval of sheltering method from Departmental Representative before commencing cleaning procedure.

3.03 PROTECTION OF IN-PLACE CONDITIONS

.1 Cover and protect surfaces and non-masonry finishes not to be cleaned.
  .1 Obtain approval of protection method from Departmental Representative before commencing cleaning procedure.

.2 Protect vents, windows, and other openings, to prevent water entry.
  .1 Protect masonry openings from water/chemical infiltration with polyethylene during cleaning.

.3 Protect wood, glass, and metal adjacent to masonry.

.4 Protect plants, gardens and shrubs from watering and chemicals.

.5 Protect cleaned surfaces to be painted from contact with rain and snow.

.6 Protect rainwater leaders, eaves troughs and gutters from being blocked by residue.

.7 Protect adjacent Work from spread of dust and dirt beyond work areas.

.8 Protect building envelope from water infiltration.

3.04 EXECUTION OF CLEANING

.1 Proceed with cleaning in accordance with written instructions of methods, systems, tools and equipment approved by Departmental Representative.

.2 Dry brush or scrape accumulations from walls, ledges and cornices.

.3 Pre-wet masonry surface when necessary. Work from bottom of wall upwards.

.4 Avoid exceeding maximum pressure at nozzle or having nozzle closer to masonry than approved by Departmental Representative at tests.

.5 Stop work when cleaning has detrimental effect on surrounding material and plants.

.6 Avoid prolonged wetting and excessive water penetration.

.7 Apply chemical cleaners approved by Departmental Representative based on tests.

.8 Brush and scrape only to supplement water washing.

.9 Undertake prolonged water spray to soften and loosen heavy deposits, then brush. Remove thick incrustations with wooden or plastic scrapers.

.10 Apply poultices as approved by Departmental Representative based on tests.

.11 Removal of vegetation or organic growth growing in or on masonry.
- .1 Soak masonry with low-pressure water.
- .2 Follow soaking by gentle scrubbing with natural bristle brushes.

.12 Low-Pressure Water Soaking:
- .1 Remove stains and accumulated dirt with low-pressure wash-down.
- .2 Hold nozzle minimum 450 mm from masonry surface.
- .3 Use lower pressure on cut stone, tooled stone and carved work.
- .4 Follow soaking by gentle scrubbing with natural bristle brushes.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
- .1 Leave Work area clean at end of each day.

.2 Rinse off masonry until no indications of chemicals are present.

.3 Rinse from bottom to top and from top to bottom.

.4 Clean up work area as work progresses. At end of each work day remove debris and waste from site.

.5 Upon completion, clean and restore areas used for work to condition equal to that previously existing.

.6 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.06 PROTECTION OF WORK

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

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 01 74 00 - Cleaning.

1.02 ALTERNATIVES

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

1.03 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 ASTM International (ASTM)
- .1 ASTM C 5-[10], Standard Specification for Quicklime for Structural Purposes.
- .2 ASTM C 144-[11], Standard Specification for Aggregate for Masonry Mortar.
- .3 ASTM C 185-[15a], Standard Test Method for Air Content of Hydraulic Cement Mortar.
- .4 ASTM C 207-[06(2011)], Standard Specification for Hydrated Lime for Masonry Purposes.
- .5 ASTM C 260/C 260M-[10a (2016)], Standard Specification for Air-Entraining Admixtures for Concrete.
- .6 ASTM C 270-[14a], Standard Specification for Mortar for Unit Masonry.
- .7 ASTM C 780-[15a], Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- .8 ASTM C 1072-[13e1], Standard Test Method for Measurement of Masonry Flexural Bond Strength.

.3 CSA Group (CSA)
- .1 CSA A23.1/A23.2-[09 (2014)], Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CAN/CSA-A179-[14], Mortar and Grout for Unit Masonry.
- .3 CAN/CSA-A3000-[13], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for mortar and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Prior to mixing or preparation of mortars submit for review to Departmental Representative confirmation of source or product data sheet of:
    .1 Aggregate.
    .2 Cement.
    .3 Lime.
    .4 Premixed products.
    .5 Pigments.

.3 Samples:
  .1 Provide samples in quantity and size in accordance with CAN/CSA-A179.

.4 Test reports:
  .1 Submit test results during site work as directed by Departmental Representative's as follows:
    .1 Sieve analysis: sand.
    .2 Bulking analysis: sand.
    .3 Air content: mortar mix in plastic state.
    .4 Vicat cone penetration: mortar mix.
    .5 Mortar compressive strength: at 7 and 28 days or otherwise required.

1.05 QUALITY ASSURANCE

.1 Qualifications:
  .1 Mechanics to have minimum of 5 years’ experience in lime mortar preparation.
  .2 Mix mortar by same mechanics throughout project.

.2 Mock-ups:
  .1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
  .2 Submit methods of reproducing existing mortar colour, texture and pointing types, and samples.
  .3 Construct mock-up 1000 x 1000 mm.
  .4 Mock-up will be used:
    .1 To judge quality of work, substrate preparation, and material application.
    .2 For testing to determine compliance with performance requirements.
  .5 Locate as directed by Departmental Representative.
  .6 Notify Departmental Representative before commencing mock-up.
    .1 Obtain approval from Departmental Representative before commencing mock-up.
  .7 Allow 72 hours for inspection of mock-up before proceeding with work.
  .8 When accepted, mock-up will demonstrate minimum standard for this Work. Approved mock-up will remain as part of finished work.

1.06 DELIVERY, STORAGE AND HANDLING

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

instructions.

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

.3 Storage and Handling Requirements:
.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store cementitious materials and aggregates in accordance with CSA A23.1/A23.2.
.3 Store lime putty in plastic lined sealed drums.
.4 Protect from weather, freezing and contamination.
.5 Remove rejected or contaminated material from site.
.6 Store and protect mortar materials from nicks, scratches, and blemishes.
.7 Replace defective or damaged materials with new.

1.07 SITE CONDITIONS

.1 Ambient Conditions:
.1 Provide weather-tight enclosure to store materials and mix mortars, maintain air temperature above 10 degrees C at all times.
.2 Maintain maximum/minimum thermometers and relative humidity gauges on site and in enclosures.
.1 Maintain a daily record of temperature and humidity.

.2 Install relative humidity and temperature equipment, record temperature and relative humidity and submit report to Departmental Representative.

2 PRODUCTS

2.01 MATERIALS

.1 Water: potable, clean and free from contaminants.

.2 Sand: to CAN/CSA-A179.

Sieve Size	Percentage by Weight retained on each sieve	Percentage by weight passing each sieve
No. 4 (4.75 mm)	00	100
No. 8 (2.36 mm)	10	90
No. 16 (1.18 mm)	20	70
No. 30 (600 microns)	20	50
No. 50 (300 um)	20	30
No. 100 (150 um)	15	15
No. 200 (75 um)	15	0

.1 Sharp, screened and washed pit sand, free of organic material.
.2 Custom blend sands where necessary to provide appropriate colour match and gradation.

.3 Portland cement: to CAN/CSA-A3000.

.4 Masonry cement: to CAN/CSA-A3000.

.5 Lime:
- .1 Processed Lime (Quicklime): to ASTM C 5, fresh, finely ground and crushed; high calcium, 3/16" fines, dry bagged.
- .2 Hydrated Lime:
  - .1 Dolomitic finishing lime, Type "S", to ASTM C 207.
  - .2 Hydrated, high calcium, Type "N" masons' lime to ASTM C 207.
- .3 Air-entrained dolomitic lime.
- .4 Lime putty.

.6 Colour:
- .1 Ground coloured natural aggregates and coloured sand to match existing. Use minimum amount necessary.
- .2 Maximum colour: 2% of total volume of aggregate.
- .3 Match core of freshly broken sample of original mortar.
- .4 Coloured admixtures: maximum 15% of binder content by mass.

.7 Additives:
- .1 Obtain written approval of Departmental Representative before using additives.

.8 Air entrainment:
- .1 Vinsol resin type: to ASTM C 260/C 260M.

.9 Mortar mill:
- .1 Mortar mill comprising mortar pan with adjustable cast iron sprung rollers on cranked roller shaft, steel scrapers and blades for lime putty mixing.

.10 Spiral paddle mill comprising a mechanically driven rotating barrel with integral internal paddles for other than lime putty mixing
- .1 Each batch add up to 6 large stones to tumble and pound mortar during mixing process.

.11 Plasterer's metal troughs.

2.02 MORTAR MIXES

Mortars are based on the proportion specifications of CSA A179M-1994.

1. Mix A - Mortar for bedding and backpointing stone:

- .1 Performance Requirements:
  - .1 Classification (ASTM C270): Type N.
  - .2 Minimum 7 day Strength: 1 MPa field test (2.4 MPa laboratory)
  - .3 Minimum 28 day Strength: 2 MPa field test (5.2 MPa laboratory)
  - .4 Air entrainment: 8-10% (wet)
  - .5 Consistency (cone penetration): 25 - 35mm
  - .6 Water content: < 15%

- .2 Preliminary Formulation (by volume):
  - .1 1-part Cement : 2-parts Lime Putty : 6-parts Aggregate
  - .2 Mixing procedure: Wet Batching Method

- .3 Materials:
  - .1 Cement: White Portland Cement
  - .2 Rebuilding Mortar Aggregate: Coarse Mortar Sand

2. Mix B - Mortar for pointing stone:

.1 Performance Requirements:
1. Classification (ASTM C270): Type O
2. Minimum 7-day strength: 1.5 MPa
3. Minimum 28-day strength: 2.4 MPa
4. Air-entrainment: 10 - 12% wet
5. Consistency: 15 - 25 mm
6. Water Content: < 12%

.2 Initial Formulation (by volume):
.1 Dark: 1-part Hydraulic Lime : 3-parts Aggregate : Pigment
.2 Medium: 1-part Hydraulic Lime : ½-part Lime : 3½-parts aggregate : Pigment.
.3 Light: 1-part Hydraulic Lime : 1-part Lime Putty : 4-parts Aggregate : Pigment.
.4 Very Light: 1-part Hydraulic Lime : 3-parts Stone Dust : Pigment

.3 Materials:
.1 Aggregate: Fine Mortar Sand
.2 Stone Dust: Buff Berea Sandstone ground to sieve specification
.3 Pigment: as required to accurately match the surrounding stone colour

3. Mix C - Mortar for pointing stone in exposed zones (existing calcerous or new siliceous):

.1 Performance Requirements:
.1 Classification (ASTM C270) - Type N
.2 Minimum 7 day strength: 3 MPa (435 psi)
.3 Minimum 28 day strength: 4 MPa (580 psi)
.4 Air-entrainment: 12-14% (reduce sand volume by air content)
.5 Consistency: 25-35 mm
.6 Water Content: <12%

.2 Formulation (by volume):
.1 Mix Formula: 1 cement : ¼ lime : ½ fly ash : 4 aggregate :
.2 Roughage: ½ lime : 4 aggregate
.3 Gauging Mix: 1 cement : ½ fly ash : weight equivalent of roughage
.4 Air entrainment: (Daravair - 175 ml for 30 Kg cement)

.3 Materials:
.1 Cement: White Masonry Cement, Type N
.2 Lime: Hydrated Type N Lime
.3 Aggregate: Fine Mortar Sand
.4 Stone Dust: Buff Berea Sandstone ground to sieve specification
.5 Pigment: as required to accurately match the surrounding stone colour
.6 Set-additive: Fly ash

4. Mix D - Mortar for pointing stone in exposed zones (arkosic):

.1 Performance Requirements:
.1 Classification (ASTM C270): Type N.
.2 Minimum 7 day Strength: 1 MPa field test (2.4 MPa

laboratory)
.3 Minimum 28 day Strength: 2 MPa field test (5.2 MPa laboratory)
.4 Air entrainment: 8-10% (wet)
.5 Consistency (cone penetration): 25 - 35mm
.6 Water content: < 15%

.2 Preliminary Formulation (by volume):
.1 1-part Cement : 2-parts Lime Putty : 6-parts Aggregate
.2 Mixing procedure: Wet Batching Method

.3 Materials:
.1 Cement: White Portland Cement
.2 Aggregate: Fine Mortar Sand
.3 Stone Dust: Buff Berea Sandstone ground to sieve specification
.4 Pigment: as required to accurately match the surrounding stone colour

5. Mix E - Repair mortars for carrying out mortar fills to existing stone:

.1 Performance Requirements:
.1 Classification (ASTM C270): Type K.
.2 Minimum 28 day Strength: 0.5 MPa (75 psi.)
.3 Air entrainment: 8 - 10% at time of mixing, 6 - 8% when installed and cured.
.4 Consistency (cone penetration): 25-30 mm
.5 Water content: <12%

.2 Formulation:
.1 Mix Formula: 2 Lime - 5 Aggregate

.3 Materials:
.1 Lime: Lime Putty
.2 Aggregate: Mortar Sand
.3 Stone Dust: Buff Berea Sandstone ground to sieve specification

6. Mix F - Rebuild mortars for carrying out rebuilding of existing stone and brick masonry:

.1 Performance Requirements:
.1 Classification (ASTM C270): Type N.
.2 Minimum 7 day Strength: 1 MPa field test (2.4 MPa laboratory)
.3 Minimum 28 day Strength: 2 MPa field test (5.2 MPa laboratory)
.4 Air entrainment: 8-10% (wet)
.5 Consistency (cone penetration): 25 - 35mm
.6 Water content: < 15%

.2 Preliminary Formulation (by volume):
.1 1-part Cement : 2-parts Lime Putty : 6-parts Aggregate
.2 Mixing procedure: Wet Batching Method

.3 Materials:
.1 Cement: White Portland Cement

.2 Rebuilding Mortar Aggregate: Coarse Mortar Sand

2.03 COLOURED MORTAR

.1 Use sand as colouring agent.

.2 Maintain one mortar mixer exclusively for coloured mortar.

2.04 ALLOWABLE TOLERANCES

.1 See individual mortar mix strength requirements in “performance requirements” of 2.02 Mortar Mixes.

.2 If mortar fails to meet 7 day compressive strength requirements, but meets 28 day compressive strength requirement, it is acceptable. If mortar fails to meet 7 day compressive strength requirement, but its strength at 7 days exceeds two thirds of value required for 7 day strength, contractor may elect to continue work at his own risk while awaiting results of 28 day tests, or to take down work affected.

3 EXECUTION

3.01 GENERAL PREPARATIONS

.1 Traditional Mortar:
.2 Prepare measuring boxes to ensure accurate proportioning of materials.
.3 Maintain separate measuring boxes for each component.
.4 Ensure sand is tested and volume corrected for bulking.
.5 Ensure air entraining agent is available together with a graduated container for accurate volume measurements.
.6 Ensure testing equipment is ready and in working order.
.7 Apply Vicat cone test to ensure desirable performance of mortar and record results.

.2 Premixed Mortar:
.1 Follow manufacturer's written instructions.
.2 Whole bag has to be prepared.
.3 Apply Vicat cone test to ensure desirable performance of mortar and record results.

3.02 BULKING OF SAND

.1 Test sand for bulking:
.1 At start of work.
.2 After each new delivery of sand.
.3 After severe change in weather.

.2 Test and adjust sand quantities for bulking:
.1 Obtain sample of sand which accurately reflects average condition of pile of damp sand, as follows:
.1 Take 4 shovels full of sand, each from a different level of pile, and mix thoroughly.
.2 Place sand in a conical pile and divide into 4 quarters with a board. Remove 2 opposite quarters from pile, and combine remaining 2 quarters and mix thoroughly.

.3 Repeat quartering and mixing procedure until a sample of size required for testing remains.

.2 Fill a 1-litre capacity jar, about two-thirds full with damp sand to be tested. Drop sand in loosely. Do not pack it in. Level off surface, measure depth of damp sand (D).
.1 Carefully empty sand into another container, and half fill first container with water.
.2 Pour back about half of test sample of sand slowly into water so it is entirely saturated. Rod it thoroughly to remove air.
.3 Add rest of sand, rodding again to remove air and level off surface. Measure depth of saturated sand (S), which will be less than depth of damp sand.
.4 Calculate percentage bulking using formula: [(D-S) x 100%]/S = percentage bulking; where D = depth of damp sand, and S = depth of saturated sand.

.3 Increase volume of sand by percentage bulking shown in test.

3.03 PREPARATION OF MORTAR

.1 Lime Mortar:
.1 Prepare measuring boxes to ensure accurate proportioning of dry lime putty and sand.
.2 Mix dry lime and sand thoroughly in mortar mill, or spiral- blade mechanical mixer for minimum 3 minutes. Do not add water. No spots or streaks of lime to remain upon completion of mixing.
.3 Add water as required.

.2 Lime-Cement Mortar:
.1 Prepare measuring boxes to ensure accurate proportioning of dry lime putty and sand.
.2 Mix dry cement, lime and sand thoroughly in mortar mill, or spiral- blade mechanical mixer for minimum 3 minutes. Do not add water. No spots or streaks of lime to remain upon completion of mixing.
.3 Add water as required.

.3 Lime Putty Mortar:
.1 Prepare lime putty from hydrated mason's lime by adding dry bagged hydrated lime to water. Stir and hoe mass to form a thick cream.
.2 Seal containers.
.3 Label and date all containers.
.4 Keep prepared material from freezing. Discard frozen material.
.5 Allow to stand at least 48 hours in covered containers before use, preferably longer.
.6 Take lime putty from bins, siphon off water by screening lime through muslin, or cheesecloth, to remove excess water. Rework lime without adding water until it regains its plasticity by beating, ramming and chopping.
.7 Adjust sand for bulking as described in article 3.2.
.8 Mix lime putty with sand as required.

3.04 MIXING

.1 General:
  .1 Use batching box.
  .2 Follow proper batching procedure.
  .3 Monitor mixing time.

.2 Mortar:
  .1 Mix Characteristics:
    .1 Pointing mortar: slightly stiffer than bedding mortar with a consistency such that mortar can be hand-formed into a stiff ball.
    .2 Record amount of water required to reach this consistency and use for subsequent mixes.
  .2 Prepare only enough mortar to be used within two hours. Do not retemper mortar beyond this time.

.3 Follow manufacturer instructions when premixed mortar is used.

.4 Contractor to appoint 1 individual to mix mortar for duration of project. If this individual is changed, mortar mixing to cease until new individual is trained, and mortar mix is tested.

3.05 CONSTRUCTION

.1 Do masonry mortar and grout work in accordance with CAN/CSA-A179 except where specified otherwise.

3.06 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

.3 Remove droppings and splashings using clean sponge and water.

.4 Clean masonry with low pressure clean water and soft natural bristle brush.

.5 Obtain approval of Departmental Representative prior to using other cleaning methods for persistent stains.

3.07 PROTECTION OF COMPLETED WORK

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.

.2 Enclose and protect work using wetted burlap.

.3 Cover with waterproof tarps to prevent weather from eroding recently laid material.
  .1 Maintain tarps in place for minimum of 1 week after laying.
  .2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.4 Anchor coverings securely in position.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 61 00 - Common Product Requirements.

.3 Section 01 74 00 - Cleaning.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 CSA Group (CSA)
- .1 CSA A23.1/A23.2-[09(R2014)], Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
- .2 CAN/CSA-A179-[14], Mortar and Grout for Unit Masonry.
- .3 CSA-A3000-[13], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005).

1.03 DEFINITIONS

.1 Grout: cementitious or epoxy mixture of liquid consistency suitable for pouring or pumping, to fill voids between masonry elements.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for [grout] and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
- .1 Submit grout samples to CAN/CSA-A179.

.4 Source Quality Control Submittals:
- .1 Submit purchase orders, invoices, supplier's test certificates and documents to prove materials used in contract meet requirements of specification.
- .2 Allow free access to source where materials procured.

.5 Field Quality Control Submittals:
- .1 Submit written description of methodology and equipment list, at least 5 working days before beginning of grout work.

1.05 QUALITY ASSURANCE

.1 Preconstruction Testing:
- .1 Cementitious grout compression strength minimum 2.0 MPa, cured for 7 days.

1.06 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store materials at temperatures between 5 degrees C to 38 degrees C unless otherwise stated by manufacturer.
- .3 Replace defective or damaged materials with new.

1.07 SITE CONDITIONS

.1 Ambient conditions:
- .1 Maintain temperature of masonry elements to be grouted above 5 degrees C throughout their thickness, during and 48 hours after grouting.
- .2 Maintain temperature of elements to be grouted between 21 to 24 degrees C throughout its thickness during and 48 hours after grouting.
- .3 Provide and maintain temporary enclosure and cooling equipment to maintain specified temperatures.

2 PRODUCTS

2.01 MATERIALS

.1 Portland cement: to CSA-A3000.

.2 Water: clean and free from contaminants and organic material in accordance to CSA A23.1/A23.2.

.3 Sand: damp loose sand in accordance with CSA A23.1/A23.2.

.4 Lime: hydrated lime in accordance with CSA A23.1/A23.2.

.5 Fly-ash: premium grade pulverized fly ash, type non-metallic in accordance with CSA A23.1/A23.2.

2.02 EQUIPMENT

.1 Mechanical mixer: size compatible with volume of mortar grout prepared.

.2 Mechanical regulator to prevent segregation of ingredients after mixing and ensure injection continuity.

.3 Injection pump to include motor, gears and two separate reservoirs for resin and hardener. Set gear ratio to feed injection gun to recommended proportions, using two separate conduits.

.4 Maintain mixing equipment in good working order. Ensure that necessary spare parts are available on site.

2.03 CEMENTITIOUS GROUT

.1 Mix mortar grout to following proportions by volume.
- .1 Mix 1: Fine Grout
  - .1 1 part Portland cement.
  - .2 2 parts hydrated lime.
  - .3 .5 parts fly ash.
  - .4 1.5 parts damp loose sand
  - .5 5 to 7 parts water (depending on viscosity required.
- .2 Mix 2: Course Grout
  - .1 1 part Portland cement.
  - .2 2 parts hydrated lime.
  - .3 .5 parts fly ash.
  - .4 1.5 parts damp loose sand.
  - .5 5 to 7 parts water (depending on viscosity required.
  - .6 1 to 2 parts pea gravel.

2.04 EPOXY GROUT MIXES

.1 Mix resin and catalyst in accordance with manufacturer's instructions.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for grout installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate.
- .2 Report to Departmental Representative before start of work possible structural masonry problems and conditions that do not conform to those specified including existing voids or possible openings which risk being compromised when grout will flow.
- .3 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .4 Proceed with installation only after unacceptable conditions have been remedied.

3.02 INSPECTION

.1 Provide required assistance to facilitate taking of grout samples and inspection work.

.2 Inspect surfaces of structure before commencing injection work.

3.03 CONDITION OF SURFACES

.1 Evaluate moisture content of masonry work by taping 3 x 3 m polyethylene sheet to masonry surface. If moisture collects on underside of sheet before epoxy would cure, allow masonry work to dry sufficiently before commencing injection work.

3.04 MEASUREMENT AND MIXING

.1 Make volume measurement using suitably gauged hopper of size compatible with volume of grout prepared.

.2 Keep volume measures clean and free from crusting.

.3 Periodically check the shovel count against gauge box.

.4 Use manufacturer's mass density information in making mass measurement to proportion mortar grout.

.5 Mix cementitious materials, admixtures and aggregates in mechanical mixer for period of not less than 5 minutes nor more than 10 minutes with specified amount of water.

.6 Use grout before it has begun to set.

.7 Mix resin and hardener by feeding injection gun in controlled proportions using two conduits according to manufacturer's instructions.

3.05 PREPARATION

.1 Ensure substrate is free from loose material.

.2 Prepare voids around doors and windows to control flow of grout.

.3 Prepare joints before grout injection:
- .1 Insert hemp ropes into joints.
- .2 Point joints.

.4 Wet surfaces, deep into substrate.

3.06 INSTALLATION

.1 Safety:
- .1 Epoxy materials may be skin irritants or sensitizers. Avoid contact with eyes, skin, inhalation of vapours and ingestion.

.2 Insert tubes.

.3 Seal leaks with quick-setting cement.

3.07 FIELD QUALITY CONTROL

.1 Take two samples of grout and submit for testing in accordance with paragraph 1.5 of this section.

3.08 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
- .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 01 74 00 - Cleaning.

.5 Section 04 03 05.13 - Period Masonry Mortaring.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 CSA Group (CSA)
  .1 CSA A23.1/A23.2-[09(R2014)], Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.
  .2 CAN/CSA-A179-[04], Mortar and Grout for Unit Masonry.

.3 ASTM International
  .1 ASTM C 1713-[15] Standard Specification for Mortars for the Repair of Historic Masonry

1.03 DEFINITIONS

.1 Raking: removal of loose/deteriorated mortar to a depth suitable for repointing until sound mortar, and/or 4x joint thickness and/or a specified mm depth is reached.

.2 Repointing: filling and finishing of masonry joints from which mortar is missing, has been raked out or has been omitted.

.3 Back Pointing: repointing to depths greater than minimum raked depths specified, to bring mortar face to specified depth for raked joints.

.4 Finish Pointing: repointing face of joint, to depth specified for raked joints.

.5 Tooling: finishing of masonry joints using tool to provide final contour.

.6 Low-pressure water cleaning: water soaking of masonry using less than 350 kPa (50 psi) water pressure, measured at nozzle tip of hose.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature

and data sheets for mortar and grout including product characteristics, performance criteria, physical size, finish and limitations.

.3 Samples:
.1 Provide labelled samples of materials to be used on project for approval before work commences.

.4 Test and Evaluation Reports:
.1 Provide certified test reports showing compliance with specified performance characteristics and physical properties.
.2 Provide laboratory test reports certifying compliance of mortar ingredients with specifications requirements.

1.05 QUALITY ASSURANCE

.1 Masonry Contractor:
.1 Use single Masonry Contractor for masonry work.
.2 Masonry Contractor to have experience in historic stone and brick masonry repair and conservation work on projects of similar size and complexity to Work of this Contract.
.3 Masonry Contractor to have good level of understanding of structural behavior of masonry walls when masonry work involves replacing or repairing stones or brick which are part of structural masonry work.
.4 Masonry Contractor will be responsible for all aspects of masonry work for duration of project.

.2 Project Supervisor:
.1 Masonry Contractor to employ a Project Supervisor with documented successful experience of historic masonry repair and conservation work of required for this Contract. Project Supervisor to be present on site full-time for duration of Work.
.2 Demonstrate competence levels to satisfaction of Departmental Representative before undertaking Work.

.3 Masons:
.1 Masons to have certificate of qualification with experience in historic stone and brick masonry repair and conservation work required for this Contract.
.2 Masons to have proof of license certification for proprietary restoration mortars.

.4 Grouting: grouting activities should be undertaken by workers experienced in manipulation and grouting methods.

.5 Departmental Representative reserves the right to reject Masonry Contractor or proposed Project Supervisor, mason or apprentice if, documentation provided does not demonstrate level of experience or skill required for successful completion of Work of this Contract.

.6 Obtain approval from Departmental Representative for changes to qualified personnel.

.7 Mock-ups:
.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
.2 Construct mock-up 1m x 1m to demonstrate raking and repointing

procedures for each type of above grade exterior masonry material specified in locations designated by Departmental Representative.

.3 Notify Departmental Representative 3 business days prior to construction of the mock-up.

.4 Perform mock-up of masonry cleaning with low pressure clean water and soft natural bristle brush.

.5 Construct mock-up to demonstrate a full understanding of specified procedures, techniques and formulations is achieved before work commences.

.6 Construct mock-up where directed by Departmental Representative.

.7 Work not to proceed prior to approval of mock-up. Allow 72 hours for inspection of mock-up by Departmental Representative before proceeding with masonry repointing work.

.8 Repeat mock-up until results obtained are to satisfaction of Departmental Representative.

.9 Mock-up will be used to:

.1 Judge quality of work, substrate preparation, operation of equipment, material preparation and application, and curing methods.

.2 Determine joint finish required.

.3 Test to determine compliance with property requirements.

.10 Accepted mock-up will demonstrate minimum standard for this work. Mock-up will remain as part of finished work.

.8 Laboratory tests for mortar:

.1 Contractor to include costs for provision of laboratory testing of pointing mortars during mock-ups and on a continuing weekly basis.

.2 Test following properties, at a minimum, will be tested:

.1 Compressive strength: 7 day and 28 day.

.2 Air entrainment percentage.

.3 Sample mortar for testing purposes directly on site.

1.06 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

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

.2 Store cementitious materials and aggregates in accordance with CSA A23.1/A23.2.

.3 Store lime putty in plastic lined sealed drums.

.4 Keep material dry. Protect from weather, freezing and contamination.

.5 Remove rejected or contaminated material from site.

.6 Replace defective or damaged materials with new.

1.07 SITE CONDITIONS

.1 Ambient conditions:

.1 Maintain masonry temperature between 10 and 27 degrees C for duration of work.
.2 When ambient temperature is below 10 degrees C or is forecast to fall below 5 degrees C within 24 hours:
.1 Maintain temperature of lime at or above 10 degrees C at all times.
.2 Store mortar materials for immediate use within heated enclosure. Allow mortar materials to reach minimum temperature of 10 degrees C before use.
.3 Provide enclosure system around curing area to ensure that stated conditions are maintained for curing period.
.4 Use heated temporary enclosures to maintain temperatures above 5 degrees C in cold weather only with written approval of material manufacturer and Departmental Representative.
.5 Submit enclosure system for approval from Departmental Representative.

.2 Remove work exposed to temperatures lower than 5 degrees C as directed by Departmental Representative.

.3 When ambient temperature is above 21 degrees C:
.1 Protect repointed areas from direct sunlight and wind.
.2 Use protective methods acceptable to the Departmental Representative.

.4 Provide humid cure for a minimum of 7 days.

.5 Use and prepare mortar when the ambient air temperature is between 10 and 27 degrees C at the location of the work.

.6 Maintain sand and aggregate temperature between 10- and 30-degrees C.

.7 Maintain mortar mix temperature between 10- and 30-degrees C.

2 PRODUCTS

2.01 MORTAR

.1 Mortar: in accordance with CAN/CSA-A179 and Section 04 03 05.13 - Period Masonry Mortaring.

.2 Proportion Specification: In accordance with CAN/CSA-A179 and Section 04 03 05.13 - Period Masonry Mortaring.

.3 Property Specification: In accordance with CAN/CSA-A179 and Section 04 03 05.13 - Period Masonry Mortaring.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify masonry, staging and storage areas and notify Departmental Representative in writing of conditions detrimental to acceptable and timely completion of Work.
.1 Inform in writing Departmental Representative areas of

deteriorated masonry not previously identified.

.2 Notify Departmental Representative immediately if evidence of hazardous materials is discovered in work area.

.3 Stop work in that area and report to Departmental Representative immediately evidence of hazardous materials.

3.02 PROTECTION OF IN-PLACE CONDITIONS

.1 Protection requirements are specified in Section 04 03 05.13 – Period Masonry Mortaring.

3.03 SPECIAL TECHNIQUES

.1 Examine mortar joints.
.2 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as aspects of quality of work which establish authenticity of original work.
.3 Replicate the style selected by Departmental Representative.

.2 Test mortar joints.
.1 Procedure of testing: examine joints visually for signs of deteriorated masonry such as voids, spalled surfaces, loose or missing mortar and cracking or micro-cracking at edges of joints or across joints.
.2 Test joints not visually deteriorated as follows:
.1 Test for voids and weakness by using hammers or other approved means.
.2 Perform examination and testing in co-operation with Departmental Representative so that unsound joints can be marked and recorded.

3.04 RAKING JOINTS

.1 Use manual raking tool to obtain clean masonry surfaces.
.1 Remove deteriorated and adhered mortar from masonry surfaces to sound mortar, leaving square corners and flat surface at back of cut.
.2 Clean out voids and cavities encountered.

.2 Remove mortar without chipping, altering or damaging masonry units.

.3 Where use of power tools to remove mortar is deemed appropriate by Departmental Representative:
.1 Rake out using maximum 86 mm diameter blades to centre of joint only, to a maximum depth that is equal to half of joint width. Mortar must remain on each side of saw cut. Raking must not touch masonry units.
.2 Stop saw cut 50 to 75 mm from end of vertical and discontinuous horizontal joints. Do not cut into masonry units.
.3 Remove remaining mortar with hand tools.

.4 Clean surfaces of joints with non-ferrous brush without damaging texture of exposed joints or masonry units.

.5 Flush open joints and voids; clean open joints and voids with low

pressure water and if not free draining blow clean with compressed air.

.6 Leave no standing water.

.7 Replace stone or brick damaged as a result of careless raking of saw cutting, at no cost to Owner.

.8 Remove mortar from top, bottom and side joints, with back surface of joint square and of an even depth.

3.05 REPOINTING

.1 When required repair and replacement work is complete carry out repointing.

.2 Before repointing, wash down wall to be repointed and allow to dry to damp, but not wet. Ensure that dust and debris are removed from joints and wall surfaces prior to repointing.

.3 Keep masonry damp while pointing is being performed.

.4 Completely fill joint with mortar.
- .1 If surface of masonry units has worn rounded edges keep pointing back 1 mm from surface to maintain same width of joint
- .2 Avoid feathered edges.
- .3 Pack mortar firmly into voids and joints, ensuring full contact with back and sides of joint and leaving no voids.

.5 Build-up pointing in layers not exceeding 12mm in depth.
- .1 Allow each layer to set before applying subsequent layers.
- .2 Maintain joint width.

.6 Tool joints to match existing profile.
- .1 Tool, compact and finish using jointing tool to force mortar into joint.
- .2 Provide final exposed aggregate texture when mortar has dried to thumb-print hardness.

.7 Remove excess mortar from masonry face before it sets.

3.06 PROTECTION DURING CURING PROCESS

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.
- .1 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.

.2 Cover with waterproof tarps to protect newly laid mortar from frost, rainfall and rapid drying conditions such as wind.
- .1 Maintain tarps in place for minimum of 2 weeks after repointing.
- .2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.3 Anchor coverings securely in position.

.4 Damp cure:
- .1 Provide damp cure for back pointing and finish pointing mortars, at a minimum temperature of 10 degrees C.

.2 Install and maintain wetted burlap protection during the curing process, using heavy and tight-woven burlap:
.1 Minimum 3 days.
.3 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.
.4 Ensure burlap is not in contact with masonry. Leave air space of minimum 50 mm between burlap and masonry.
.5 Shade areas of work from direct sunlight and maintain constant dampness of burlap.
.6 Provide for off-hours and week-end work as required to maintain specified curing conditions.

.5 Protect from drying winds. Pay particular attention at corners of structure.

.6 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:
.1 Minimum 7 days in summer.
.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

3.07 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Clean surfaces thoroughly of mortar droppings, stains and other blemishes resulting from work of this contract on a daily basis, as work progresses.

.3 Remove droppings and splashings using clean water and thick cotton rags.

.4 Clean masonry with stiff natural bristle brushes and plain water only if mortar has fully cured.

.5 Clean masonry with low pressure clean water and soft natural bristle brush.

.6 Obtain approval of Departmental Representative prior to using other cleaning methods for persistent stains.

.7 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

3.08 PROTECTION OF COMPLETED WORK

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

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 52 00 - Construction Facilities.

.4 Section 01 56 00 - Temporary Barriers and Enclosures.

.5 Section 01 61 00 - Common Product Requirements.

.6 Section 01 74 00 - Cleaning.

.7 Section 01 74 19 - Waste Management and Disposal.

.8 Section 01 78 00 - Closeout Submittals.

.9 Section 04 03 05.13 - Period Masonry Mortaring.

.10 Section 04 03 05.21 - Period Masonry Repointing.

.11 Section 07 92 00 - Joint Sealants.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 ASTM International (ASTM)
- .1 ASTM C 97/C 97M-[15], Standard Test Methods for Absorption and Bulk Specific Gravity of Dimension Stone.
- .2 ASTM C 170/C 170M-[16], Standard Test Method for Compressive Strength of Dimension Stone.
- .3 ASTM C 503/C 503M-[15], Standard Specification for Marble Dimension Stone.
- .4 ASTM C 568/C 568M-[15], Standard Specification for Limestone Dimension Stone.
- .5 ASTM C 615/C 615M-[11], Standard Specification for Granite Dimension Stone.
- .6 ASTM C 616/C 616M-[15], Standard Specification for Quartz-Based Dimension Stone.

.3 CSA Group (CSA)
- .1 CAN/CSA-A179-[14], Mortar and Grout for Unit Masonry.
- .2 CSA A370-[14], Connectors for Masonry.
- .3 CAN/CSA-A371-[14], Masonry Construction for Buildings.

.4 South Coast Air Quality Management District (SCAQMD)
- .1 SCAQMD Rule 1168-[A2011], Adhesive and Sealant Applications.

1.03 DEFINITIONS

.1 Lewis: instrument inserted at top of stone as means of attachment in

raising and lowering. Holds stone by means of keys or wedges fitted to dovetailed recess.

.2 Dogs: metal appliance for securing parts or members together by means of one or more projecting teeth or bent portions, lug, cramp.

.3 Fabricator: company having sufficient capacity to quarry, cut, and deliver stonework on schedule.

.4 Installer: company or person specializing in commercial stone work [with 10 years [documented] experience]. Employ skilled stone masons on site to do necessary field cutting as stones are set.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for [masonry materials and reinforcing] and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
- .1 Submit drawings describing method of stone replacement, including removal, shoring and erection.

.4 Samples:
- .1 Submit samples of replacement stones not less than 10 days before masonry work begins.
  - .1 Submit 2 of each type of masonry unit specified: Field stone foundation units.
  - .2 Submit 1 of each type of masonry accessory specified.
  - .3 Submit 1 of each type of masonry reinforcement and tie proposed for use.
  - .4 Submit as required for testing purposes.
- .2 Provide mortar samples in quantity and size specified in CAN/CSA-A179.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for [masonry work] for incorporation into manual.

1.06 QUALITY ASSURANCE

.1 Qualifications:
- .1 Execute work by personnel experienced in preservation of historic masonry.
- .2 Masons engaged by Masonry Contractor to have experience with historic masonry.
- .3 Departmental Representative has right to reject masons who do not demonstrate appropriate abilities or experience. Refer to Section 01 61 00 - Common Product Requirements.

.4 Masons employed on this project throughout course of project must meet above requirements. Where, during course of project, masons leave work force, replacement masons must also meet requirements.

.2 Mock-ups:
.1 Construct mock-up in accordance with Section 01 45 00 - Quality Control.
.2 Construct mock-up 1m² minimum of stonework to be refaced with specified materials and methods.
.3 Do not use existing stonework when constructing job mock-up.
.4 Construct mock-up where directed by Departmental Representative.
.5 Notify Departmental Representative minimum of 24 hours prior to construction of mock-up.
.6 Work not to proceed prior to approval of mock-up. Allow 72 hours for inspection of mock-up by Departmental Representative before proceeding with stone repair work.
.7 Perform mock-up of masonry cleaning with low pressure clean water and soft natural bristle brush.
.8 When accepted, mock-up will demonstrate minimum standard for this work.
.9 Remove mock-up at completion of work as directed by Departmental Representative.

1.07 DELIVERY, STORAGE AND HANDLING

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

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

.3 Prevent damage and soiling of finishes when transporting, storing and handling.

.4 Keep materials dry. Protect against weather, freezing and any source of contamination.

.5 Do not place stones directly on the ground.

1.08 SITE CONDITIONS

.1 Ambient conditions:
.2 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:
.1 Minimum 7 days in summer.
.2 Minimum 30 days in cold weather conditions using dry heated enclosures.

2 PRODUCTS

2.01 MATERIALS

.1 Obtain new stone from a single quarry source acceptable to Departmental Representative.
.1 Ensure single quarry source has resources to provide materials of

consistent quality and matching existing stone.
.2 Procurement of stones to meet approved schedule.

.2 Field stone: locally sourced field stone, like the stone in the existing foundation, of full colour range with maximum single stone face of 0.2 m² and predominance of stones measuring not less than 300mm across.

.3 Stones:
.1 Good quality, free of cracks, quarrying marks, pick marks and other defects impairing structural integrity of material.
.2 Stone: quarry without blasting.

2.02 STONE CHARACTERISTICS

.1 Field Stone:
.1 Stratification: low, bedding plane to within 15% of the horizontal trim of work.
.2 Compressive strength: 101.8 MPa.

2.03 STONE BEDDING PLANES

.1 Naturally-bedded: foundation stones.

2.04 STONE FABRICATION

.1 Cut stone to shape and dimensions and full to square with joints as indicated.
.1 Dress exposed faces true.

.2 Cut-in reglets for flashings where indicated.

.3 Back-check stone contacting structural members as indicated.
.1 Allow minimum of 25 mm clearance between back of stone and structural members.
.2 Shape beds of stone resting on structural work to fit supports.

.4 Cut stones for anchors, cramps, dowels and support systems.
.1 Provide Lewis pin and clamp holes in pieces which can not be manually lifted.
.2 Do not cut holes in exposed surfaces.

.5 Finish exposed faces and edges of stones to comply with requirements indicated for finish and match existing construction and mock-ups.

.6 Roughen stone surfaces of new cut stone against which mortar is to be placed if face is smooth as a result of sawing by scoring with saw grinder.
.1 Space score lines maximum 25mm on center and minimum 3mm in depth.

2.05 EXISTING STONE

.1 Use hard, sound, and clean existing stone salvaged on site only with Departmental Representative's approval.

2.06 MORTAR

.1 Mortar: in accordance with Section 04 03 05.13 - Period Masonry Mortaring.

.2 Obtain mortar ingredients of uniform quality and from a single manufacturer, source or producer.

.3 Proportion Requirements:
.1 In accordance with CAN/CSA-A179 Section 04 03 05.13 - Period Masonry Mortaring.

.4 Property Requirements:
.1 In accordance with CAN/CSA-A179 Section 04 03 05.13 - Period Masonry Mortaring.

2.07 FLASHING

.1 Flexible Flashing: air/vapour barrier sheet membrane, as specified under Section 07 62 00 Sheet Metal Flashing and Trim.

.2 Flexible Flashing: sheet polyethylene 0.25mm thick.

.3 Sheet Metal: stainless steel.

2.08 ACCESSORIES

.1 Obtain each type of stone necessary, sealant and other materials from a single manufacturer.

.2 Anchors, cramps, dowels: stainless steel type 304.

.3 Sealant and backer rod: non-staining type, in accordance with Section 07 92 00 - Joint Sealants.
.1 Sealant: maximum VOC limit 100 g/L.

.4 Setting Buttons: lead type; non-staining; sized to suit joint thicknesses and bed depths without intruding into required depths of joint sealants or causing third-side adhesion between sealant and setting button.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify masonry, staging and storage areas and notify Departmental Representative of conditions detrimental to acceptable and timely completion of Work.
.1 Inform Departmental Representative areas of deteriorated masonry not previously identified.
.2 Obtain Departmental Representative's approval and instructions for repair and replacement of masonry units before proceeding with repair work.
.3 Stop work immediately and report to Departmental Representative evidence of hazardous materials.

3.02 PREPARATION

.1 Weather (seasoned or aged) stone for six months or time specified by Departmental Representative. Prevent absorption of ground water and water accumulation on stone. Rest stones in their natural bedding during weathering.

.2 Move and lift stone units using means to prevent damage. Do not make holes or indentations for Lewises or dogs on face or top side of stone.

.3 Indicate bedding planes of stone units. Duplicate bedding marks on usable pieces of cut stone.

.4 Place safety devices and signs near work area as directed in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.5 Install and remove self-supporting scaffolding in accordance with Section 01 52 00 - Construction Facilities.

.6 Protection of in-place conditions:
  .1 Protect adjacent plant material and fragile surfaces.

3.03 RESETTING

.1 Fix dislodged masonry units in correct location with firm mortar.

.2 Insert and compress firm mortar to within 50mm of pointing surface. Allow mortar to set 24 hours. Damp cure required for minimum 3 days before pointing.

.3 Point to surface in two layers.

3.04 STONE REMOVAL

.1 Remove loose material and deteriorated stones. Create level surface 50 mm from masonry face for setting of stone face plates.

.2 Clean dust, mortar and stone fragments from slot.

3.05 RAKING JOINTS

.1 Use manual raking tool to obtain clean masonry surfaces.
  .1 Remove deteriorated and adhered mortar from masonry surfaces to sound mortar leaving square corners and flat surface at back of cut.
  .2 Clean out voids and cavities encountered

.2 Remove mortar without chipping, altering or damaging masonry units.

.3 Clean with non-ferrous brush surfaces of joints without damaging texture of exposed joints or masonry units.

.4 Flush open joints and voids; clean open joints and voids with low pressure water and if not free draining blow clean with compressed air.

.5 Leave no standing water.

.6 Where use of power tools to remove mortar is deemed appropriate by the

Departmental Representative:

.1 Rake out using maximum 86mm diameter blades to the centre of the joint only, to a maximum depth that is equal to half of the joint width. Mortar must remain on each side of the saw cut. Raking must not touch the masonry units.

.2 Stop saw cut 50 to 75 mm from end of vertical and discontinuous horizontal joints. Do not cut into masonry units.

.3 Notify the Departmental Representative to inspect the raking, prior to removing the remaining mortar with hand tools.

.4 Remove remaining mortar with hand tools.

3.06 CUTTING/SIZING OF STONE

.1 Use calipers, squares and levels to measure hole for new stone. Allow for mortar joints to match existing.

.2 Sill stones:

.1 Provide 1:10 slope on top face of stone unit, sloping down to front face.

.3 Coping stones

.1 Provide 1:10 slope on top face of stone unit, sloping down to front face.

3.07 MOVING STONES

.1 Use Lewises to lift stones to working level.

.2 Move stones horizontally in wheelbarrows.

.3 Slide stones into place on wood ramps.

.4 Protect edges of stone from damage when hoisting and lifting from position. Use separators or wood shims to isolate units from hoisting belts.

.1 Incorporate only undamaged stone in Work.

3.08 STONE REPLACEMENT

.1 Co-ordinate bond pattern, coursing height and joint width with existing stonework in area selected by Departmental Representative.

.2 Clean dust and stone fragments from slot.

.3 Clean stone by washing with water and natural fibre brush before laying.

.4 Before proceeding with Work, inspect cleaned surface.

.5 Install masonry ties, connectors and flashings in accordance with CSA A370 and CAN/CSA-A371 unless indicated otherwise.

.1 Apply asphalt emulsion to masonry ties and masonry connectors.

.2 Obtain approval of Departmental Representative of placement of ties and connectors prior to placing mortar.

.3 Use non-corrosive ties and connectors.

.6 Install anchors, dowels and cramps.

.1 Obtain approval of Departmental Representative of placement of

anchors, dowels and cramps prior to placing mortar.

.2 Use non-corrosive anchors, dowels and cramps to fix stone face plates.

.7 Dampen slot's surfaces before applying mortar.

.8 Apply bedding mortar.

.1 Lay stones on full beds of mortar.

.2 Lay heavy stones and projecting stones after mortar in courses below has hardened sufficiently to support weight.

.3 Prop and anchor projecting stones until wall above is set.

.4 Set large stones on water soaked softwood wedges to support stone in proper alignment until mortar has set. Remove wedges when dry, do not break off.

.5 Set stones to match alignment of adjacent stones in full bed of mortar with vertical joints buttered and placed full except where otherwise specified.

.6 Fill anchor completely, dowel and lifting holes and voids left by removed edges.

.9 Fill vertical joints buttered and placed full in face, and at vertical joint between wythes.

.10 Tool joints with a round jointer to provide smooth joints compressed uniformly concave.

.11 Rake bedding mortar back to a minimum depth of 25 mm and make ready for pointing with pointing mortar in separate operation.

.1 Provide minimum 3-day damp cure to bedding mortar prior to pointing.

.2 Remove mortar dropping from face of stone before mortar is set. Sponge stone free of mortar along joints as work progresses.

3.09 FILLING JOINTS/POINTING

.1 Fill joints and point: in accordance with Section 04 03 05.21 - Period Masonry Repointing.

.2 Joint preparation:

.1 Rake out joints to a depth 4x the joint width before bedding mortar sets.

.2 Leave stone surfaces clean.

.3 Ensure back of joint is vertical, sound, uniform and ready for pointing.

3.10 REPOINTING

.1 Do pointing work in accordance with Section 04 03 05.21 - Period Masonry Repointing.

.2 Dampen joints and porous masonry units.

.3 Keep masonry damp during performance of pointing.

.4 Maintain masonry temperature between 5 and 25 degrees C for duration of the Work.

.5 Completely fill joint with mortar.

.1 Masonry units with worn rounded edges: maintain joint width by pointing back from exterior face.
.2 Avoid feather edges.
.3 Pack mortar solidly into voids and joints.
.4 Build-up pointing in layers not exceeding 12mm in depth.
.1 Allow each layer to set before applying subsequent layers.
.2 Maintain joint width.

.6 Tool and finish joints to match existing profile.

.7 Remove excess mortar from masonry face before it sets.

3.11 PROTECTION OF WORK

.1 Cover completed and partially completed work not enclosed or sheltered at end of each work day.
.1 Extend membranes 0.5 m beyond surface area of work.
.1 Prevent finished work from drying out too rapidly.

.2 Cover with waterproof tarps to prevent weather from eroding recently repointed material.
.1 Maintain tarps in place for minimum of 2 weeks after repointing.
.2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.3 Anchor coverings securely in position.

.4 Damp cure:
.1 Provide damp cure for pointing mortars.
.1 Install and maintain wetted burlap protection during the curing process:
.1 Minimum 3 days.
.2 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.
.3 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.5 Protect from drying winds. Pay particular attention at corners.

.6 Cover with waterproof tarps to prevent weather from eroding recently laid material.
.1 Maintain tarps in place for minimum of 1 week after laying.
.2 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.7 Inspect tarps for duration of curing.

3.12 CLEANING

.1 Confirm acceptance of mock-up cleaning operations to demonstration from Departmental Representative before starting cleaning work.

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

.3 Clean stone surfaces of adhesive or mortar residue resulting from work performed without damaging stone or joints.

.4 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
.1 Leave Work area clean at end of each day.

.5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

.6 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.7 Protect plants, grass, vegetation and soil from accumulation of water used for cleaning.

3.13 STONE SCHEDULE

.1 Item: Field Stone.
.1 Location: foundation.
.2 Type of Stone: locally sourced (river bank) to match existing foundation.
.3 Finish: natural.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 04 03 05.13 - Period Masonry Mortaring.

.5 Section 04 03 05.16 - Period Masonry Grouting.

.6 Section 04 03 05.21 - Period Masonry Repointing.

1.02 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM C 73-[10], Standard Specification for Calcium Silicate Brick (Sand-Lime Brick).
- .2 ASTM C216-[13], Standard Specification for, Facing Brick (Solid Masonry Units Made of Clay or Shale).

.2 Brick Industry Association (BIA)
- .1 Technical Note No. 20-[2006], Cleaning Brick Work.

.3 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.4 CSA Group
- .1 CAN/CSA-A82-[06(R2011)], Fired Masonry Brick Made From Clay or Shale.
- .2 CAN/CSA-A165 Series-[04(R2009)], CSA Standards on Concrete Masonry Units (Consists of A165.1, A165.2 and A165.3).
- .3 CAN/CSA-A371-[04(R2009), Masonry Construction for Buildings.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for [brick masonry] and include product characteristics, performance criteria, physical size, finish and limitations.

1.04 QUALITY ASSURANCE

.1 Test Reports: submit certified test reports including sand gradation tests in accordance with CAN/CSA-A179 showing compliance with specified performance characteristics and physical properties.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.3 Mock-ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
.1 Construct mock-up panel of exterior brick replacement 1200 x 1800mm.

1.05 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect brick masonry from nicks, scratches, and blemishes.
.3 Replace defective or damaged materials with new.

1.06 SITE CONDITIONS

.1 Ambient Conditions: assemble and erect components only when temperature is above 5 degrees C.

2 PRODUCTS

2.01 MANUFACTURED UNITS

.1 Face brick:
.2 Fired clay brick: to CAN/CSA-A82.
.1 Type: to match immediately surrounding bricks.
.2 Grade: EG.
.3 Size: to match immediately surrounding bricks.
.4 Colour and texture: to match immediately surrounding bricks.
.5 Solid/hollow.

.2 Back-up brick:
.1 Burned clay brick: to CAN/CSA-A82.
.1 Type: same as face brick.
.2 Grade: EG same as face brick.
.3 Size: same as face brick.
.4 Solid/hollow.

.3 Mortar Mixes:
.1 Mortar and mortar mixes in accordance with Section 04 03 05.13 - Period Masonry Mortaring.

.4 Grout Mixes:
.1 Grout and grout mixes in accordance with Section 04 03 05.16 - Period Masonry Grouting.

.5 Cleaning Compounds:
.1 Use low VOC products in compliance with SCAQMD Rule 1168.
.2 Compatible with substrate and acceptable to masonry manufacturer for use on products.
.3 Cleaning compounds compatible with brick masonry units and in accordance with manufacturer's written recommendations and instructions.

3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

.1 Protect adjacent finished materials from damage due to masonry work.

3.03 INSTALLATION

.1 Construction to conform to CAN/CSA-A371.

.2 Bond: stretcher.

.3 Coursing height: to match immediately surrounding masonry.

.4 Jointing: to match immediately surrounding masonry.
.1 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.
.2 Clean unglazed clay masonry as work progresses.
.3 Mortar Placement:
.1 Place mortar in accordance with Section 04 03 05.13 - Period Masonry Mortaring.
.4 Grout Placement:
.1 Place grout in accordance with Section 04 03 05.16 - Period Masonry Grouting.
.5 Repair/Restoration:
.1 Upon completion of masonry, fill holes and cracks, remove loose mortar and repair defective work.
.6 Tolerances:
.1 To CAN/CSA-A371.

3.04 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.3 Clean unglazed clay masonry:
- .1 Remove large particles with wood paddles without damaging surface. Saturate masonry with clean water and flush off loose mortar and dirt.
- .2 Scrub with solution of 25 ml trisodium phosphate and 25 ml household detergent dissolved in 1 L of clean water using stiff fibre brushes, then clean off immediately with clean water using hose. Alternatively, use proprietary compound recommended by brick masonry manufacturer in accordance with manufacturer's directions.
- .3 Repeat cleaning process as often as necessary to remove mortar and other stains.
- .4 Use acid solution treatment for difficult to clean masonry as described in Technical Note No.20 by the Brick Industry Association.

.4 Clean concrete brick masonry as work progresses.
- .1 Allow mortar droppings on masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of brick and finally by brushing.

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

.6 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.05 PROTECTION

.1 Protect brick masonry in accordance with Section 04 03 05.21 - Period Masonry Repointing.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 61 00 Common Product Requirements.

.3 Section 01 74 19 - Waste Management and Disposal.

.4 Section 06 08 99 Rough Carpentry for Minor Works.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 ASTM International (ASTM)
- .1 ASTM A 123-[15] Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .2 ASTM A 153/A 153M-[09] Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- .3 ASTM A 480/A 480M-[15] Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
- .4 ASTM A 653/A 653M-[15] Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .5 ASTM F 2329/F 2329M-[15] Standard Specification for Zinc Coating, Hot-Dip, Requirements for Application to Carbon and Alloy Steel Bolts, Screws, Washers, Nuts, and Special Threaded Fasteners

.3 American Wood-Preservers' Association (AWPA)
- .1 AWPA M2-[15], Standard for Inspection of Treated Wood Products.
- .2 AWPA M4-[15], Standard for the Care of Preservative-Treated Wood Products.

.4 CSA Group
- .1 CSA O80 Series-[2015], Wood Preservation.
- .2 CSA O322-[15], Procedure for Certification of Pressure-Treated Wood Materials for Use in Preserved Wood Foundations.

.5 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)
- .1 SCAQMD Rule 1113-[2013], Architectural Coatings.

.6 Underwriters Laboratory of Canada (ULC)
- .1 CAN/ULC-S102 Surface Burning Characteristics of Building Materials and Assemblies.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Quality assurance submittals:

.1 Submit certificates in accordance with Section 01 33 00 - Submittal Procedures.
.2 For products treated with preservative and/or fire-retardant by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
  .1 Information listed in AWPA M2 and revisions specified in CSA O80 Series, Supplementary Requirement to AWPA M2 applicable to specified treatment.
  .2 Moisture content after drying following treatment with water-borne preservative and/or fire-retardant.
  .3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.
.3 Recommended metal connector and fastener materials and corrosion protection.
.4 Product recommendation for field treatment.

1.04 QUALITY ASSURANCE

.1 Plant inspection of products treated with preservative and fire-retardant by pressure impregnation will have been carried out by designated testing laboratory to AWPA M2, and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Each piece of lumber and plywood for preserved wood foundations to be identified by CSA O322 certified stamp.

.3 Regulatory Requirements:
  .1 Each board or bundle of fire-retardant treated material to bear ULC label indicating Flame Spread Classification (FSC), and smoke developed.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 Common Product Requirements, Section 06 08 99 Rough Carpentry for Minor Works, with AWPA M4 and with manufacturer's written instructions.

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

.3 Waste Management and Disposal:
  .1 Separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
  .2 Store separated reusable treated wood waste convenient to cutting station and work areas.

2 PRODUCTS

2.01 SUSTAINABLE REQUIREMENTS

.1 Preservatives: maximum VOC limit [350] g/L in accordance with SCAQMD Rule #1113, Architectural Coatings.

.2 Wood preservation plants: certified by Canadian Wood Preservation

Authority (CWPCA) to Environment Canada Technical Recommendation Document for the Design and Operation of Wood Preservation Facilities.

2.02 PRESERVATIVE TREATED WOOD MATERIALS AND APPLICATION

.1 Provide preservative treated lumber and plywood in accordance with CSA O80 Series standards as specified below.

.2 Lumber Battens in rainscreen cavities:
- .1 Use Category: 3.2
- .2 Clause: 9.7

.3 Plywood Battens in rainscreen cavities:
- .1 Use Category: 3.2
- .2 Clause: 9.7 and 9.2.2.5.

.4 Sawn Lumber Battens in rainscreen cavities:
- .1 Use Category: 3.2
- .2 Clause: 9.7

.5 Cant strips above ground:
- .1 Use Category: 3.2
- .2 Clause: 9.2

.6 Decking, above ground, exterior:
- .1 Use Category: 3.2
- .2 Clause: 9.2 and 9.2.2.5

.7 Deck joists and support posts in ground contact:
- .1 Use Category: 4.1
- .2 Clause: 9.2 and 9.2.2.5

.8 Furring strips, above ground, exterior, between cladding and weather barrier:
- .1 Use Category: 3.2
- .2 Clause: 9.2 and 9.2.2.5

.9 Building construction, interior, damp:
- .1 Use Category: 2
- .2 Clause: 9.

.10 Permanent wood foundation:
- .1 Use Category: 4.2
- .2 Clause: 9.2 and 9.2.2.1.

.11 Preservative treatment finish: chemical pressure treated.
- .1 Match finish of new ramp and guard rail to existing adjacent deck remaining.

2.03 FIRE-RETARDANT TREATED MATERIALS AND APPLICATION

.1 Provide fire retardant treated lumber for interior use conforming to CSA O80 Series standards use category F1 and clause 9.9, to provide the following characteristics when tested in accordance with CAN/ULC-S102:
- .1 Flame Spread Classification: FSC 25.
- .2 Smoke developed of not more than: 200.

.2 Provide fire retardant treated interior plywood conforming to CSA O80

Series standards use category F1 and clause 9.9, to provide the following characteristics when tested in accordance with CAN/ULC-S102:
.1 Flame Spread Classification: FSC 25.
.2 Smoke developed of not more than: 200.

.3 Kiln dry fire retardant treated products after treatment to the following moisture contents:
.1 Plywood: 15%.
.2 Lumber: 19%.

2.04 CORROSION PROTECTION FOR CONNECTORS AND FASTENERS FOR USE WITH TREATED WOOD

.1 Connectors: Fabricated from Type 304/316 stainless steel sheet to ASTM A 480.

.2 Fasteners: Hot dip galvanized to Type 304/316 stainless steel to ASTM A 480.

2.05 PRESERVATIVE FOR FIELD TREATMENT

.1 Type recommended by manufacturer to suit specified pressure treated products.

3 EXECUTION

3.01 CONSTRUCTION

.1 Use connectors and fasteners with specified corrosion protection in all construction with treated wood products.

3.02 FIELD TREATMENT

.1 Comply with AWPA M4 and revisions specified in CSA O80 Series, Supplementary Requirements to AWPA M2.

.2 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of recommended preservative before installation.

.3 Remove chemical deposits from surfaces of treated wood to receive applied finish.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 61 00 - Common Product Requirements

.3 Section 01 74 11 - Cleaning.

.4 Section 01 74 19 - Waste Management and Disposal.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 CSA Group (CSA)
- .1 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
- .2 CSA O121-[08], Douglas Fir Plywood.
- .3 CSA O141-[05(R2009)], Softwood Lumber.
- .4 CSA O151-[09], Canadian Softwood Plywood.
- .5 CAN/CSA-O325.0-[07], Construction Sheathing.
- .6 CAN/CSA-Z809-[08], Sustainable Forest Management.

.3 National Research Council Canada (NRC)
- .1 National Building Code of Canada [2015] (NBC).

.4 Forest Stewardship Council (FSC)
- .1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.

.5 Green Seal Environmental Standards (GS)
- .1 GS-11-[11], Paints and Coatings.

.6 National Lumber Grades Authority (NLGA)
- .1 Standard Grading Rules for Canadian Lumber [2010].

.7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
- .1 SCAQMD Rule 1113-[A2011], Architectural Coatings.

.8 Sustainable Forestry Initiative (SFI)
- .1 SFI-[2010-2014] Standard.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for rough carpentry work and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Low-Emitting Materials:
  .1 Submit listing of [paints and coatings] used in building, comply with VOC and chemical component limits or restriction requirements.
  .2 Submit listing of [composite wood products used in building, stating that they contain no added urea-formaldehyde resins,] [and] [laminate adhesives used in building, stating that they contain no urea-formaldehyde].

1.04 QUALITY ASSURANCE

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

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

.3 Plywood, OSB and wood based composite panel construction sheathing identification: by grademark in accordance with applicable CSA standards.

1.05 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
  .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  .2 Store and protect wood from nicks, scratches, and blemishes.
  .3 Replace defective or damaged materials with new.

2 PRODUCTS

2.01 MATERIALS

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
  .1 CAN/CSA-O141.
  .2 NLGA Standard Grading Rules for Canadian Lumber.
  .3 CAN/CSA-Z809 or FSC or SFI certified.

.2 Furring, blocking, nailing strips, grounds, rough bucks, cants, curbs, fascia backing and sleepers:
  .1 S2S is acceptable for all above.
  .2 Board sizes: "Standard" or better grade.
  .3 Dimension sizes: "Standard" light framing or better grade.
  .4 Post and timbers sizes: "Standard" or better grade.

.3 Panel Materials:

.1 Douglas fir plywood (DFP): to CSA O121, standard construction.
.1 Urea-formaldehyde free.
.2 Canadian softwood plywood (CSP): to CSA O151, standard construction.
.1 Urea-formaldehyde free.
.3 Plywood, OSB and wood based composite panels: to CAN/CSA-O325.
.1 Urea-formaldehyde free.

.4 Wood Preservative:
.1 Surface-applied wood preservative: clear, copper naphthenate or 5% pentachlorophenol solution, water repellent preservative.
.2 Pentachlorophenol use is restricted to building components that are in ground contact and subject to decay or insect attack only. Where used, pentachlorophenol-treated wood must be covered with two coats of an appropriate sealer.
.3 Structures built with wood treated with pentachlorophenol and inorganic arsenicals must not be used for storing food nor should the wood come in contact with drinking water.

.5 Primers and Coatings: in accordance with manufacturer's recommendations for surface conditions:
.1 Primer: VOC limit 100 g/L maximum to GS-11 SCAQMD Rule 1113.
.2 Paint: VOC limit 150 g/L maximum to GS-11 SCAQMD Rule 1113.
.3 Coating: VOC limit 275 g/L maximum to GS-11 SCAQMD Rule 1113.

2.02 ACCESSORIES

.1 Fasteners: to CAN/CSA-G164, for exterior work, pressure - preservative and fire-retardant treated lumber.

.2 Nails, spikes and staples: to CSA B111.

.3 Bolts: 12.5 mm diameter unless indicated otherwise, complete with nuts and washers.

.4 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fiber plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

3 EXECUTION

3.01 EXAMINATION

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

3.02 PREPARATION

.1 Treat surfaces of material with wood preservative, before installation.

.2 Apply preservative by dipping, or by brush to completely saturate and

maintain wet film on surface for minimum 3 minute soak on lumber and 1 minute soak on plywood.

.3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.

.4 Treat material as follows:
- .1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.
- .2 Wood furring on outside surface of exterior masonry walls.
- .3 Wood sleepers supporting wood subflooring over concrete slabs in contact with ground or fill.

3.03 INSTALLATION

.1 Comply with requirements of National Building Code of Canada (NBC), supplemented by the following paragraphs.

.2 Install furring and blocking as required to space-out and support casework, cabinets, wall and ceiling finishes, facings, fascia, soffit, siding and other work as required.

.3 Align and plumb faces of furring and blocking to tolerance of 1:600.

.4 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

.5 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized steel fasteners.

.6 Install wood backing, dressed, tapered and recessed slightly below top surface of roof insulation for roof hopper.

.7 Install sleepers as indicated.

.8 Use caution when working with particle board. Use dust collectors and high quality respirator masks.

.9 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

.10 Countersink bolts where necessary to provide clearance for other work.

3.04 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
- .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 45 00 - Quality Control.

.4 Section 01 61 00 - Common Product Requirements.

.5 Section 01 74 11 - Cleaning.

.6 Section 01 74 19 - Waste Management and Disposal.

.7 Section 06 05 73 Wood Treatment.

.8 Section 06 08 99 Rough Carpentry for Minor Works.

.9 Section 08 03 52 Conservation Treatment for Period Windows.

1.02 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI)
  .1 ANSI A208.1-[09], Particleboard.
  .2 ANSI A208.2-[09], Medium Density Fiberboard (MDF) for Interior Applications.
  .3 ANSI/HPVA HP-1-[10], American National Standard for Hardwood and Decorative Plywood.
  .4 ANSI/BHMA A156.16 Auxiliary Hardware.
  .5 ANSI/ASME 18.6.1 [1981 (R2012)] Wood Screws (Inch Series).

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  .1 Architectural Woodwork Quality Standards, [2nd] edition, [2014].

.3 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.4 ASTM International (ASTM)
  .1 ASTM A 153/A 153M-[16], Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  .2 ASTM E 1333-[14] Standard Test Method for Determining Formaldehyde Concentrations in Air and Emission Rates from Wood Products Using a Large Chamber.
  .3 ASTM F 1667-[13] Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.5 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-11.3-[M87], Hardboard.

.6 CSA Group (CSA)
  .1 CSA O121-[08(R2013)], Douglas Fir Plywood.
  .2 CSA O151-[09(R2014)], Canadian Softwood Plywood.
  .3 CSA O153-[M13], Poplar Plywood.

.4 CAN/CSA-Z809-[08(R2013)], Sustainable Forest Management.

.7 Forest Stewardship Council (FSC)
.1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.

.8 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (SDS).

.9 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

.10 Sustainable Forestry Initiative (SFI)
.1 SFI-[2015-2019] Standard.

.11 Underwriters Laboratories of Canada (ULC)
.1 CAN/ULC-S104-[10], Standard Method for Fire Tests of Door Assemblies.
.2 CAN/ULC-S105-[09], Standard Specification for Fire Door Frames.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature, data sheets and catalogue pages for specified products. Include product characteristics, performance criteria, dimensions and profiles, finish and limitations on use.
.2 Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Shop Drawings:
.1 Prepare and submit shop drawings in general accordance with AWMAC AWS manual.
.2 Indicate profiles and dimensions, assembly techniques, jointing, methods of fastening, terminations and other related details.
.3 Indicate materials, thicknesses, finishes and hardware.
.4 Include schedule or key plan.
.5 Show profiles, elevations and details at scales recommended by AWMAC AWS.
.6 Where necessary, show location and type of blocking and backing required within supporting assemblies.

.4 Samples:
.1 Submit triplicate 300 mm long representative samples of each typical item of finish carpentry.
.1 Standing and running trim: 300 mm long.
.2 Panel materials: 300 mm x 300 mm.
.2 Shop applied coating samples:
.1 For transparent finish, submit triplicate samples of each species and cut of wood to be used, finished to match project sample.
.2 For opaque finish, submit triplicate samples for each colour selection, finished to match project sample.
.3 Decorative overlaid composite panels, complete with applied edge treatment and corner treatment, minimum 300 mm x 300 mm.

.4 Samples for site applied finish:
.1 Furnish Two samples of each finish carpentry item and composite panel material to Contractor for preparation of field applied finish samples.
.5 Submit duplicate samples of each hardware item to be left exposed in final construction. Samples will not be returned for incorporation into the work.

.5 Certifications: submit certificates signed by manufacturer certifying materials comply with specified performance characteristics, physical properties and requirements of referenced standards.

.6 Test and Evaluation Reports: submit certified test reports for composite wood from approved independent testing laboratories, indicating compliance with specifications for specified performance characteristics and physical properties.

1.04 QUALITY ASSURANCE

.1 Mock-ups:
.1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
.2 Shop prepare one typical example of each specified item of exterior window frame trim, complete with shop applied finishes and install where directed by Departmental Representative.
.3 Allow 72 hours for inspection of mock-up by Departmental Representative.
.4 When accepted, mock-up will demonstrate minimum standard for Work.
.5 Do not proceed with work prior to receipt of written acceptance of mock-up by Departmental Representative.
.6 Accepted mock-up may remain as part of finished work.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with AWS recommendations and as follows.

.2 Deliver finish carpentry materials only when area of work is enclosed, plaster and concrete work is dry, area is broom clean and site environmental conditions are acceptable for installation.

.3 Storage and Handling Requirements:
.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Maintain indoor temperature and humidity within range recommended by AWS for location of the Work.
.3 Store products on site as specified for minimum 72 hours prior to installation.
.4 Store and protect finish carpentry products from moisture, nicks, scratches, and blemishes.
.5 Replace defective or damaged materials with new.

2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

.1 Wood fire rated frames and panels: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.

.2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and listed by nationally recognized agency having factory inspection services.

2.02 QUALITY GRADE

.1 Provide all materials and perform all work of this Section in accordance with AWMAC AWS Custom Grade.

.2 In case of conflict between Contract Documents and AWMAC AWS grade requirements, Contract Documents govern.

2.03 MATERIALS

.1 Softwood and hardwood lumber: Sound lumber to specified AWS grade requirements, kiln-dried to moisture content recommended for location of the Work.
  .1 Machine stress-rated lumber is acceptable for all purposes.

.2 MDF (medium density fiberboard) core: to ANSI A208.2, density 769 kg/mì, 19 mm thick unless indicated otherwise.
  .1 Use moisture resistant MR grade for countertops and splash-backs to receive plumbing fixtures.

2.04 MANUFACTURED TRIM

.1 Exterior trim per Section 08 03 52 Conservation Treatment For Period Windows.

2.05 MANUFACTURED FRAMES

.1 Not used.

2.06 MANUFACTURED STAIRS AND HANDRAILS

.1 Ramp and handrails:
  .1 Stringers: White Oak species, A grade.
  .2 Skirts: White Oak species, A grade.
  .3 Balusters: White Oak species, A grade.
  .4 Handrail: White Oak species, A grade.
  .5 Newel posts: White Oak species, A grade.

2.07 FASTENINGS

.1 Provide screws, bolts, expansion shields and other fastening devices required for satisfactory installation.

.2 Exposed fasteners to match finish of hardware.

.3 Nails and staples: to ASTM F 1677, galvanized to ASTM A 153/A 153M for exterior work.

.4 Wood screws: to ANSI/ASME 18.6.1, countersunk flush type unless indicated otherwise, in sizes to suit application, galvanized to ASTM A 153/A 153M for exterior work.

.5 Splines: wood.

.6 Panel adhesive: Type to suit application.
.1 VOC limit 200 g/L maximum to SCAQMD Rule 1168.

2.08 HARDWARE

.1 Use one manufacturer's product for all similar items.

.2 Miscellaneous Hardware: to ANSI/BHMA A156.16 as listed below, finished to match existing:
.1 Loophole window hardware: existing to be removed and reinstalled.
.2 Dormer window hardware: existing to be replaced with new.

.3 Hardware fastenings:
.1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation of hardware.
.2 Exposed fastening devices to match finish of hardware.
.3 Use fasteners compatible with material through which they pass.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for wood products installation in accordance with AWS tolerances and requirements of Contract Documents.
.1 Visually inspect substrate.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied.

3.02 PREPARATION

.1 Back prime woodwork before installation, to AWS.

3.03 INSTALLATION

.1 Install items of finish carpentry in accordance with AWMAC AWS grade specified for respective items.

.2 In case of conflict between Contract Documents and AWS grade requirements, Contract Documents govern.

.3 Install items of finish carpentry at locations shown on drawings.
.1 Position accurately, level, plumb straight.
.2 Fasten and anchor securely.

.4 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.

.5 Form joints to conceal shrinkage.

3.04 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 Butt and cope internal joints of baseboards to make snug, tight, joint. Cut right angle joints of casing and base with mitred joints.
- .2 Fit backs of baseboards and casing snugly to wall surfaces to eliminate cracks at junction of base and casing with walls.
- .3 Make joints in baseboard, where necessary using a 45 degrees scarf type joint.
- .4 Install door and window trim in single lengths without splicing.

.3 Interior and exterior frames:
- .1 Set frames with plumb sides and level heads and sills and secure.

.4 Handrails, wall rails and bumper rails.
- .1 Install handrails, wall rails and bumper rails in locations indicated.
- .2 Make joints hair line, dowelled and glued.
- .3 Install support brackets [as indicated].
- .4 Install brackets at ends and on centre minimum indicated by drawing details at intermediate spacings.
- .5 Secure using counter sunk screws plugged with matching wood plugs.

.5 Hardware:
- .1 Reinstall existing hinges and locks - location: loophole windows.
- .2 Install new slides and locks – location: dormer windows.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

3.06 TOUCHUP AND PROTECTION

.1 Fill and retouch all nicks, chips and scratches in factory finishes and substrate materials to AWS standards. Replace damaged items that cannot be repaired to AWS standards.

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

.3 Repair damage to adjacent materials caused by finish carpentry installation.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 01 74 11 - Cleaning.

.5 Section 01 74 19 - Waste Management and Disposal.

1.02 REFERENCE STANDARDS

.1 ASTM International
  .1 ASTM D 5116-[10], Standard Guide For Small-Scale Environmental Chamber Determinations of Organic Emissions From Indoor Materials/Products.

.2 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.3 Canadian General Standards Board (CGSB)
  .1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.
  .2 CAN/CGSB-51.34-[M86(R1988)], Vapour Barrier, Polyethylene Sheet for Use in Building Construction.

.4 CSA Group (CSA)
  .1 CSA A123.3-[05(R2010)], Asphalt Saturated Organic Roofing Felt.
  .2 CSA B111-[1974(R2003)], Wire Nails, Spikes and Staples.
  .3 CSA O118.1-[08], Western Red Cedar Shakes and Shingles.
  .4 CAN/CSA-Z809-[08], Sustainable Forest Management.

.5 Cedar Shake and Shingle Bureau (CSSB)
  .1 CSSB-[97], Cedar Shake and Shingle Grading Rules.
  .2 CSSB New Roof Construction Manual for Roof Application Details [2011].
  .3 CSSB Exterior and Interior Wall Manual for Sidewall Application Details [2002].

.6 Forest Stewardship Council (FSC)
  .1 FSC-STD-01-001-[2004], FSC Principle and Criteria for Forest Stewardship.

.7 National Research Council Canada (NRC)
  .1 National Building Code of Canada [2015] (NBC).

.8 Sustainable Forestry Initiative (SFI)
  .1 SFI-[2010-2014] Standard.

1.03 DEFINITIONS

.1 Shingle: tapered slice of wood sawn from block with taper in direction of grain or axial direction.

.2 Shake: split shingle of 9.5 mm thickness with or without taper occurring in direction of grain or axial direction.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for wood shingles and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Include information on preservation and restoration of shingles.

.3 Shop Drawings:
- .1 Indicate details of flashing installation.

.4 Samples:
- .1 Submit duplicate full-size shingles of finish and profile matching immediately surrounding roof.

1.05 QUALITY ASSURANCE

.1 Mock-ups:
- .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
  - .1 Construct 1000 mm x 1000 mm mock-up where directed by Departmental Representative.
  - .2 For testing to determine compliance with performance requirements.
    - .1 Perform tests as follows:
  - .3 Allow 72 hours for inspection of mock-up before proceeding with work.
  - .4 When accepted, mock-up will demonstrate minimum standard of quality required for this work.
    - .1 Approved mock-up may remain as part of finished work.

.2 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.06 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Exercise care to avoid damage during unloading and storing.
- .2 Store materials off ground in dry location] and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .3 Store and protect shingles from nicks, scratches, and blemishes.
- .4 Replace defective or damaged materials with new.

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

1.07 UNUSED MATERIALS

.1 Unused shingles remain property of Owner.

.2 Return unused shingles to Departmental Representative. Retain packaging or rewrap shingles to form complete bundles.

.3 Label packages to identify product, quantity and manufacturer/supplier.

.4 Deliver and store in location designated by Departmental Representative.

2 PRODUCTS

2.01 MATERIALS

.1 Red cedar shingles: to CSA O118.1, length and width to match existing, square pattern, No. 1 Blue Label A Grade, sawn.
.1 CAN/CSA-Z809 or FSC or SFI certified.

.2 Roofing felt: to CSA A123.3, perforated asphalt felt; No.15 unless otherwise specified.

.3 Sheathing paper: to CAN/CGSB-51.32, single ply type perforated.

.4 Polyethylene sheet: to CAN/CGSB-51.34, .25 mm thick.

.5 Nails: to CSA O118.1.

.6 Pressure preservative treatment: to CSA O118.1.

.7 Fire-retardant treatment: to CSA O118.1, Appendix G.

3 EXECUTION

3.01 EXAMINATION

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

3.02 MANUFACTURER'S INSTRUCTIONS

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

3.03 REMOVAL OF EXISTING ROOFING

.1 Remove existing roofing, flashings and underlay, and expose sheathing or shingle lath of roof.

.2 Withdraw existing shingle and flashing nails, set those which break off. Leave surfaces free from dirt and loose material.

.3 Departmental Representative to inspect roof sheathing. Take up, cut out, remove burn out portion of sheathing boards affected by fungal or insect attack as directed on site by Departmental Representative.

.4 Replace cut out portions of sheathing boards or lath with boards of equal sectional dimensions, and specified grade. Seat each end of board on rafter, with 25 mm bearing, and secure to rafter.

3.04 APPLICATION

.1 Do wood shingle work in accordance with National Building Code of Canada NBC.

.2 Install shingles over dry substrate.

.3 Space shingles from 6 to 10 mm.

.4 Stagger joints minimum of 40 mm in succeeding courses. Ensure that in any 3 courses no two joints are in alignment.

.5 Use two nails per shingle. Space nails 20 mm from edge and 40 mm above butt line of following course.

.6 Drive nails flush but do not crush shingles.

3.05 SHINGLE AND SHAKE ROOFING

.1 Eave protection:
- .1 Install 2-ply Type No.15 roofing felt system.
- .2 Underlayment:
  - .1 Install 450 mm wide strip of No.15 asphalt-saturated felt underlayment over wood shakes after applying each course.

.2 Install shingles with triple thickness of shingle at any given point.

.3 Double shingles at eaves, projecting butts 40 mm from first sheathing board. Project shingles 19 mm minimum at gable ends.

.4 Lay shingles with grain perpendicular to eaves.

.5 Saw shingles parallel to valley centre line. Do not break joints into valley.

.6 Apply strip of sheathing paper minimum 200 mm wide over hips and ridges. Use shingles of uniform width approximately 150 mm wide. Apply shingles at same weather exposure as field of roof.

.7 Install bottom step flashing interleafed between shingles at vertical junctions.

3.06 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.

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

.3 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.07 PROTECTION

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

.2 Repair damage to adjacent materials caused by wood shingles and shakes installation.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 01 74 11 - Cleaning.

.5 Section 01 74 19 - Waste Management and Disposal.

.6 Section 07 92 00 - Joint Sealants.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 The Aluminum Association Inc. (AAI)
- .1 AA Aluminum Design Manual [2015] Part VIII Guidelines for Aluminum Sheet Metal Work in Building Construction.
- .2 AAI DAF45-[2003(R2009)], Designation System for Aluminum Finishes.

.3 American Architectural Manufacturers Association (AAMA)
- .1 AAMA 611-[14] Voluntary Specifications for Anodized Architectural Aluminum.
- .2 AAMA 621-[02] Voluntary Specifications for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Substrates.
- .3 AAMA 2603-[15], Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
- .4 AAMA 2604-[13] Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- .5 AAMA 2605-[13] Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.4 American National Standards Institute (ANSI)
- .1 ANSI/SPRI/FM 4435/ES-1, Wind Design Standard for Edge Systems Used with Low Slope Roofing Systems [2011].

.5 ASTM International
- .1 ASTM A 240/A 240M-[16], Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
- .2 ASTM A 606/A 606M-[15], Standard Specification for Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.
- .3 ASTM A 653/A 653M-[15e1], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed)

by the Hot-Dip Process.
.4 ASTM A 755/A 755M-[16e1] Standard Specification for Steel Sheet, Metallic coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products.
.5 ASTM A 792/A 792M-[10(2015)], Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
.6 ASTM B 32-[08(2014)], Standard Specification for Solder Metal.
.7 ASTM B 209-[14] Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
.8 ASTM B 370-[12], Standard Specification for Copper Sheet and Strip for Building Construction.
.9 ASTM D 523-[14], Standard Test Method for Specular Gloss.
.10 ASTM D 1970/D 1970M-[15a] Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
.11 ASTM D 4587-[11] Standard Practice for Fluorescent UV-Condensation Exposures of Paint and Related Coatings.
.12 ASTM F 1667-[15] Standard Specification for Driven Fasteners: Nails, Spikes and Staples.

.6 Canadian General Standards Board (CGSB)
.1 CAN/CGSB-51.32-[M77], Sheathing, Membrane, Breather Type.

.7 Canadian Roofing Contractors Association (CRCA)
.1 Roofing Specifications Manual [2012].

.8 Canadian Sheet Steel Building Institute (CSSBI)
.1 CSSBI S8-2008 Quality and Performance Specification for Prefinished Sheet Steel Used for Building Products.
.2 CSSBI B17-2002 Barrier Series Prefinished Steel Sheet: Product Performance & Applications.
.3 CSSBI Sheet Steel Facts #12 [2003] Fastener Guide for Sheet Steel Building Products.

.9 CSA Group
.1 CSA A123.3-[05(2015)], Asphalt Saturated Organic Roofing Felt.
.2 CSA A123.22-[08(2013)] Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.

.10 FM Global
.1 Property Loss Prevention Data Sheets 1-49 Perimeter Flashing.

.11 Green Seal Environmental Standards
.1 Standard GS-11-[2015], Paints, Coatings, Stains, and Sealers.
.2 Standard GS-36-[2013], Adhesives for Commercial Use.

.12 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (SDS).

.13 Sheet Metal and Air Conditioning Contractors Association of North America (SMACNA)
.1 Architectural Sheet Metal Manual (2012)
.2 Residential Sheet Metal Guidelines (2001)

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

Procedures.

.2 Product Data:
.1 Submit manufacturer's printed product literature including product specifications and technical data sheets for sheet metal flashing fasteners and accessory materials. Include product characteristics, performance criteria, physical size, finish and limitations.
.2 Submit two copies WHMIS SDS - Material Safety Data Sheets in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Shop Drawings:
.1 Submit shop drawings for all sheet metal fabrications.
.2 Indicate sheet thickness, flashing dimensions and fastenings. Include anchorage, expansion joints and other provisions for thermal movement.
.3 Submit manufacturer's catalogue cut sheets for manufactured items.

.4 Samples:
.1 Submit duplicate 50 x 50mm samples of each type of sheet metal material, finishes and colour.

1.04 PRE-INSTALLATION MEETING

.1 Include sheet metal flashing and trim on agenda of pre-installation meetings of affected sections.

1.05 MOCK-UPS

.1 Include flashings in mock-ups as specified for work of other affected sections.

1.06 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

.2 Handle and store flashing materials to prevent creasing, buckling, scratching, or other damage.

.3 Waste Management and Disposal:
.1 Separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.

2 PRODUCTS

2.01 BASE SHEET METAL MATERIALS

.1 Provide sheet metal in base metal thickness specified. Where no thickness specified, provide base sheet metal in thickness recommended in Architectural Sheet Metal Manual for type of item being fabricated, but not less than the thickness required by the authority having jurisdiction.
.1

.2 Copper sheet: to ASTM B 370 temper designation alloy C11000 light cold-rolled copper.

2.02 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Pourable sealer: proprietary two-part polyurethane pourable sealer designed for sealing penetration pockets.
.1 Maximum VOC limit 50 g/L to SCAQMD Rule 1168.

.3 Loose laid underlay for metal flashing: No. 15 perforated asphalt felt to CSA A123.3.

.4 Self-adhesive membrane underlay and tie-in membrane for metal flashings: Spun-bonded polyolefin sheathing conforming to CAN 2-51.32M77, with a water vapour permeance of 4800 Ng / Pa.s.m.2 and an air permeance of less than 0.2 L / sec m².

.5 Sealants: in accordance with Section 07 92 00 Joint Sealants, in colour to match flashing finish colour.

.6 Cleats and hook strips: of same material and temper as sheet metal, minimum one-third width of secured flashing continuous. Thickness same as sheet metal being secured.
.1 Provide continuous hook strip at outside of parapets.

.7 Nails: of same material as sheet metal, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.

.8 Screws: of same material as sheet metal, Suitable for substrate and material being fastened.

.9 Solder: to ASTM B 32, 50% pig lead – 50% pure block tin alloy.

.10 Flux: rosin, cut hydrochloric acid, or commercial preparation suitable for materials to be soldered.

2.03 FABRICATION

.1 Fabricate sheet steel flashings and other sheet steel work in accordance with applicable CRCA 'FL' series details and SMACNA architectural.

.2 Form pieces in 2400 mm maximum lengths.
.1 Make allowance for expansion at joints.

.3 Hem exposed edges on underside 12 mm.
.1 Mitre and seal corners with sealant.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply isolation coating to metal surfaces to be embedded in concrete or mortar.

2.04 METAL FLASHINGS

.1 Form flashings, copings, fascias gutters and rain water leaders to

profiles indicated of 0.694 mm thick copper.

2.05 PANS

.1 Form pans to receive roofing plastic from 0.694 mm thick copper sheet metal with minimum 75 mm upstand above finished roof and 100 mm continuous flanges with no open corners.
  .1 Solder joints.
  .2 Make pans minimum 50 mm wider than member passing through roof membrane.

2.06 REGLETS AND CAP FLASHINGS

.1 Form recessed reglets of 0.964 mm thick copper sheet metal to be built-in masonry work for base flashings as detailed.
  .1 Provide slotted fixing holes and steel/plastic washer fasteners.

2.07 EAVES TROUGHS AND DOWNPIPES

.1 Form eaves troughs and downpipes from 0.694 mm thick copper sheet metal.

.2 Sizes and profiles as indicated on drawing details.

.3 Provide goosenecks, outlets, strainer baskets and necessary fastenings.

.4 Form 600 x 600 mm splash pans from 0.694 mm thick copper sheet metal.

2.08 SCUPPERS

.1 Form scuppers from 0.694 mm thick copper sheet metal.

.2 Sizes and profiles as indicated on drawing details.

.3 Provide necessary fastenings.

.4 Form 600 x 600 mm splash pans from 0.694 mm thick copper sheet metal.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.02 INSTALLATION

.1 Install sheet metal work in accordance with CRCA FL series details.

.2 Use concealed fastenings except where approved before installation.

.3 Provide underlay under sheet metal.
  .1 Secure in place and lap joints 100 mm.
  .2 Provide self-adhesive membrane to tie into adjacent assemblies.

.4 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs.
.1 Flash joints using standing seams forming tight fit over hook strips, as detailed.

.5 Lock end joints and caulk with sealant.

.6 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.7 Insert metal flashing under cap flashing to form weather tight junction, as detailed.

.8 Turn top edge of flashing into recessed reglet or mortar joint minimum of 25 mm. Lead wedge flashing securely into joint.

.9 Caulk flashing at reglet with sealant.

.10 Install pans, where shown around items projecting through roof membrane.

.11 Where flashing installed with mechanical fasteners, install fasteners in slots or oversize holes to allow expansion and contraction of flashings.

.12 Provide isolation coating or impervious self-adhesive membrane to separate aluminum items from concrete and masonry.

3.03 EAVES TROUGHS AND DOWNPIPES

.1 Install eaves troughs and secure to building at 750mm on centre with eaves trough spikes through spacer ferrules.
.1 Slope eaves troughs to downpipes as indicated.
.2 Solder joints watertight.

.2 Install downpipes and provide goosenecks back to wall.
.1 Secure downpipes to wall with straps at 1800mm on centre; minimum two straps per downpipe.

.3 Install splash pans as indicated.

3.04 SCUPPERS

.1 Install scuppers as indicated.

3.05 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

.3 Leave work areas clean, free from grease, finger marks and stains.

3.06 SCHEDULE

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 61 00 - Common Product Requirements

.4 Section 01 74 11 - Cleaning.

.5 Section 01 78 00 - Closeout Submittals.

1.02 REFERENCE STANDARDS

.1 ASTM International
  .1 ASTM C 919-[08], Standard Practice for Use of Sealants in Acoustical Applications.

.2 Canadian General Standards Board (CGSB)
  .1 CGSB 19-GP-5M-[1984], Sealing Compound, One Component, Acrylic Base, Solvent Curing (Issue of 1976 reaffirmed, incorporating Amendment No. 1).
  .2 CAN/CGSB-19.13-[M87], Sealing Compound, One-component, Elastomeric, Chemical Curing.
  .3 CGSB 19-GP-14M-[1984], Sealing Compound, One Component, Butyl-Polyisobutylene Polymer Base, Solvent Curing (Reaffirmation of April 1976).
  .4 CAN/CGSB-19.17-[M90], One-Component Acrylic Emulsion Base Sealing Compound.
  .5 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound.

.3 General Services Administration (GSA) - Federal Specifications (FS)
  .1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (SDS).

.5 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  .1 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for joint sealants and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Manufacturer's product to describe:

.1 Caulking compound.
.2 Primers.
.3 Sealing compound, each type, including compatibility when different sealants are in contact with each other.

.3 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Samples:
.1 Submit 2 samples of each type of material and colour.
.2 Cured samples of exposed sealants for each colour where required to match adjacent material.

.4 Manufacturer's Instructions:
.1 Submit instructions to include installation instructions for each product used.

1.04 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

1.05 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
.1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect joint sealants from nicks, scratches, and blemishes.
.3 Replace defective or damaged materials with new.

1.06 SITE CONDITIONS

.1 Ambient Conditions:
.1 Proceed with installation of joint sealants only when:
.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.
.2 Joint substrates are dry.
.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 Joint-Width Conditions:
.1 Proceed with installation of joint sealants only where joint widths are more than those allowed by joint sealant manufacturer for applications indicated.

.3 Joint-Substrate Conditions:
.1 Proceed with installation of joint sealants only after contaminants capable of interfering with adhesion are removed from joint substrates.

1.07 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Material Safety Data Sheets (SDS) acceptable to Health Canada.

.2 Ventilate area of work as directed by Departmental Representative by use of approved portable supply and exhaust fans.

2 PRODUCTS

2.01 SEALANT MATERIALS

.1 Do not use caulking that emits strong odours, contains toxic chemicals or is not certified as mould resistant in air handling units.

.2 When low toxicity caulks are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.3 Where sealants are qualified with primers use only these primers.

2.02 SEALANT MATERIAL DESIGNATIONS

.1 Polysulfide two part:
.1 Self-levelling to CAN/CGSB-19.24, Type 1, Class B, colour to be determined by Departmental Representative.

.2 Polysulfide two part:
.1 Non-sag: to CAN/CGSB-19.24, Type 2, Class B, colour to be determined by Departmental Representative.

.3 Polysulfide one part:
.1 Self-levelling: to CAN/CGSB-19.13-M87, colour to be determined by Departmental Representative.

.4 Polysulfide one part:
.1 Non-sag: to CAN/CGSB-19.13-M87, colour to be determined by Departmental Representative.

.5 Urethanes two part:
.1 Self-levelling: to CAN/CGSB-19.24, Type 1, Class B, colour to be determined by Departmental Representative.

.6 Urethanes two part:
.1 Non-sag: to CAN/CGSB-19.24, Type 2, Class B, colour to be determined by Departmental Representative.

.7 Urethanes one part:
.1 Self-levelling: to CAN/CGSB-19.13, Type 1, colour to be determined by Departmental Representative.

.8 Urethanes one part:
  .1 Non-sag: to CAN/CGSB-19.13-M87, Type 2, colour to be determined by Departmental Representative.

.9 Silicones one part: to CAN/CGSB-19.13.

.10 Acrylics one part: to CGSB 19-GP-5M.

.11 Acrylic latex one part: to CAN/CGSB-19.17.

.12 Acoustical sealant: to ASTM C 919.

.13 Butyl: to CGSB 19-GP-14M.

.14 Preformed compressible and non-compressible back-up materials:
  .1 Polyethylene, urethane, neoprene or vinyl foam:
    .1 Extruded open cell foam backer rod.
    .2 Size: oversize 30%.
  .2 Neoprene or butyl rubber:
    .1 Round solid rod, Shore A hardness 70.
  .3 High density foam:
    .1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m^3 density, or neoprene foam backer, size as recommended by manufacturer.
  .4 Bond breaker tape:
    .1 Polyethylene bond breaker tape which will not bond to sealant.

2.03 SEALANT SELECTION

.1 Perimeters of exterior openings where frames meet exterior facade of building (i.e. brick, block, precast masonry): sealant type: 9 - Silicones one part.

.2 Control and expansion joints in exterior surfaces of unit masonry walls: sealant type: 9 - Silicones one part.

.3 Coping joints and coping-to facade joints: sealant type: 9 - Silicones one part.

.4 Cornice and wash (or horizontal surface joints): sealant type: 7 - Urethanes one part, self-leveling.

.5 Exterior joints in horizontal wearing surfaces: sealant type: 7 - Urethanes one part, self-leveling.

.6 Seal interior perimeters of exterior openings as detailed on drawings: sealant type: 8 - Urethanes one part, non-sag.

.7 Control and expansion joints on the interior of exterior surfaces of unit masonry walls: sealant type: 9 - Silicones one part.

.8 Perimeters of interior frames, as detailed and itemized: sealant type: 8 - Urethanes one part, non-sag.

2.04 JOINT CLEANER

.1 Non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's written recommendations.

.2 Primer: in accordance with sealant manufacturer's written recommendations.

3 EXECUTION

3.01 EXAMINATION

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

3.02 SURFACE PREPARATION

.1 Examine joint sizes and conditions to establish correct depth to width relationship for installation of backup materials and sealants.

.2 Clean bonding joint surfaces of harmful matter substances including dust, rust, oil grease, and other matter which may impair Work.

.3 Do not apply sealants to joint surfaces treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.4 Ensure joint surfaces are dry and frost free.

.5 Prepare surfaces in accordance with manufacturer's directions.

3.03 PRIMING

.1 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.04 BACKUP MATERIAL

.1 Apply bond breaker tape where required to manufacturer's instructions.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

3.05 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.06 APPLICATION

.1 Sealant:
- .1 Apply sealant in accordance with manufacturer's written instructions.
- .2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.
- .3 Apply sealant in continuous beads.
- .4 Apply sealant using gun with proper size nozzle.
- .5 Use sufficient pressure to fill voids and joints solid.
- .6 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.
- .7 Tool exposed surfaces before skinning begins to give slightly concave shape.
- .8 Remove excess compound promptly as work progresses and upon completion.

.2 Curing:
- .1 Cure sealants in accordance with sealant manufacturer's instructions.
- .2 Do not cover up sealants until proper curing has taken place.

3.07 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.
- .2 Clean adjacent surfaces immediately.
- .3 Remove excess and droppings, using recommended cleaners as work progresses.
- .4 Remove masking tape after initial set of sealants.

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

3.08 PROTECTION

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

.2 Repair damage to adjacent materials caused by joint sealants installation.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 45 00 - Quality Control.

.3 Section 01 56 00 - Temporary Barriers and Enclosures.

.4 Section 01 74 11 - Cleaning.

.5 Section 01 74 19 - Waste Management and Disposal.

.6 Section 07 92 00 - Joint Sealant.

.7 Section 09 91 00.08 – Painting for Minor Works.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 America Architectural Manufacturers Association (AAMA) / Window and Door Manufacturers Association (WDMS) / Canadian Standards Association (CSA)
  .1 AAMA/WDMA/CSA 101/I.S.2/A440 -[11], NAFS 2011 - North American Fenestration Standard/Specification for windows, doors, and skylights

.3 ASTM International
  .1 ASTM E 779-[10], Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.
  .2 ASTM E 1186 - [03(2009)], Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.
  .3 ASTM E 1827-[11], Standard Test Methods for Determining Air tightness of Buildings Using an Orifice Blower Door.
  .4 ASTM E 2178 -[13], Standard Test Method for Air Permeance of Building Materials.

.4 CSA Group
  .1 CAN/CSA-A440 -[00 (R2005)] Windows.
  .2 CAN/CSA-A440.2-[14]/A440.3-[14], Energy Performance of Windows and Other Fenestration Systems / User Guide to CSA A440.2-[04], Energy Performance of Windows and Other Fenestration Systems

.5 South Coast Air Quality Management District (SCAQMD), California State (SCAQMD)SCAQMD Rule 1113-[13], Architectural Coatings.
  .1 SCAQMD Rule 1168-[05], Adhesive and Sealant Applications.

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (SDS).

1.03 DEFINITIONS

.1 Ventilator: the operable sash of a wood casement window.

1.04 SEQUENCING

.1 Sequence work of this Section with work of Section 08 80 00 - Glazing.
- .1 Sequence work to suit scope of work specified:
- .2 Protect adjacent masonry around the window.
- .3 Remove window hardware.
- .4 Remove and repair existing wood sashes
- .5 Remove and repair window frame
- .6 Remove and repair window sill.
- .7 Install restored and repaired window components in window opening.
- .8 Repaint wood.
- .9 Re-install restored hardware.
- .10 Restore affected exterior finishes.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data.
- .1 Provide product data in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Manufacturers' printed data sheets.
  - .2 Material Safety Data Sheets (SDS).

.3 Shop Drawings.
- .1 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Samples.
  - .1 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.
    - .1 Replacement wood: 150 mm long samples for:
      - .1 Sills
      - .2 Stiles and Rails
      - .3 Muntin bars
      - .4 Parting strips
      - .5 Brick molds
    - .2 Replacement glazing.
    - .3 Replacement Hardware.
      - .1 Stay bars.
      - .2 Locks.
      - .3 Latches.
      - .4 Ventilator fasteners.
      - .5 Handles.
      - .6 Hinges.
      - .7 Pivots.
      - .8 Closing bars.
      - .9 Glazing beads.
      - .10 Cam fasteners.
      - .11 Spring catches.
      - .12 Roto operator.
      - .13 Sill pulls.
      - .14 Weather bars.
      - .15 Water dams.
    - .4 Weatherstripping: 150mm long samples for each type of application:

.1 Sprung bronze V-type
.2 Sprung bronze with thick felt between moving components
.5 Weatherseals.
.6 Gaskets.
.7 Backer rods.
.8 Sealants.
.9 Adhesives.
.10 Patching compounds.
.11 Epoxy.
.12 Screws, bolts and fasteners.
.13 Lubricants.
.14 Glazing compound.
.15 Component labels.

.3 Test and Evaluation Reports.
.1 Provide digital files of air leakage test evaluation reports.

1.06 CLOSEOUT SUBMITTALS

.1 Record Documentation.
.2 Provide digital files of photographic documentation before, during and after the wood window repairs.
.3 Provide digital files of Record drawings.

1.07 QUALITY ASSURANCE

.1 Qualifications.
.2 Work of this Section: only undertaken by Contractor experienced in conservation of historic wood window work and in traditional carpentry techniques required for repairing wood windows.

1.08 DELIVERY, STORAGE AND HANDLING

.1 Storage and handling of dismantled components:
.2 Protect from weather.
.3 Ensure easy accessibility.
.4 Store together in logical groupings.
.5 Pad, support and stack sashes and frames. Prevent damage to components.
.6 Maintain component labels in good condition and securely attached to components until re-installation.

1.09 WARRANTY

.1 12 month warranty period beginning at certification of Substantial Performance or correction of window related deficiencies, whichever date is later.

2 PRODUCTS

2.01 PERFORMANCE/DESIGN CRITERIA

.1 Air infiltration for primary (interior casement) sashes: to CAN/CSA-

A440.2/A440.3.

2.02 MATERIALS

.1 Existing components.
- .1 Glazing: Retain, restore and store existing glazing for re-installation.
- .2 Hardware: Retain, restore and store existing hardware for re-installation.
- .3 Sashes: Retain, restore and store existing sashes for re-installation.
- .4 Frame: Retain, restore and store existing frame for re-installation.

.2 Replacement wood components.
- .1 Eastern white pine, kiln dried.
- .2 Moisture content: maximum 12%, C select or better.
- .3 Unacceptable material types: finger-jointed, laminated.

.3 New Wood components.
- .1 Eastern white pine, kiln dried.
- .2 Sizes and shapes to match existing, where noted on Contract Drawings.
- .3 Temporary window opening inserts: plywood.

.4 New Glazing components.
- .1 Clear, float glass to match existing glass pane thickness. Assume 9mm thickness for pricing

.5 New Hardware.
- .1 Replacement Hardware introduced only where existing cannot be restored. Components may include:
  - .1 Stay bars.
  - .2 Locks.
  - .3 Latches.
  - .4 Ventilator fasteners.
  - .5 Handles.
  - .6 Hinges.
  - .7 Pivots.
  - .8 Closing bars.
  - .9 Glazing beads.
  - .10 Cam fasteners.
  - .11 Spring catches.
  - .12 Roto operator.
  - .13 Sill pulls.
  - .14 Weather bars.
  - .15 Water dams.

.6 Replacement Sash Balances.
- .1 Counterweight.
  - .1 Sash rope.
  - .2 Weight to match replaced component.
- .2 Spring.
- .3 Spiral.
- .4 Coiled tape.
- .5 Filler.
  - .1 Epoxy: one-part.
- .6 Replacement Fasteners.

.1 Screws: to match existing heads and threading.
.2 Match existing profile, size and head.
.3 Stainless steel grade 316.
.4 Replace existing fasteners with new fasteners to match existing profile, size, head, dimensions and configuration.
.5 Glazing bead fasteners: Replace existing fasteners with new fasteners to match existing profile, size, head, dimensions and configuration.

2.03 FINISHES

.1 Paint in accordance with Section 09 91 00.08 Painting For Minor Works.

.2 Paint System in accordance with Section 09 91 00.08 Painting For Minor Works.

2.04 ACCESSORIES

.1 Hardware: Retain, restore and store existing hardware for re-installation.

.2 Replacement Hardware (only where existing cannot be restored):
.1 Stay bars: sliding shoe, with screw-adjusted friction to match existing.
.2 Locks: to match existing.
.3 Latches: to match existing.
.4 Ventilator fasteners: to match existing.
.5 Handles: to match existing.
.6 Hinges: to match existing.
.7 Pivots: to match existing.
.8 Closing bars: to match existing.
.9 Glazing beads: to match existing.
.10 Cam fasteners: to match existing.
.11 Spring catches: to match existing.
.12 Roto operator: to match existing.
.13 Sill pulls: to match existing.
.14 Weatherbars: to match existing.
.15 Water dams: to match existing.

.3 Weatherseals.

.4 Gaskets.

.5 Backer rods.

.6 Sealants.

.7 Adhesives.

.8 Patching compounds.

.9 Epoxy.

.10 Screws, bolts and fasteners.

.11 Lubricants.

.12 Glazing compound.

.13 Component labels.

.14 Gaskets: 5mm deep non-adhesive neoprene strip gaskets, width to suit application.

.15 Sealant Bead.

.16 Glazing Materials.
- .1 Organic oil-based glazing compound.
- .2 Linseed oil.
- .3 Non-corroding glazing points.
- .4 Turpentine.

.17 Adhesive.
- .1 One-part epoxy formulated for architectural woodwork in exterior locations.

.18 Component labels for:
- .1 Wood components: sheet brass tag with hole at one end, punched with required component information, and secured to component with stainless steel wire.
- .2 Hardware components: sheet brass tag with hole at one end, punched with required component information, and secured to component with stainless steel wire.
- .3 Glazing components: gasket paper and waterproof marker. Secured to component with masking tape.

.19 Glazing compound: oil-based glazing putty.

.20 Transportation crates.
- .1 Prepare wood crates with padding for transporting window components to and from workshop.
- .2 Fabricate crates from:
  - .1 Lumber and plywood to suit.
  - .2 Padding: ethafoam.
  - .3 Fasteners to suit.

2.05 SHOP FABRICATION / REPAIR

.1 Surface preparation of frames and sashes. Remove paint products.
- .1 Conduct surface preparation work in shop.

.2 Make repairs of window units plumb, level, square and true.

.3 Existing Glazing Removal
- .1 Remove existing glazing lights from ventilators and label.
- .2 Remove existing glazing putty, paint and corrosion products from sash and frame.
- .3 Remove remnants of glazing putty with scrapers and razor blades.
- .4 Clean with acetone and absorbent cloths.
- .5 Replace broken glazing lights with new float glass of same thickness (assume 9mm thick for pricing).
- .6 Replace glazing broken during removal procedures at own expense.

.4 Surface preparation of frames and sashes. Remove paint products.
- .1 Conduct surface preparation work in shop.

.5 Splicing in new material.
- .1 Cut out damaged wood sections where indicated on Contract Drawings.
- .2 Splice in new wood sections to match profile of existing wood section.
- .3 Shop fit parts before connecting and gluing.
- .4 Corners of frames and sashes.
- .5 Cope corners.
- .6 Connect and dress corners.
- .7 Stile, rail and muntin joints: glue and plane smooth.

.6 Surface Voids.
- .1 Fill surface voids with compounds formulated for wood.
- .2 Build up surfaces where indicated on Contract Drawings. Apply patching compound.
- .3 Repair damaged area with two-pack resin and hardener.

.7 Broken cross-members and tenons.
- .1 Replace with new.

.8 New and existing glazing installation.
- .1 Sand and clean rebates.
- .2 Prime rebates with light coat of mix of equal parts of boiled linseed oil and turpentine. Allow to dry for 24 hours.
- .3 Apply back putty to rebate.
- .4 Bed glass firmly into position in rebate. Ensure it is evenly seated.
- .5 Install glazing points.
- .6 Neatly apply exterior putty bevel in line with edges of stiles and rails.
- .7 Strike off excess putty.
- .8 Allow putty to cure for minimum 3 weeks before shipping and painting.

.9 Replicate existing damaged hardware for replacements.

.10 Hardware restoration.
- .1 Strip paint using methylene chloride-based paint stripper. Take care not to damage patina. Clean with water. Dry thoroughly.
- .2 Straighten 50% of casement stay arms and 10% of closer bars.
- .3 Replace existing fasteners with new fasteners.
- .4 [Custom cast] [and][machine] replacement parts.
- .5 Steel latch hardware: after cleaning, apply microcrystalline wax.

.11 Re-assembly.
- .1 Replace existing fasteners with new fasteners.

.12 Prepare window components for transportation to site.
- .1 Prepare sashes with glazing stops temporarily installed.
- .2 Separately prepare glazing for transportation.
- .3 Pack repaired window components in crates and padding.
- .4 Transport to site.

2.06 SOURCE QUALITY CONTROL

.1 Make repair workshop accessible to Departmental Representative for inspection of work in progress.

3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

.1 This section must be in accordance with Section 01 45 00 – Quality Control.

3.02 PREPARATION

.1 Photograph window sash, frame elements and hardware.

.2 Install temporary enclosures in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.3 Protect window frames with tarpaulins for duration of the Work.
- .1 Protect from direct sun.
- .2 Keep dry.

.4 Identify, label and photograph window sash and frame elements.
- .1 Use same component designation as shown on Contract Drawings.
  - .1 Provide sufficient additional information: ensure component configuration and orientation is recorded on label.
  - .2 Record component label information on Contract Drawings.
  - .3 Labels: gasket paper marked with waterproof marker. Securely attach to component [on hidden surface].
  - .4 Metal components: ensure required component information is on sheet brass tag. Secure tag to component with stainless steel wire.
  - .5 Glazing components: ensure required component information is marked on gasket paper with waterproof marker. Securely attach to component [on hidden surface].
  - .6 Hardware: place component in sealable plastic bag. Ensure label visible in bag.

.5 Discuss with Departmental Representative intended approach for removal of window sash, frame and hardware.
- .1 Obtain Departmental Representative's approval of approach for removal of window frame and hardware.

.6 Notify Departmental Representative before removing window sash, frame and hardware.
- .1 Remove sashes, ventilators and frames from sub-frame, label components, carefully pack in crates and transport to shop for repairs.

3.03 PROTECTION OF IN-PLACE CONDITIONS

.1 Protect adjacent surfaces from damage prior to undertaking dismantling, in-situ repairs and refinishing.

.2 Window coverings and tracks: remove and store for re-installation.

3.04 IN-SITU RE-FINISHING

.1 Paint Removal
- .1 Remove existing paint with tools in the following order:
  - .1 Wire brush

.2 Wire wool
.3 Wet and dry sandpaper

.2 Undertake minor repairs including:
.1 Fill of the surface voids.
.1 Fill surface voids with compounds formulated for wood.
.2 Apply patching compound. Build up surfaces [where indicated on Contract Drawings].
.3 Slope built-up surfaces away from glazing.

.3 Re-painting and refinishing in accordance with Section 09 91 00.08 – Painting for Minor Works.
.1 Keep moving parts and flexible components free from primer and paint.
.2 Prime and seal oil-based glazing putties and mastic sealants.
.3 Apply one primer base coat to sashes and frame.
.4 Apply one epoxy base coat to sashes and frame.
.5 Apply one top coat to sashes and frame.

3.05 DISMANTLING EXISTING WINDOW SASHES

.1 General.
.1 Remove paint using stripping techniques.
.2 Avoid damaging materials and finishes adjacent to the windows being dismantled.
.3 Avoid damaging material and window components.
.4 Avoid marring, crushing or splitting components.
.5 Minimize risk of breakage: reinforce panes of glass with vinyl adhesive tape on both sides.
.6 Remove interior stop and parting bead.
.7 Remove lower or interior sash.
.8 Detach sash cords from sides of sash and pin (with a nail) or tie (in a knot) loose ends
.9 Carefully remove parting bead set in a groove in the center of stile.
.10 Remove upper sash.
.11 Remove glazing stops and glass panes from sash/ventilators.
.12 Retain dismantled components for duration of the Work.
.13 Cover window openings with plywood sheathing while the sash are out for repair.

.2 Label dismantled components, including hardware.
.1 Labels: gasket paper, marked with waterproof marker and securely attached to component on hidden surface.
.2 For smaller components such as hardware: place component in sealable plastic bag with label visible in bag.
.3 Mark "Property of Parks Canada" on hidden surface of disassembled components removed from site.

.3 Storage and handling of dismantled components.
.1 Protect from weather.
.2 Ensure easy accessibility.
.3 Store together in logical groups.
.4 Pad, support and stack sashes. Prevent damage to sashes.

.4 Removal of hardware and screws.
.1 Clean screw heads.
.2 Apply penetrating oil to screw heads 24 hours in advance of

removal.
.3 Use only screwdrivers that exactly fit screw heads.
.4 Retain and store for restoration removed hardware and screws.

.5 Components let into a groove or mortise, such as parting strips.
.1 Carefully and neatly cut adjacent paint using a sharp chisel or knife. Avoid tear out.

.6 Extraneous fasteners.
.1 Nails requiring removal: cut or pull nail through the back of component. Do not drive nail through face of component.
.2 Remove and discard extraneous fasteners.

.7 Removal of ventilators.
.1 Lift out ventilator from frame.
.2 Prepare, store and handle ventilators in accordance with Article [1.08] Delivery, Storage and Handling above.

3.06 REMOVAL OF WINDOW FRAME

.1 Selectively strip and remove, with care, adjacent components required to remove window frame.
.1 Remove as much of the window assembly as possible prior to removal of window frame, such as:
.1 Exterior.
.1 Remove brick mouldings.
.2 Interior.
.1 Remove jamb extensions.
.2 Remove interior stops.
.3 Remove lower sashes.
.4 Remove parting strips.
.5 Remove upper sashes.
.6 Remove wood trim and stool components.
.7 Cut back plaster, mortar and masonry back-up around interior perimeter of window frame.
.8 Access shim space and remove shims

.2 Carefully remove window frame from window masonry opening.

.3 Sub-frame to remain in place.

.4 Protect window and components and transport to off-site workshop.

.5 Prepare, store and handle frames in accordance with Delivery, Storage and Handling above.

3.07 CONFIRMATION OF SEALANT LOCATIONS FOR RE-INSTALLATION

.1 Inside and outside perimeters of window frame.
.2 Confirm sealant locations for re-installation of window frame with Departmental Representative during window removal process.
.3 Obtain Departmental Representative's approval for sealant locations.

3.08 INSTALLATION OF TEMPORARY WINDOW

.1 Install new insulated plywood window plugs, as described in Article [2.06.1], in window openings.

.1 Seal perimeter of plugs with strippable caulking.

3.09 REPAIR OF WINDOW FRAME

.1 Restore existing wood sill with epoxy as indicated.

.2 Stabilize joints in window frame:
.1 Add wood screws and glue blocks at locations that will be hidden when window frame is re-installed.
.1 Allow for each window frame corner to require this work.

.3 Repair minor holes, checks and small pockets of decay using epoxy as indicated.
.1 Allow for epoxy repairs in four locations per window frame.

3.10 SURFACE VOIDS

.1 Fill surface voids with filler.

.2 Build up surfaces where indicated on Contract Drawings. Apply patching compound.

.3 Repair damaged area with two-pack resin and hardener.

3.11 SPLICING IN NEW MATERIAL

.1 Material.
.2 Same wood species as existing parent wood component.
.3 Grain orientation to match existing parent wood component.

.2 Cut out damaged wood sections where indicated on Contract Drawings.

.3 Splice in new wood sections to match profile of existing wood section.

.4 Shop fit parts before connecting and gluing.

.5 Corners of frames and sashes.
.1 Cope corners.
.2 Connect and dress corners.

.6 Stile, rail and muntin joints: glue, plane and sand smooth.

3.12 DUTCHMAN REPAIRS

.1 Restore original profile and ensure proper fit of wood components:
.1 Repair damage in sashes and frames with Dutchman repairs.
.2 Employ Dutchman repairs only where wood is broken or missing.
.3 Areas with minor wear of wood are acceptable for re-use.

.2 Material.
.1 Same wood species as existing parent wood component.
.2 Grain orientation to match existing parent wood component.

.3 Joints.
.1 Ensure joints are tight and visible only on close inspection.
.2 Exterior exposed joints: weather tight, bevelled for moisture drainage to exterior.

.4 Application.

.1 Prepare damaged area of existing parent wood component for Dutchman repair.
.2 Cut out damaged wood sections where indicated on Contract Drawings.
.3 Splice Dutchman repair piece into parent wood component.
.4 Shop fit parts before connecting and gluing.
.5 Attach Dutchman repair piece to parent wood component only. Do not attach to adjacent wood component.
.6 Clamp repair piece in place until adhesive has set. Protect repair piece and other wood components from pressure marks.
.7 Avoid using surface fasteners.
.8 Larger Dutchman repairs:
.1 Fasten repair piece to parent wood component with brass or stainless steel screws, size to suit.
.2 Countersink screw and fill hole with wood plug.
.3 Match grain orientation of wood plug to parent wood component.
.9 Corners of frames and sashes.
.1 Cope corners.
.2 Connect and dress corners.
.10 Stile, rail and muntin joints glue, plane and sand smooth.

.5 Allow for Dutchman repairs identified on drawings.

3.13 REPAIR OF SASH

.1 Repair of Upper and Lower sash Stiles
.1 Cut out existing kerf and groove where indicated on Contract Drawings.
.2 Splice-in new wood Dutchman repair as described above.
.3 Cut in new kerf and groove: minimum size to suit hardware and weather stripping.

.2 Repair of bottom rail of lower hung sash
.1 Cut out existing kerf where indicated on Contract Drawings.
.2 Splice-in new wood Dutchman repair.
.3 Cut in new kerf: minimum size to suit weather stripping.

.3 Repair of meeting rails of hung sashes
.1 Cut back damaged existing wood where indicated on Contract Drawings.
.2 Splice-in new wood Dutchman repairs.

.4 Repair of interior wood stops
.1 Reduce width of existing wood stops by 6 mm as noted on Contract Drawings.
.2 Re-install interior wood stops in accordance with Contract Drawings.

.5 Parting strips repair
.1 Repair groove for parting strips where required. Cut out existing damaged portions and splice in new wood portions as required.
.2 Allow for repairs in four 4 locations, average length of 150 mm.
.3 Replace parting strips in pulley stiles.

.6 Weight boxes repair
.1 Allow for repairs to each weight box cover and adjacent area of window frame.

.2 Repair with glue or with splicing in new wood pieces.

.7 Existing Glazing.
- .1 Remove existing glazing lights from ventilators and label.
- .2 Remove existing glazing putty, paint and corrosion products from sash and frame.
- .3 Remove remnants of glazing putty with scrapers, chisels and razor blades.
- .4 Clean with acetone and absorbent cloths.
- .5 Replace broken glazing lights with new glass matching existing thickness.
- .6 Replace glazing broken during removal procedures at own expense.

.8 New glazing installation.
- .1 Sand and clean rebates.
- .2 Prime rebates with light coat of mix of equal parts of boiled linseed oil and turpentine. Allow to dry for 24 hours.
- .3 Apply back putty to rebate.
- .4 Bed glass firmly into position in rebate. Ensure it is evenly seated.
- .5 Install glazing points.
- .6 Neatly apply exterior putty bevel in line with edges of stiles and rails.
- .7 Strike off excess putty.

.9 Allow putty to cure for minimum 3 weeks before shipping and painting.

3.14 RE-PAINTING AND FINISHING

.1 Perform re-painting and finishing of wood windows in accordance with Section 09 91 00.08 – Painting for Minor Works.

.2 Priming and Painting.
- .1 Keep moving parts and flexible components free from primer and paint.
- .2 Prime and seal oil-based glazing putties and mastic sealants.
- .3 Apply one primer base coat to sashes and frame.
- .4 Apply one epoxy base coat to sashes and frame.
- .5 Apply one top coat to sashes and frame.

3.15 RESTORATION OF EXISTING HARDWARE

.1 Reuse existing hardware.

.2 Remove paint from hardware and screws:
- .1 Boil in vinegar.
- .2 Strip paint using methylene chloride-based paint strippers. Take care not to damage patina. Clean with water. Dry thoroughly.

.3 Lubricate parts including restored sash pulleys prior to re-installation.

.4 Straighten 50% of casement stay arms and 10% of closer bars.

.5 Replace existing fasteners with new fasteners.

.6 Custom cast and Machine replacement parts.

.7 Steel latch hardware: after cleaning, apply microcrystalline wax.

.8 Store restored hardware and screws for re-installation.

3.16 RE-INSTALLATION OF HARDWARE

.1 Reinstall hardware to operate smoothly.

.2 Lubricate hinges and moving parts with light machine oil.

3.17 SASH WEIGHTS

.1 Weigh pair of sash weights and weigh new upper sash. Ensure the combined weight of counterweights match the sashes to which they are attached.
  .1 Ensure pair of sash weights is 0.9 kg. heavier than upper sash.
    .1 Add or remove weight from pair of sash weights to achieve weight differential.

3.18 TRANSPORTATION TO SITE

.1 Brace restored window components to maintain squareness and rigidity during shipment and installation.

3.19 RE-INSTALLATION OF WINDOW FRAME

.1 Install air barrier material where required to around window opening.

.2 Window frame connections to masonry.
  .1 Replace existing steel angle brackets with new to suit.

.3 Ensure sub-frame is anchored securely in surrounding construction.

.4 Re-install restored and repaired window frame in sub-frame.

.5 Install new shims in shim space.

.6 Repair mortar and masonry back-up around interior perimeter of window frame as required.

.7 Apply backer rod and sealant around re-installed window frame.
  .1 Interior and exterior perimeters of re-installed window frame.
    .1 Install backer rod in locations agreed to with Departmental Representative during removal of window frame.
    .2 Apply sealant.

.8 Repair exterior adjacent material disturbed during removal of window frame.

3.20 INSTALLATION OF NEW JAMB EXTENSIONS

.1 Install solid backing behind new jamb extensions as indicated on Contract Drawings.

.2 Bed new jamb extensions into small bead of sealant.

.3 Fasten new jamb extensions at locations indicated on Contract Drawings.
  .1 Use 50mm wood screws 75mm from each corner and 300mm on centre.

Countersink and fill hole with wood plug. Wood plug to match grain orientation of new jamb extension.

3.21 REPAIR OF MORTAR AND MASONRY BACKUP

.1 Repair mortar and masonry back-up materials removed or disturbed during window removal.

.2 Build up mortar and masonry back-up materials in window opening to support re-installed window.

3.22 RE-INSTALLATION OF SASHES

.1 Install restored glazed upper and lower sashes with new weather stripping and associated trim such as weight pocket covers, parting strips and interior stops.

.2 Set units plumb, level and true to line.

.3 Ensure that lower sashes are operable for their full height.

.4 Seal upper sashes at sides and interior with latex caulking.

.5 Install weather-stripping
- .1 Coordinate installation of sash with installation of weather-stripping.
- .2 Install new weather-stripping in accordance with manufacturer's written instructions.
- .3 Install weather-stripping at locations indicated on Contract Drawings.
  - .1 Install weather-stripping in a fine, neat bed of silicone sealant.
- .4 Install new weather-stripping without breaks at corners and perimeter.

.6 Install new interior storm sashes with new weather-stripping and hardware.

.7 Apply final paint top coat to sash.

.8 After painting and finishing, install and adjust restored hardware.

.9 Adjust ventilators to operate smoothly in frames. Ensure smooth operation of new casement sashes and hardware.

3.23 REPAIR OF DISTURBED INTERIOR COMPONENTS

.1 Repair plaster around interior perimeter of window frame and any other damage caused during performance of the Work.

3.24 SEALANT BEAD APPLICATION

.1 Prime wood frame.

.2 Apply clean bead of sealant on primed frame.

.3 Install bond-breaker tape on operable sash.

3.25 CAULKING

.1 Apply sealant in accordance with Section 07 92 00 - Joint Sealant.

.2 Install sealant where indicated on Contract Drawings between exterior window frames and sills and perimeter masonry.

.3 Apply sealant after re-installation of shop-repaired windows and before final top coat of paint.

.4 Paint sealant.

3.26 SITE QUALITY CONTROL

.1 Evaluate performance of repaired windows and assemblies.

.2 Perform air leakage testing in accordance with ASTM E 779.

3.27 CLEANING

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

.2 Construction Waste Management.
  .1 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
  .2 Do not burn waste at project site.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 31 19 - Project Meetings.

.2 Section 01 33 00 - Submittal Procedures.

.3 Section 01 45 00 - Quality Control.

.4 Section 01 61 00 - Common Product Requirements.

.5 Section 01 74 11 - Cleaning.

.6 Section 01 74 19 - Waste Management and Disposal.

.7 Section 01 78 00 - Closeout Submittals.

.8 Section 07 92 00 - Joint Sealants.

1.02 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM C 542-[05], Standard Specification for Lock-Strip Gaskets.
- .2 ASTM D 790-[07e1], Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- .3 ASTM D 1003-[07e1], Standard Test Method for Haze and Luminous Transmittance of Plastics.
- .4 ASTM D 1929-[96(R2001)e1], Standard Test Method for Determining Ignition Temperature of Plastics.
- .5 ASTM D 2240-[05], Standard Test Method for Rubber Property - Durometer Hardness.
- .6 ASTM E 84-[10], Standard Test Method for Surface Burning Characteristics of Building Materials.
- .7 ASTM E 330-[02], Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .8 ASTM F 1233-[08], Standard Test Method for Security Glazing Materials and Systems.

.2 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-12.1-[M90], Tempered or Laminated Safety Glass.
- .2 CAN/CGSB-12.2-[M91], Flat, Clear Sheet Glass.
- .3 CAN/CGSB-12.3-[M91], Flat, Clear Float Glass.
- .4 CAN/CGSB-12.4-[M91], Heat Absorbing Glass.
- .5 CAN/CGSB-12.6-[M91], Transparent (One-Way) Mirrors.
- .6 CAN/CGSB-12.8-[97], Insulating Glass Units.
- .7 CAN/CGSB-12.8-[97] (Amendment), Insulating Glass Units.
- .8 CAN/CGSB-12.9-[M91], Spandrel Glass.
- .9 CAN/CGSB-12.10-[M76], Glass, Light and Heat Reflecting.
- .10 CAN/CGSB-12.11-[M90], Wired Safety Glass.
- .11 CAN/CGSB-12.12-[M90], Plastic Safety Glazing Sheets.

.12 CAN/CGSB-12.13-[M91], Patterned Glass.

.4 Environmental Choice Program (ECP)
.1 CCD-045-[95(R2005)], Sealants and Caulking Compounds.

.5 Glass Association of North American (GANA)
.1 GANA Glazing Manual - [2008].
.2 GANA Laminated Glazing Reference Manual - [2009].

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1168-[A2005], Adhesives and Sealants Applications.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:
.1 Convene pre-installation meeting 1 week prior to beginning on-site installation, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review [manufacturer's] written installation instructions and warranty requirements.

.2 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.

.3 Refer to section 01 31 19.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
.1 Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

.4 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be not returned for inclusion into work.
.3 Submit duplicate mm size samples of each type of glazing required.

.5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for [glazing] for incorporation into manual.

1.06 QUALITY ASSURANCE

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

1.07 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect glazing and frames from nicks, scratches, and blemishes.
- .3 Protect prefinished surfaces with wrapping.
- .4 Replace defective or damaged materials with new.

1.08 AMBIENT CONDITIONS

.1 Ambient Requirements:
- .1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
- .2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

2 PRODUCTS

2.01 MATERIALS

.1 Design Criteria:
- .1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
  - .1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.
- .2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to design pressure per ASTM E330.

.3 Limit glass deflection to 1/200 flexural limit of glass] with full recovery of glazing materials.

.2 Flat Glass:
.1 Float glass: to CAN/CGSB-12.3, of same thickness as existing window panes to facilitate localized replacement. Assume 9mm thickness for pricing purposes but allow for variations based on field measurements.

.3 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
.1 VOC limit 250 g/L maximum to SCAQMD Rule 1168.
.1 VOC limit: 5% maximum by weight to CCD-045.
.2 Ensure sealant does not contain chemical restrictions to CCD-045.

2.02 ACCESSORIES

.1 Setting blocks: silicone, 90 Shore A durometer hardness to ASTM D 2240, length of 25 mm for each square meter of glazing to suit glazing method, glass light weight and area.

.2 Spacer shims: silicone, 60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

.3 Glazing tape:
.1 Preformed butyl compound with integral resilient tube spacing device, 15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.
.2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

.4 Glazing splines: resilient silicone, extruded shape to suit glazing channel retaining slot, colour as selected by Departmental representative.

.5 Glazing clips: manufacturer's standard type.

.6 Lock-strip gaskets: to ASTM C 542.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
.1 Verify that openings for glazing are correctly sized and within tolerance.
.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
.3 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.4 Proceed with installation only after unacceptable conditions have been remedied.

3.02 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

3.03 INSTALLATION: EXTERIOR - DRY METHOD (PREFORMED GLAZING)

.1 Not used.

3.04 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

.1 Not used.

3.05 INSTALLATION: EXTERIOR - WET METHOD (SEALANT AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual for glazing installation methods.

.2 Place setting blocks at 1/4 points and install glazing light or unit.

.3 Install removable stops with glazing centred in space by inserting spacer shims both sides at 600 mm intervals, 6 mm below sight line.

.4 Fill gaps between glazing and stops with sealant to depth of bite on glazing, maximum 9 mm below sight line to ensure full contact with glazing and continue air and vapour seal.

.5 Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.
    .1 Remove traces of primer, caulking.
    .2 Remove glazing materials from finish surfaces.
    .3 Remove labels.
    .4 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.
  .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.07 PROTECTION

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

.2 After installation, mark each light with an "X" by using removable plastic tape or paste.
.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing installation.

3.08 SCHEDULE

.1 Refer to architectural drawings.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 35 29.06 - Health and Safety Requirements.

.3 Section 01 61 00 - Common Product Requirements.

.4 Section 01 74 00 - Cleaning.

.5 Section 01 74 19 - Waste Management and Disposal.

1.02 REFERENCE STANDARDS

.1 Standards and Guidelines for the Conservation of Historic Places in Canada – Second Edition (2010).

.2 Green Seal Environmental Standards (GS)
  .1 GS-11-[2008, 2nd Edition], Paints and Coatings.

.3 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
  .1 Material Safety Data Sheets (SDS).

.4 The Master Painters Institute (MPI)
  .1 Architectural Painting Specification Manual - [current edition].
  .2 Maintenance Repainting Manual - [current edition].

.5 National Research Council Canada (NRC)
  .1 National Building Code of Canada [2015] (NBC).

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
  .1 SCAQMD Rule 1113-[A2007], Architectural Coatings.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's instructions, printed product literature and data sheets for paint and coating products and include product characteristics, performance criteria, physical size, finish and limitations.
  .2 Submit two copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Samples:
  .1 Submit for review and acceptance of each unit.
  .2 Submit duplicate 200 x 300mm sample panels of each paint and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Painting Specification Manual standards.

.4 Certificates: submit product certificates signed by manufacturer

certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.04 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Provide and maintain dry, temperature controlled, secure storage.
- .2 Store painting materials and supplies away from heat generating devices.
- .3 Store materials and equipment in well ventilated area within temperature as recommended by manufacturer.

.4 Fire Safety Requirements:
- .1 Supply 1 9 kg Type ABC fire extinguisher adjacent to storage area.
- .2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.
- .3 Handle, store, use and dispose of flammable and combustible materials in accordance with National Fire Code of Canada (NFC) requirements.

1.05 SITE CONDITIONS

.1 Heating, Ventilation and Lighting:
- .1 Ventilate enclosed spaces in accordance with Section 01 51 00 - Temporary Utilities.
- .2 Co-ordinate use of existing ventilation system with Departmental Representative and ensure its operation during and after application of paint as required.
- .3 Provide minimum lighting level of 323 Lux on surfaces to be painted.

.2 Temperature, Humidity and Substrate Moisture Content Levels:
- .1 Apply paint finishes when ambient air and substrate temperatures at location of installation can be satisfactorily maintained during application and drying process, within MPI and paint manufacturer's prescribed limits.
- .2 Test concrete, masonry and plaster surfaces for alkalinity as required.
- .3 Apply paint to adequately prepared surfaces, when moisture content is below paint manufacturer's prescribed limits.

.3 Additional application requirements:
- .1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.
- .2 Apply paint in occupied facilities during silent hours only.

Schedule operations to approval of Departmental Representative such that painted surfaces will have dried and cured sufficiently before occupants are affected.

2 PRODUCTS

2.01 MATERIALS

.1 Supply paint materials for paint systems from single manufacturer.

.2 Conform to latest MPI requirements for painting work including preparation and priming.

.3 Materials in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual "Approved Product" listing.
- .1 Use MPI listed materials having E2 rating where indoor air quality requirements exist.
- .2 Primer: VOC limit 100 g/L maximum to GS-11.
- .3 Paint: VOC limit 100 g/L maximum to GS-11.

.4 Colours:
- .1 Submit proposed Colour Schedule to Departmental Representative for review].
- .2 Base colour schedule on selection of 3 base colours and 2 accent colours.

.5 Mixing and tinting:
- .1 Perform colour tinting operations prior to delivery of paint to site, in accordance with manufacturer's written recommendations. Obtain written approval from Departmental Representative for tinting of painting materials.
- .2 Use and add thinner in accordance with paint manufacturer's recommendations.
  - .1 Do not use kerosene or similar organic solvents to thin water-based paints.
- .3 Thin paint for spraying in accordance with paint manufacturer's written recommendations.
- .4 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

.6 Gloss/sheen ratings:
- .1 Paint gloss is defined as sheen rating of applied paint, in accordance with following values:

Gloss Level-Category	Gloss @ 60 degrees	Sheen @ 85 degrees
Gloss Level 1 - Matte Finish	Max. 5	Max. 10
Gloss Level 2 - Velvet	Max.10	10 to 35
Gloss Level 3 - Eggshell	10 to 25	10 to 35
Gloss Level 4 - Satin	20 to 35	min. 35

Gloss Level 5 - Semi-Gloss 35 to 70
Gloss Level 6 - Gloss 70 to 85
Gloss Level 7 - High Gloss More than 85

.2 Gloss level ratings of painted surfaces as noted on Finish Schedule.

.7 Exterior painting:

.1 Dimension Lumber: columns, beams, exposed joists, underside of decking, siding, fencing, etc.
.1 EXT 6.2B - Waterborne solid colour stain finish.
.2 EXT 6.2C - Alkyd Semi-gloss finish.
.3 EXT 6.2L - Semi-transparent stain finish.

.2 Dressed Lumber: doors, door and window frames, casings, battens, smooth facias, etc.
.1 EXT 6.3B - Alkyd Semi-gloss finish.
.2 EXT 6.3C - Solid colour stain finish [do not use in high contact areas or on doors].
.3 EXT 6.3D - Semi-transparent stain finish.

3 EXECUTION

3.01 GENERAL

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheets.

.2 Perform preparation and operations for interior painting in accordance with MPI - Architectural Painting Specifications Manual and MPI - Maintenance Repainting Manual except where specified otherwise.

3.02 EXAMINATION

.1 Investigate existing substrates for problems related to proper and complete preparation of surfaces to be painted. Report to [Departmental Representative] [DCC Representative] [Consultant] damages, defects, unsatisfactory or unfavourable conditions before proceeding with work.

.2 Conduct moisture testing of surfaces to be painted using properly calibrated electronic moisture meter, except test concrete floors for moisture using simple "cover patch test". Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

3.03 PREPARATION

.1 Protection of in-place conditions:
.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore surfaces as directed by Departmental Representative.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.
.3 Protect factory finished products and equipment.

.2 Surface Preparation:
.1 Remove electrical cover plates, light fixtures, surface hardware on doors, bath accessories and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations. Identify and store items in secure location and re-installed after painting is completed.
.2 Move and cover furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.
.3 Place "WET PAINT" signs in occupied areas as painting operations progress. Signs to approval of Departmental Representative.
.4 Clean and prepare surfaces in accordance with MPI - Architectural Painting Specification Manual and MPI - Maintenance Repainting Manual specific requirements and coating manufacturer's recommendations.
.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before prime coat is applied and between applications of remaining coats. Apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.
.6 Where possible, prime non-exposed surfaces of new wood surfaces before installation. Use same primers as specified for exposed surfaces.
.1 Apply vinyl sealer to MPI #36 over knots, pitch, sap and resinous areas.
.2 Apply wood filler to nail holes and cracks.
.3 Tint filler to match stains for stained woodwork.
.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.
.8 Clean metal surfaces to be painted by removing rust, loose mill scale, welding slag, dirt, oil, grease and other foreign substances in accordance with MPI requirements.
.9 Touch up of shop primers with primer as specified.

3.04 APPLICATION

.1 Paint only after prepared surfaces have been accepted by Departmental Representative.

.2 Use method of application approved by Departmental Representative
.1 Conform to manufacturer's application recommendations.

.3 Apply coats of paint in continuous film of uniform thickness.
.1 Repaint thin spots or bare areas before next coat of paint is applied.

.4 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.5 Sand and dust between coats to remove visible defects.

.6 Finish surfaces both above and below sight lines as specified for

surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.7 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 00 - Cleaning.

.3 Waste Management: separate waste materials in accordance with Section 01 74 19 - Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

.4 Place coatings defined as hazardous or toxic waste, including tubes and containers, in containers or areas designated for hazardous waste.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 02 41 13 – Selective Site Demolition.

.2 Section 32 12 16.01 - Asphalt Paving Short Form.

.3 Section 32 91 19.01 – Topsoil Placement and Grading.

.4 Section 32 92 19.13 – Mechanical Seeding.

1.02 REFERENCE STANDARDS

.1 ASTM International
  .1 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400ft-lbf/ft^3) (600kN-m/m^3).

.2 Ontario Provincial Standard Specifications (OPSS)/Ontario Ministry of Transportation
  .1 OPSS 1004, Material Specification for Aggregates - Miscellaneous.
  .2 OPSS 1010, Material Specification for Aggregates - Base, Subbase, Select Subgrade, and Backfill Material.

.3 U.S. Environmental Protection Agency (EPA)/Office of Water
  .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: arrange with authority having jurisdiction for relocation of buried services that interfere with execution of work.
  .1 Pay costs of relocating services.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit Granular material product data sheets from supplier a minimum of 2 weeks prior to commencing installation on-site.

.3 Site Quality Control Submittals: submit in accordance with Section 01 45 00 - Quality Control.
  .1 Submit condition survey of existing conditions as described in EXISTING CONDITIONS article.
  .2 Submit Granular Compaction test results in accordance with notes on drawing C1.2.

.4 Sustainable Design Submittals:
  .1 Erosion and Sedimentation Control: submit erosion and sedimentation control plan in accordance with authorities having jurisdiction.

2 PRODUCTS

2.01 MATERIALS

.1 Granular A and B Type I to OPSS 1010.

.2 19 mm round riverstone, smooth, colour varies.

3 EXECUTION

3.01 EXAMINATION

.1 Evaluation and Assessment:
  .1 Before commencing work establish locations of buried services on and adjacent to site.

3.02 PREPARATION

.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.

.2 Protection of in-place conditions:
  .1 Protect excavations from freezing.
  .2 Keep excavations clean, free of standing water, and loose soil.
  .3 Where soil is subject to significant volume change due to change in moisture content, cover and protect to Parks Canada Agency's or designate’s approval.
  .4 Protect natural and man-made features required to remain undisturbed. Unless otherwise indicated or located in an area to be occupied by new construction, protect existing trees from damage.
  .5 Protect buried services that are required to remain undisturbed.

.3 Removal:
  .1 Remove trees, stumps, logs, brush, shrubs, bushes, vines, undergrowth, rotten wood, dead plant material, exposed boulders, and debris within areas designated on drawings.
  .2 Remove stumps and tree roots below footings, slabs, and paving, and to 300mm below finished grade elsewhere.

3.03 EXCAVATION

.1 Strip topsoil over areas to be covered by new construction, over areas where grade changes are required, and so that excavated material may be stockpiled without covering topsoil.
  .1 Stockpile topsoil on-site for later use.

.2 Excavate for slabs and paving to subgrade levels.

.1 In addition, remove all topsoil, organic matter, debris, and other loose and harmful matter encountered at subgrade level.
.2 Excavations are limited to 500 mm from existing finished grade. Excavations deeper require written consent from Parks Canada Agency to proceed.

3.04 BACKFILLING

.1 Remove snow, ice, construction debris, organic soil, and standing water from spaces to be filled.

.2 Lateral support: maintain even levels of backfill around structures as work progresses, to equalize earth pressures.

.3 Compaction of subgrade: compact existing subgrade under walks, paving, and slabs on grade, to same compaction as fill.
.1 Fill excavated areas with selected subgrade compacted as specified for fill.

.4 Placing: place backfill, fill, and base course material in 150mm lifts. Add water as required to achieve specified density.

.5 Compaction: compact each layer of material to following densities for material to ASTM D 698:
.1 To underside of base courses: 98%.
.2 Base courses: 98%.
.3 Elsewhere: 90%.

.6 Under seeded and sodded areas: use site excavated material to bottom of topsoil except in trenches and within 600mm of foundations.

.7 Blown rock material, not capable of fine grading, is not acceptable, imported material must be placed on this type of material

.8 Against foundations (except as applicable to trenches and under slabs and paving): excavated material or imported material with no stones larger than 200mm diameter within 600mm of structures.

3.05 GRADING

.1 Grade so that water will drain away from buildings, walls, and paved areas, to catch basins and other disposal areas approved by Parks Canada Agency or designate.
.1 Grade to be gradual between finished spot elevations shown on drawings.

3.06 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.
.2 Dispose of cleared and grubbed material off site daily.

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

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 31 00 00.01 Earthworks Short Form.

1.02 REFERENCE STANDARDS

.1 American Association of State Highway and Transportation Officials (AASHTO)
- .1 AASHTO M320, Standard Specification for Performance Graded Asphalt Binder.
- .2 AASHTO R29, Standard Specification for Grading or Verifying the Performance Graded of an Asphalt Binder.
- .3 AASHTO T245, Standard Method of Test for Resistance to Plastic Flow of Bituminous Mixtures Using Marshall Apparatus.

.2 Asphalt Institute (AI)
- .1 AI MS-2, Mix Design Methods for Asphalt Concrete and Other Hot-Mixes.

.3 ASTM International
- .1 ASTM C 88, Standard Test Method for Soundness of Aggregates by Use of Sodium Sulphate or Magnesium Sulphate.
- .2 ASTM D 698, Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3)).

.4 Ontario Provincial Standard Specifications (OPSS)
- .1 OPSS 302, Construction Specification for Primary Granular Base.
- .2 OPSS 310, Construction Specification for Hot Mixed Asphalt.
- .3 OPSS 314, Construction Specification for Untreated Granular, Subbase, Base, Surface Shoulder and Stockpiling.
- .4 SP 110S13, Amendment to OPSS 1010, Material Specification for Aggregates, Granular A, B, M and Select Subgrade Material.
- .5 OPSS 1103, Material Specification for Emulsified Asphalt.
- .6 OPSS 1150, Material Specification for Hot Mixed Asphalt.

.5 U.S. Environmental Protection Agency (EPA)/Office of Water
- .1 EPA 832/R-92-005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for asphalt mixes and aggregate and include product characteristics, performance criteria, physical size, finish, and limitations.

.2 Submit viscosity-temperature chart for asphalt cement to be supplied showing either Saybolt Furol viscosity in seconds or Kinematic Viscosity in centistokes, temperature range 105 to 175 degrees C, 2 weeks prior to beginning Work.
.3 Inform Parks Canada Agency of proposed source of aggregates and provide test results, as per OPSS 1010.

.3 Samples:
.1 Erosion and Sedimentation Control: submit copy of erosion and sedimentation control plan in accordance with authorities having jurisdiction.

1.04 DELIVERY, STORAGE, AND HANDLING

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

.2 Stockpiling of bulk materials to be coordinated with Departmental Representative or designate on-site.

.3 Submit to Departmental Representative copies of freight and waybills for asphalt cement as shipments are received.
.1 Departmental Representative reserves right to check weights as material is received.

2 PRODUCTS

2.01 MATERIALS

.1 Aggregates to: SP 110S13.
.1 Granular A.
.2 Granular B Type I.

.2 Prime coat: MTO Primer to OPSS 1103.

.3 Tack coat: SS-1 to OPSS 1103.

.4 Asphalt concrete: to OPSS 1150.

3 EXECUTION

3.01 EXAMINATION

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

3.02 PAVEMENT THICKNESS

.1 Pavements for pathways 50mm HL3F.

3.03 PAVEMENT CONSTRUCTION

.1 Application of prime coat: OPSS 302.

.2 Construction of asphalt concrete: OPSS 310.

3.04 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.

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

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 31 00 00.01 Earthwork Short Form.

.2 Section 32 91 19.13 Mechanical Seeding.

1.02 REFERENCE STANDARDS

.1 Agriculture and Agri-Food Canada
  .1 The Canadian System of Soil Classification, Third Edition, 1998.

.2 Canadian Council of Ministers of the Environment
  .1 PN1340, Guidelines for Compost Quality.

.3 U.S. Environmental Protection Agency (EPA)/Office of Water
  .1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices.

1.03 DEFINITIONS

.1 Compost:
  .1 Mixture of soil and decomposing organic matter used as fertilizer, mulch, or soil conditioner.
  .2 Compost is processed organic matter containing 40% or more organic matter as determined by Walkley-Black or Loss On Ignition (LOI) test.
  .3 Product must be sufficiently decomposed (i.e. stable) so that any further decomposition does not adversely affect plant growth (C:N ratio below 25), and contain no toxic or growth inhibiting contaminates.
  .4 Composed bio-solids to: CCME Guidelines for Compost Quality, Category A.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit Topsoil supplier product data sheets a minimum of 2 weeks prior to commencing installation on-site.

1.05 WASTE MANAGEMENT AND DISPOSAL

.1 Do not dispose of unused soil amendments into sewer systems, into lakes, streams, onto ground, or in locations where it will pose health or environmental hazard.

2 PRODUCTS

2.01 TOPSOIL

.1 Topsoil for seeded areas: mixture of particulates, micro organisms, and organic matter which provides suitable medium for supporting intended plant growth.
  .1 Soil texture based on The Canadian System of Soil Classification, to consist of 20 to 70% sand, minimum 7% clay, and contain 2 to 10% organic matter by weight.
  .2 Contain no toxic elements or growth inhibiting materials.
  .3 Finished surface free from:
    .1 Debris and stones over 50mm diameter.
    .2 Course vegetative material, 10mm diameter and 100mm length, occupying more than 2% of soil volume.
  .4 Consistence: friable when moist.

3 EXECUTION

3.01 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.

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

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

3.02 PREPARATION OF EXISTING GRADE

.1 Verify that grades are correct.
  .1 If discrepancies occur, notify Parks Canada Agency and do not commence work until instructed by Parks Canada Agency or designate.

.2 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.3 Remove debris, roots, branches, stones in excess of 50mm diameter and other deleterious materials.
  .1 Remove soil contaminated with calcium chloride, toxic materials, and petroleum products.
  .2 Remove debris which protrudes more than 75mm above surface.
  .3 Dispose of removed material off site.

.4 Cultivate entire area which is to receive topsoil to minimum depth of 100mm.
  .1 Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

3.03 PLACING AND SPREADING OF TOPSOIL/PLANTING SOIL

.1 Place topsoil after Parks Canada Agency or designate has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150mm.

.3 For sodded areas keep topsoil 15mm below finished grade.

.4 Spread topsoil to following minimum depths after settlement.
- .1 150mm for seeded areas.
- .2 135mm for sodded areas.

.5 Manually spread topsoil/planting soil around trees, shrubs, and obstacles.

3.04 FINISH GRADING

.1 Grade to eliminate rough spots and low areas and ensure positive drainage.
- .1 Prepare loose friable bed by means of cultivation and subsequent raking.

.2 Consolidate topsoil to required bulk density using equipment approved by Parks Canada Agency or designate.
- .1 Leave surfaces smooth, uniform, and firm against deep footprinting.

3.05 SURPLUS MATERIAL

.1 Dispose of materials except topsoil not required off site.

3.06 CLEANING

.1 Proceed in accordance with Section 01 74 11 - Cleaning.

.2 Upon completion of installation, remove surplus materials, rubbish, tools, and equipment barriers.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 31 00 00.01 Earthwork Short Form.

.2 Section 32 91 19.01 Topsoil Placement and Grading.

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature, and data sheets for seed and fertilizer.
- .2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements.

.3 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

1.03 DELIVERY, STORAGE, AND HANDLING

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

.2 Delivery and Acceptance Requirements:
- .1 Labelled bags of fertilizer identifying mass in kg, mix components and percentages, date of bagging, supplier's name, and lot number.
- .2 Fertilizer must be dry.

.3 Storage and Handling Requirements:
- .1 Store fertilizer in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Replace defective or damaged materials with new.

1.04 WARRANTY

.1 For seeding, 12 months warranty period is extended to 24 months.

2 PRODUCTS

2.01 GRASS SEED

.1 Grass seed mixture:

55% Creeping Red Fescue
27% Kentucky Blue
15% Perennial Rye Grass
3% White Clover

.2 In packages individually labelled in accordance with "Seeds Regulations" and indicating name of supplier.

2.02 WATER

.1 Free of impurities that would inhibit germination and growth.

.2 Water for required irrigation will be supplied via hydrant or hose bib.

2.03 FERTILIZER

.1 To Canada "Fertilizers Act" and Regulations.

.2 Complete synthetic fertilizer with guaranteed minimum analysis as specified.

3 EXECUTION

3.01 EXAMINATION

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

3.02 INSTALLERS

.1 Use installers members in Good Standing of Landscape Ontario Horticultural Trades Association.

3.03 SEED BED PREPARATION

.1 Do not perform work under adverse field conditions as determined by Departmental Representative or designate.

.2 Remove and dispose of weeds; debris; stones 50mm in diameter and larger; soil contaminated by oil, gasoline and other deleterious materials; off site in accordance with all applicable local regulations.

.3 Verify that grades are correct. If discrepancies occur, notify Parks Canada Agency and commence work when instructed by Departmental Representative or designate.

.4 Fine grade surface free of humps and hollows to smooth, even grade, elevations indicated to tolerance of plus or minus 15mm, surface draining naturally.

.5 Cultivate fine graded surface approved by Departmental Representative or designate to 25mm depth immediately prior to seeding.

3.04 SEED PLACEMENT

.1 Ensure seed is placed under supervision of certified Landscape Planting Supervisor.

.2 For mechanical seeding:
  .1 Mechanical landscape drill seeder ("Brillion" type or equivalent) which accurately places seed at specified depth and rate and rolls in single operation.

.3 For manual seeding:
  .1 Use manually operated drop seeder ("Cyclone" type or equivalent).
  .2 Use manually operated, water ballast, landscaping type, smooth steel drum roller.

.4 Blend applications 150mm into adjacent grass areas to form uniform surfaces.

.5 Sow half of required amount of seed in one direction and remainder at right angles as applicable.

.6 Incorporate seed by light raking in cross directions.

.7 Consolidate mechanically seeded areas by rolling area if soil conditions warrant or if directed by Departmental Representative with equipment approved by Departmental Representative immediately after seeding.

3.05 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.
  .2 Keep pavement and area adjacent to site clean and free from mud, dirt, and debris at all times.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools, and equipment in accordance with Section 01 74 11 - Cleaning.
  .1 Clean and reinstate areas affected by Work.

3.06 PROTECTION

.1 Erect plastic snow fence around newly seeded areas sufficient to protect against deterioration due to pedestrian or other traffic.

3.07 MAINTENANCE DURING ESTABLISHMENT PERIOD

.1 Ensure maintenance is carried out under supervision of certified Landscape Maintenance Supervisor.

.2 Perform following operations from time of seed application until acceptance by Parks Canada Agency or designate:
  .1 Water seeded area to maintain optimum soil moisture level for germination and continued growth of grass. Control watering to prevent washouts.
  .2 Repair and reseed dead or bare spots to allow establishment of seed prior to acceptance.

.3 Cut grass to 50mm whenever it reaches height of 70mm. Remove clippings which will smother grass as directed by Parks Canada Agency or designate.
.4 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.
.5 Adjust protection barrier as necessary to protect against deterioration due to pedestrian or other traffic as needed.

3.08 FINAL ACCEPTANCE

.1 Seeded areas will be accepted by Parks Canada Agency or designate provided that:
.1 Areas are uniformly established free of rutted, eroded, bare, or dead spots and extent of weeds apparent in grass is acceptable.
.2 Areas have been cut at least twice to 50mm after reaching a height of 70mm.

.2 Areas seeded in fall will be accepted in following spring, one month after start of growing season provided acceptance conditions are fulfilled.

3.09 MAINTENANCE DURING WARRANTY PERIOD

.1 Perform following operations from time of acceptance until end of warranty period:
.1 Water seeded area to maintain optimum soil moisture level for continued growth of grass. Control watering to prevent washouts.
.2 Repair and reseed dead or bare spots to satisfaction of Departmental Representative or designate.
.3 Cut grass to 50mm whenever it reaches height of 70mm. Remove clippings which will smother grass as directed by Departmental Representative or designate.
.4 Fertilize seeded areas in accordance with fertilizing program. Spread half of required amount of fertilizer in one direction and remainder at right angles.
.5 Control weeds by mechanical or chemical means utilizing acceptable integrated pest management practices.

END OF SECTION