

Project Manual:

STRUCTURAL STABILIZATION OF HOUGH HOUSE AT FORT MALDEN NATIONAL HISTORICAL SITE

**100 Laird Avenue
Amherstburg, Ontario**

Project No.: 30018527
Consultant Project No.: 13-05-0004

Date: 2014 03 03: Issued for Tender

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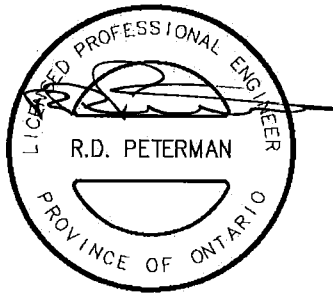
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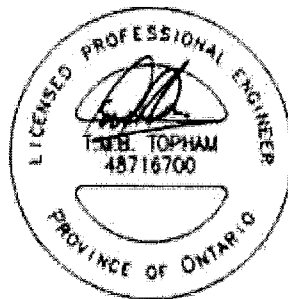
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Integrated Engineering



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Integrated Engineering

END OF SECTION

1.1 Description

1 General

.1 These detailed specifications cover the requirements for the furnishing for providing all labour, materials, tools, equipment, power plant, systems, transportation and supervision necessary to completely perform the work, as described by the Drawings and the Specifications .

. 2 Description of Work

- .1 The structural stabilization of Hough House at Fort Malden National Historic Site as described in the following and as detailed on the drawings and in these specifications. The general scope of work includes:
- .1 The provision of all access and conveyance required to efficiently complete the work within the allotted time frame by the completion date. Access is required to all areas of the building.
 - . 2 Supply, install, maintain and dismantle all fencing hoarding and scaffolding access as called for on the drawings and/or as required to complete the work. Provide protection to all features which may be affected by the work and to the satisfaction of the Departmental Representative or Designate.
 - . 3 Complete all floor reinforcing as indicated on the plans as indicated in the documents or as directed by the Departmental Representative or Designate.
 - .4 Removal of existing finishes including gypsum wall board, plaster, suspended gypsum board ceilings, plaster ceilings, light fixtures, heat and smoke detectors, sprinkler piping, plumbing fixtures, etc as required for the installation of reinforcing columns, beams and framing as indicated on the plans and as directed by the Departmental Representative or Designate.
 - . 5 Salvage existing wood casings, plumbing fixtures, electrical fixtures as required for reinstallation.
 - .6 Repair all finishes to existing condition or as indicated once reinforcing is complete to the satisfaction of the Departmental Representative or Designate.
 - .7 Re-certify all life safety devices complete in the building including but not limited to Fire Alarm, sprinkler system, heat and smoke detectors, emergency lighting, electrical devices, etc.
 - .8 Remove existing exterior mounted emergency walkway and ladder assembly. Complete wall repairs and infilling of affected masonry elements and roofing as required.
 - .9 Coordinate removals and protection of interior surfaces and displays to remain with the Departmental Representative as required.

1.2 Location of the Work

- .1 Hough House is located on the west side of the Fort Malden National Historic Site, 100 Laird Avenue, Amherstburg, Ontario adjacent to the Detroit River.

1.3 Relics and Antiquities

- .1 Buried artifacts, the remains and evidence of ancient persons and peoples, and any objects of historic value and worth remain the property of the Crown. Any and all such

objects shall be protected and immediately brought to the knowledge of the Departmental Representative or Designate.

- .2 Archaeologists may be on site to monitor work to ensure no archaeological resources are damaged. Advise Departmental Representative and receive direction regarding protecting of such resources should any be discovered by either archaeology or the contractor. The contractor could be directed to stop work on the area and redirect work elsewhere until the issue is resolved to the Departmental Representative's or Designates satisfaction.

1.4 Standards

- .1 Reference is made to CGSB, ASTM, CSA and other National and International standards. These standards, when quoted, form an integral part of and are to be read in conjunction with the specification as if reproduced herein. The latest edition is applicable, unless a dated edition is specified.

1.5 Abbreviations

- .1 OPSS - Ontario Provincial Standard Specifications.
- .2 CGSB - The Canadian General Standards Board.
- .3 CSA- Canadian Standards Association.
- .4 CWB - Canadian Welding Bureau.
- .5 CAN2 -A National Standard of Canada, published by CGSB.
- .6 CAN3 -A national Standard of Canada, published by CSA.
- .7 ASTM- American Society for Testing and Materials.
- .8 ACI -American Concrete Institute.
- .9 ANSI -American National Standards Institute.
- .10 OBC - Ontario Building Code
- .11 NBC- National Building Code of Canada.
- .12 JIC - Joint Industrial Conference, Hydraulic Standards for Industrial Equipment.
- .13 NLGA- National Lumber Grades Authority.
- .14 AWWA- American Water Works Association.

1.6 Minimum Standards

- .1 Execute work to meet or exceed:
 - .1 The more stringent of the Ontario Building Code or the National Building Code of Canada.
 - .2 Rules and regulations of authorities having jurisdiction.
 - .3 Fire Commissioner of Canada, No. 301, Standard for Construction Operations, and No. 302, Standard for Welding and cutting, June 1982, Occupational Safety and Health, Chapter 3-6, Feb. 1992 .
 - .4 Occupational Health and Safety Act and Regulations for Construction Projects, Revised Statutes of Ontario 1990, Chapter 0.1 as amended, 0. Reg. 213/91 as amended by 0. Reg. 631/94, R.R.O. 1990, Reg. 834 .
 - .5 Ontario Regulation 347 as amended by regulation 558/00.
 - .6 Environmental Protection Act, 0. Reg. 102/94 and 0. Reg. 103/94.
- .2 Unless the context clearly indicates otherwise, the following definitions apply.
 - .1 Fort Malden - the entire site, grounds including all buildings.
 - .2 Plans - the drawings listed in the "List of Drawings" or supplied as part of the Contract .
 - .3 Specification - the subject matter listed in the "Index to Specification", Addenda to the Specification and all relative written communications sent by the

Departmental Representative or Designate to the Contractor in connection with the work.

- . 4 Department - Parks Canada Agency.

1.7 Taxes

- .1 Pay applicable Federal, Provincial and Municipal taxes.

1.8 Fees, Permits and Certificates

- .1 Provide authorities having jurisdiction with information requested.
- .2 Pay fees and obtain certificates and permits required.
- .3 Furnish certificates and permits when requested.

1.9 Examination

- .1 Before submitting tender, examine existing conditions and determine conditions affecting work.
- .2 Obtain all information which may be necessary for proper execution of Contract.

1.10 Site

- .1 Confine work, including temporary structures, plant, equipment and materials to established limits of the Contractor's work and storage area.
- .2 Locate temporary buildings, roads, walks, drainage facilities and, services as directed and maintain in clean and orderly manner.

1.11 Construction and Storage Area

- .1 The limits of the work and Storage Area will be as indicated on the Drawings. No additional area for work and storage has been arranged and it should not be assumed to be available. All surrounding ground is under the authority of the Parks Canada.
- .2 The work and storage area shall be delineated and fenced or hoarded to prevent access from the general public.
- .3 Gates for equipment, deliveries and access shall be configured and signed to discourage entry by the public and unauthorized personnel.

1.12 Documents

- .1 Keep on site one complete copy of contract documents including revisions, shop drawings, etc.

1.13 Units of Measure

- .1 Items measured for payment are in metric (SI) units.
- .2 Submit requests for payment in metric units corresponding with items in the Unit Price Table.
- .3 Submit supporting documents in metric units. Perform all necessary conversions required.

1.14 As-built Record Drawings

- .1 As work progresses, neatly record significant deviations from the Contract drawings using fine, red marker on full size white prints.
- .2 Neatly print lettering and numbers in size to match original. Lines may be drawn free-hand but shall be neat and accurate. Add at each title block note: "AS BUILT RECORD."
- .3 Record the following significant deviations:
 - .1 Depths of various elements and foundations.

- . 2 Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
- . 3 Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
- . 4 Field changes of dimension.
- . 5 Other significant deviations whether they are concealed in construction and can not be identified by visual inspection or are visible after construction.
- . 4 Turn one set of As-Built Record Drawings over to Departmental Representative or Designate on completion of work.
- . 5 If project is completed without deviations from contract drawings declare this in writing and submit to Departmental Representative or Designate in lieu of As-Built Record Drawings.

1.15 Additional Drawings

- .1 Departmental Representative or Designate may furnish additional drawings to clarify work.
- . 2 Such drawings become part of Contract Documents.

1.16 Layout of Work

- .1 Immediately upon entering site for purpose of beginning work on this project, locate all general reference points and take proper action necessary to prevent their disturbance .
- . 2 Supply stakes and other survey markers required for this work. Employ competent personnel to lay out work in accordance with existing lines and grades.
- . 3 Maintain all reference points and markers for duration of contract.

1.17 Co-operation and Protection

- .1 Execute work with minimum disturbance to occupants, public and normal use of the surrounding grounds. Make arrangements with Departmental Representative or Designate to facilitate use of grounds during the execution of work.
- . 2 Maintain access and exits .
- . 3 Provide necessary barriers, warning lights and signs. Protect work from damage. Replace damaged existing work with material and finish to match standards for new work.

1.18 Existing Utilities

- .1 Establish location, protect and maintain existing utility lines.
- .2 There are wiring and control lines buried on site. Protect the wiring and sensors throughout the project. Identify sensors and wires that prevent completion of the work, to the Departmental Representative or Designate, prior to removal. Obtain approval to remove or relocate wiring and direction from the Departmental Representative or Designate as to how to move the wire/sensor prior to disturbing the wiring or sensor.

1.19 Material and Equipment

- .1 Use new products unless otherwise specified.
- .2 Deliver and store material and equipment to manufacturer's instructions with manufacturer's labels and seals intact.
- . 3 When material or equipment is specified by standard or performance specifications, upon request of Departmental Representative or Designate, obtain from manufacturer an independent testing laboratory report, stating that material or equipment meets or exceeds specified requirements.

1.20 Inspection and Testing

- .1 The Departmental Representative or Designate may employ an Inspection and Testing company to ensure work conforms with Contract Documents.
- .2 When initial tests and inspections reveal work not to contract requirements, pay for subsequent tests and inspections required by Departmental Representative or Designate on the corrected work and at any intermediate stage necessary to ensure the quality of the work.
- .3 The Owner reserves the right to assess other work which may be rejected as being of similar nature to that for which failed tests result was obtained.

1.21 Progress Photographs

- .1 As soon as work commences, take weekly progress photographs from 3 locations.
- .2 View points, which will best illustrate progress of work, will be selected by the Departmental Representative or Designate.
- .3 Forward duplicate electronic copies of digital photographs and one 200mm x 250mm colour paper copy of each progress photograph to Departmental Representative or Designate each week. Provide date and project information in the file name of each digital photograph. The Departmental Representative or Designate shall review the photographs to determine that the photographs have not been altered.

1.22 Site Meetings

- .1 Site meetings will be held at a maximum interval of every two weeks.
- .2 Ensure that all key site personnel and a representative from the contractor who is designated to speak on behalf of the Contractor and, can commit the contractor to action, is present at the meetings.

1.23 Dimensions

- .1 All dimensions, elevations or soundings shown on the Contract Drawings are to be considered as approximate only. Any as constructed dimensions that are required are to be measured and expressed in metres or mm on shop drawings and as-built drawings.

1.24 Protection of the Structure

- .1 Prevent overloading of any part of the structure.
 - . 1 Do not cut, drill or sleeve any structural member, unless specifically indicated, without written approval of the Departmental Representative or Designate.
 - . 2 Review construction loading including wind loading from scaffold and ensure that loads are applied to members that are capable of supporting forces.
 - . 3 Detail and obtain approval for any protection coverings to be employed to interior and exterior surfaces of the building..

1.25 Measurement .and Payment

- .1 This Contract is prepared on the basis of contract lump sum with a for all specified works as described on the Contract drawings and in these specifications. Payment to be based on Cost Breakdown submitted by Contractor
- .2 The contract lump sum item shall include all work delineated on the drawings and in this specification that is not specifically included in a unit price item. Any work that is considered incidental to or essential to any of the items shall be included in that item. Where incidental or essential work is required and it is not evident where it should be included it shall be included in the "Contract Lump Sum" item.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 14 00 – Work Restrictions.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

- .1 Work of this Contract comprises interior structural stabilization to floor structures and roof fanning to the Hough House, located at Fort Malden National Historic Site, 100 Laird Avenue, Amherstburg, Ontario and further identified as Project No. 30018527.

1.3 CONTRACT METHOD

- .1 Construct Work under stipulated price contract

1.4 TIMING SCHEDULE

- .1

1.5 HOURS OF WORK

- .1

1.6 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 or Designate, in writing, any defects which may interfere with proper execution of Work.

1.7 WORK SEQUENCE

- .1 Construct Work in stages to accommodate Departmental Representative or Designate intermittent use of premises washrooms during construction.

1.8 CONTRACTOR USE OF PREMISES

- .1 Unrestricted use of defined work area as indicated on drawings.
- .2 Limit use of premises outside of Work area for Work, for storage, and for access:
 - .1 As indicated on drawings.
- .3 Co-ordinate use of premises under direction of Departmental Representative or Designate.
- .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.

1.9 OWNER OCCUPANCY

- .1 Parks Canada Agency will move all items from building as noted in the documents. The Departmental Representative or Designate will not occupy the building during the construction period.
- .2 Co-operate with Departmental Representative or Designate in scheduling operations to minimize conflict and work to facilitate Departmental Representative or Designate usage of the site grounds for un-guided walks. The contractor is to minimize the impact to the Heritage Site..

1.10 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, co-ordinate with Departmental Representative or Designate for duration and timing and give 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 Departmental Representative or Designate.
- .3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative or Designate of findings.
- .4 Submit schedule to and obtain approval from Departmental Representative or Designate for any shutdown or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide adequate bridging over trenches which cross sidewalks or roads to permit normal traffic.
- .6 Where unknown services are encountered, immediately advise Departmental Representative or Designate and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.
- .9 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.11 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.
 - .12 Environmental Management Plan

1.12 FIRE SAFETY REQUIREMENTS

- .1 Comply with the National Building Code of Canada 2000 (NBC) for fire safety in construction and the National Fire Code of Canada 2005 (NFC) for fire prevention, fire fighting and life safety in building in use.
- .2 Comply with Human Resources and Skills Development Canada (HRSDC), Labour Canada, Fire Protection Engineering Services standards.
 - .1 No. 301: Standard for Construction Operations.
 - .2 No. 302: Standard for Welding and Cutting.
 - .3 No. 374: Fire Protection Standard for General Storage (Indoor and Outdoor).
 - .4 Available from Fire Protection Engineering Services, Labour Program, HRSDC or following Internet site:
http://www.hrsdc.gc.ca/eng/labour/fire_protection/policies_standards/commissioner/index.shtml
 - .5 Retain all fire safety documents and standards on site.
- .3 Welding and cutting:
 - .1 Before welding, soldering, grinding and/or cutting work, obtain a permit from the Fire Prevention Unit as directed by the Departmental Representative or Designate. Store flammable liquids in approved CSA containers inspected by the Fire Prevention Unit. No open flame shall be used unless authorized by the Fire Prevention Unit.
 - .2 At least 48 hours prior to commencing cutting, welding or soldering procedure, provide to Departmental Representative or Designate:
 - .1 Notice of intent, indicating devices affected, time and duration of isolation or bypass.
 - .2 Completed welding permit as defined in FC 302.
 - .3 Return welding permit to Departmental Representative or Designate immediately upon completion of procedures for which permit was issued.
 - .3 A fire watcher as described in FC 302 shall be assigned when welding or cutting operations are carried out in areas where combustible materials within 10m may be ignited by conduction or radiation.

1.13 Relics and Antiquities

- .1 Buried artifacts, the remains and evidence of ancient persons and peoples, and any objects of historic value and worth remain the property of the Crown. Any and all such objects shall be protected and immediately brought to the knowledge of the Departmental Representative or Designate.
- .2 Archaeologists may be on site to monitor work to ensure no archaeological resources are damaged. Advise Departmental Representative and receive direction regarding protecting of such resources should any be discovered by either archaeology or the contractor. The contractor could be directed to stop work on the area and redirect work elsewhere until the issue is resolved to the Departmental Representative's or Designates satisfaction.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- | | | |
|----|---------------------|--|
| .1 | Section 01 74 21 | Construction-Demolition Waste Management |
| .2 | Section 06 01 10.91 | Rough Carpentry Restoration |
| .3 | Section 09 21 00 | Lath & Plaster |
| .4 | Section 09 25 00 | Gypsum Board |
| .5 | Section 09 91 00 | Painting |

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 APPLICATION

- .1 Do Work as noted herein.

3.2 INTERIOR ELEVATIONS

- .1 See appendix A, B C and D for photographic references

BASEMENT ELEVATIONS

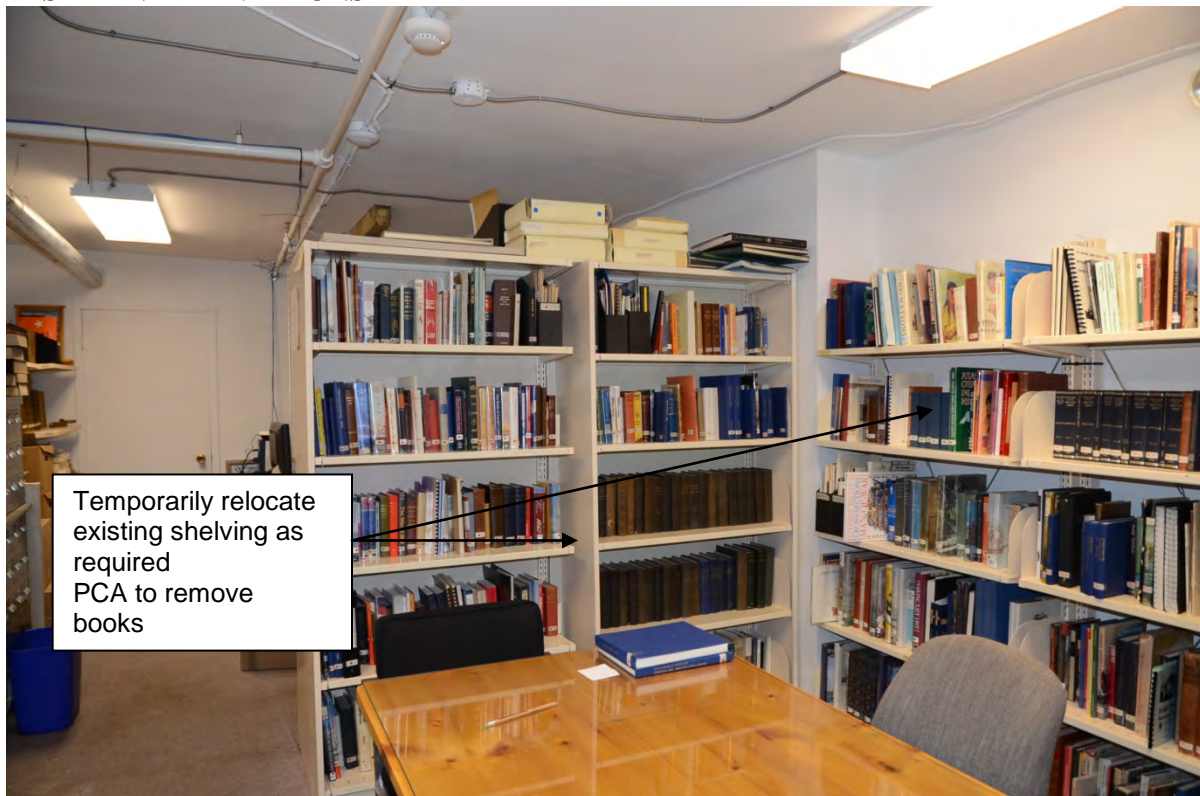


Figure 001 - Library 001



Figure 002 - Library 001



Figure 003 - Library 001



Figure 004 - File Storage 001A



Figure 005 - Laundry 004



Figure 006 - Mechanical Room 005

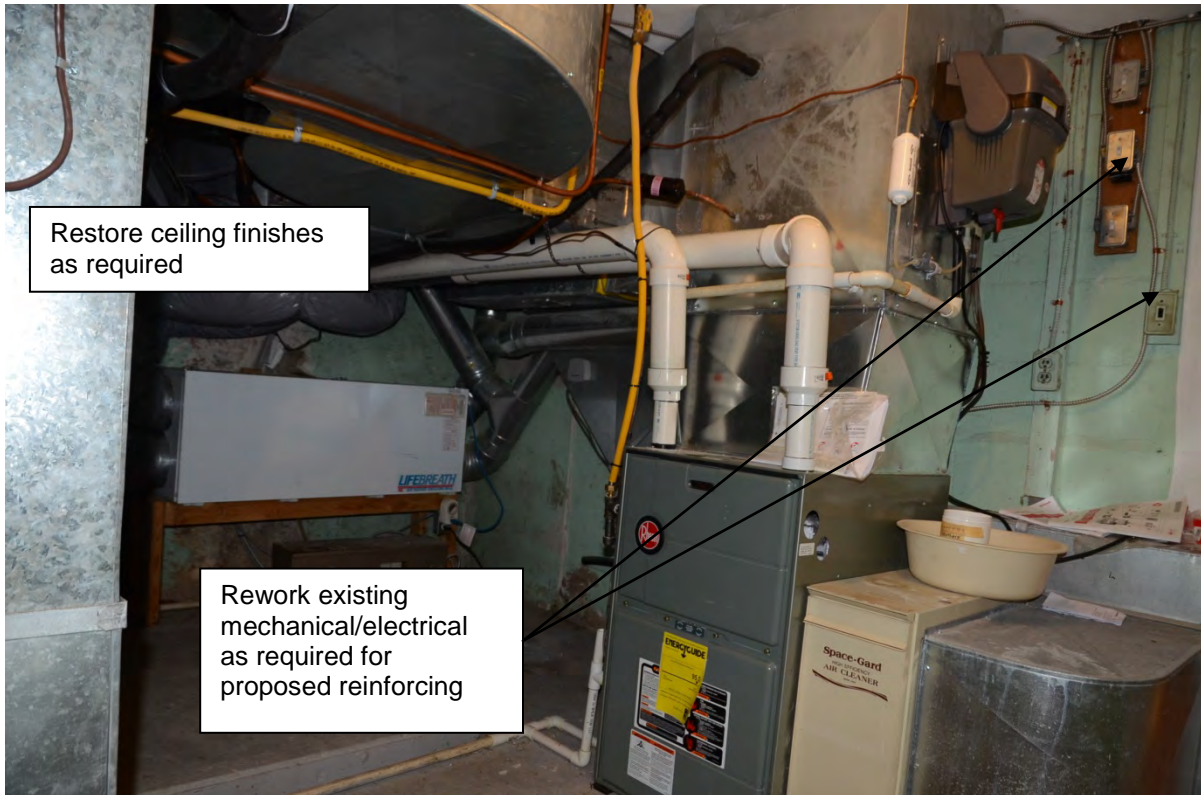


Figure 007 - Mechanical Room 005

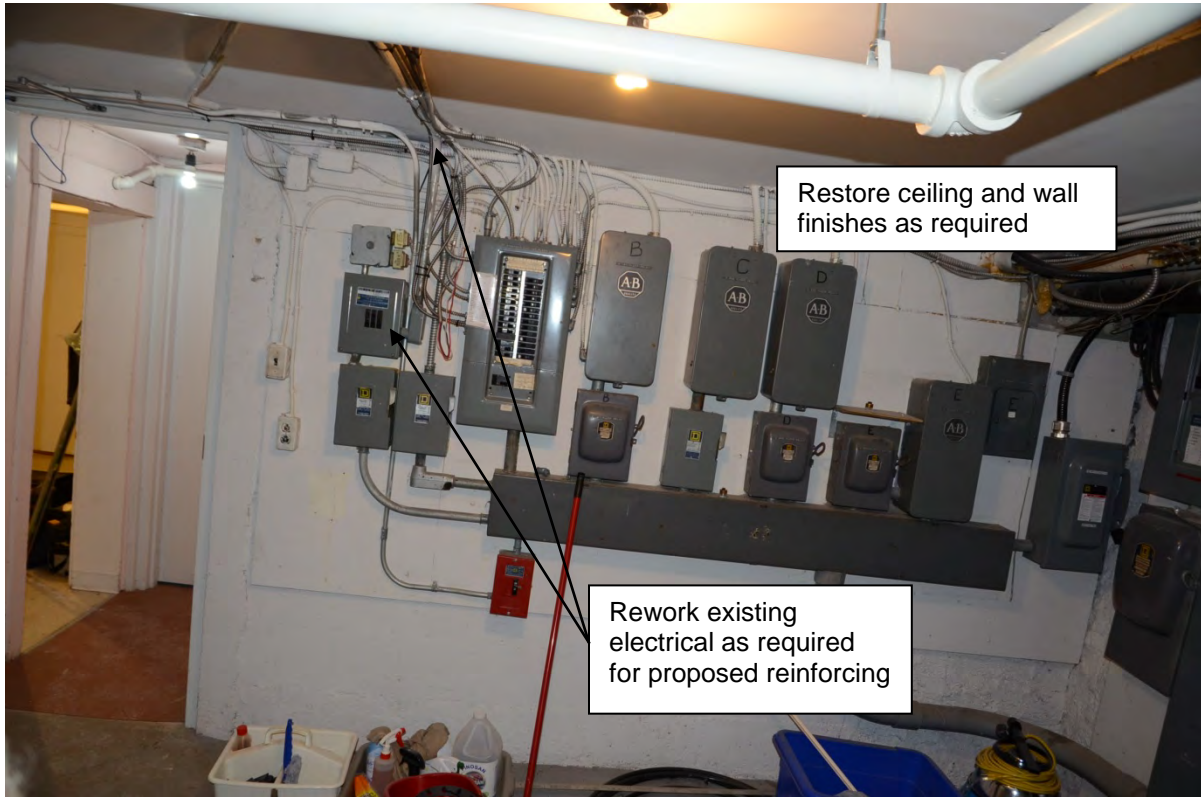


Figure 008- 006 Electrical Room

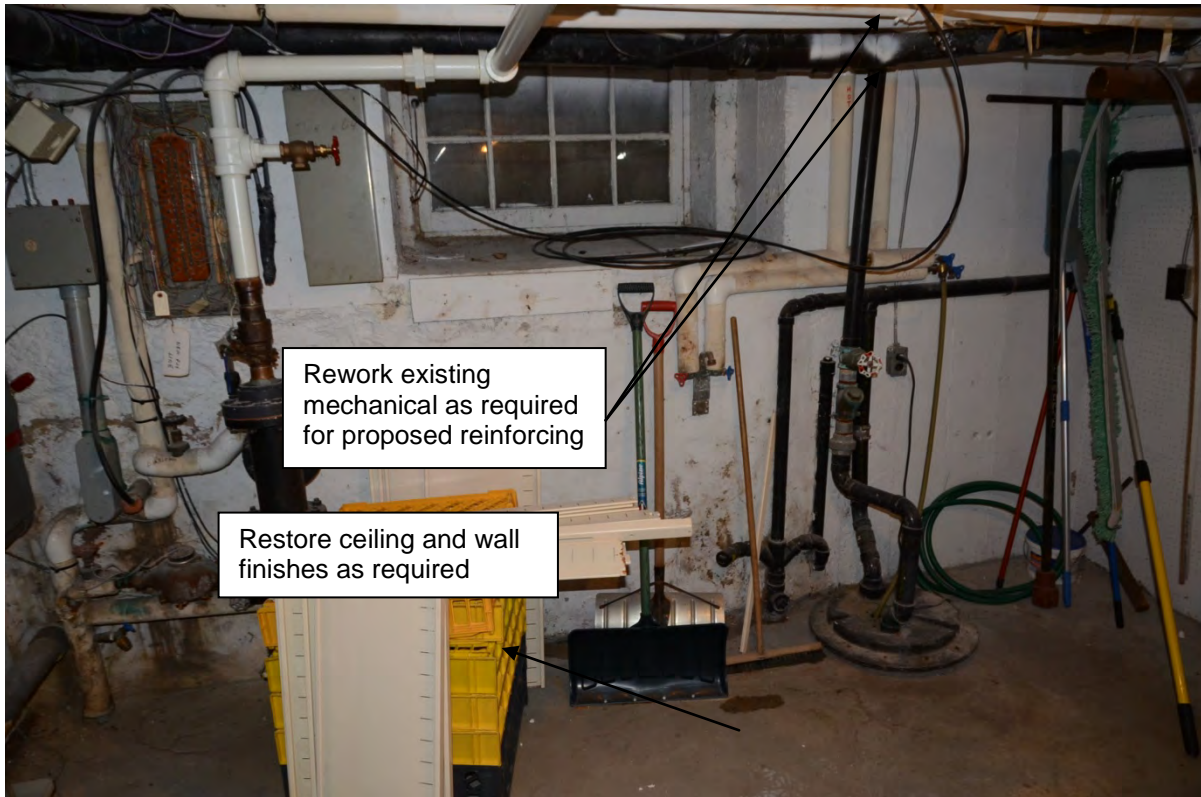


Figure 009 - Electrical Room 006



Figure 010 - Artefacts 007

END OF BASEMENT ELEVATIONS

GROUND FLOOR ELEVATIONS



Figure 101 - Lobby 102

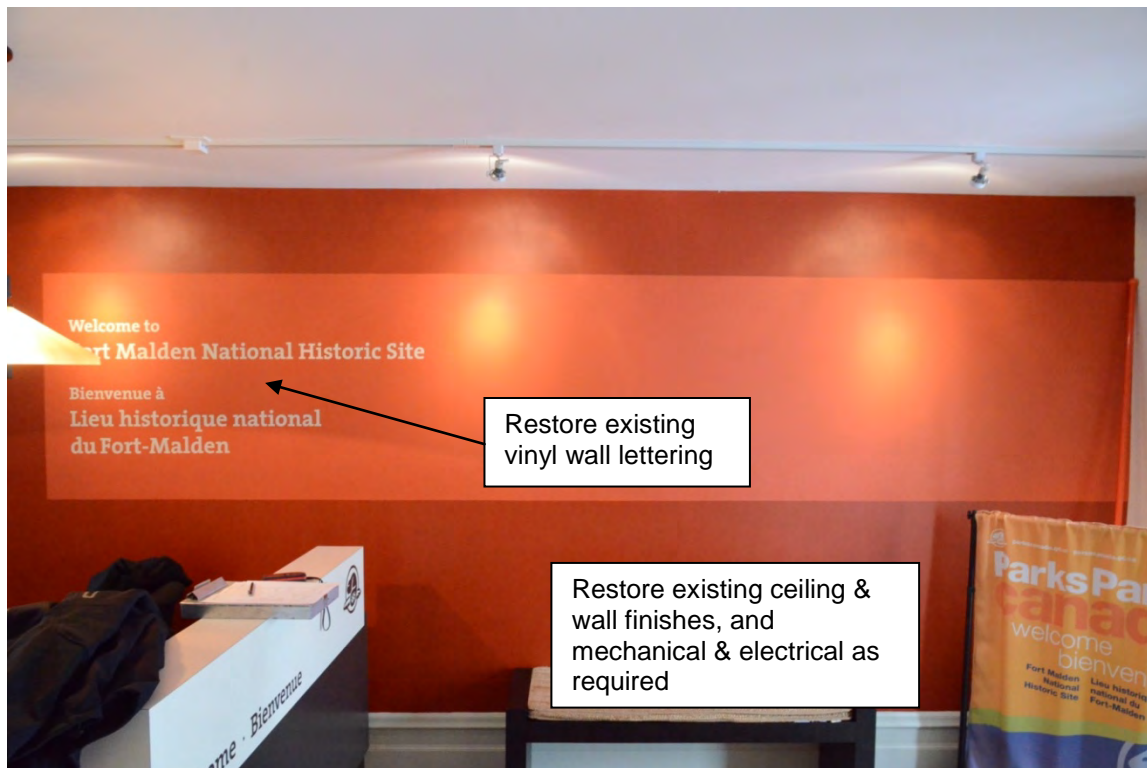


Figure 102 - Lobby 102

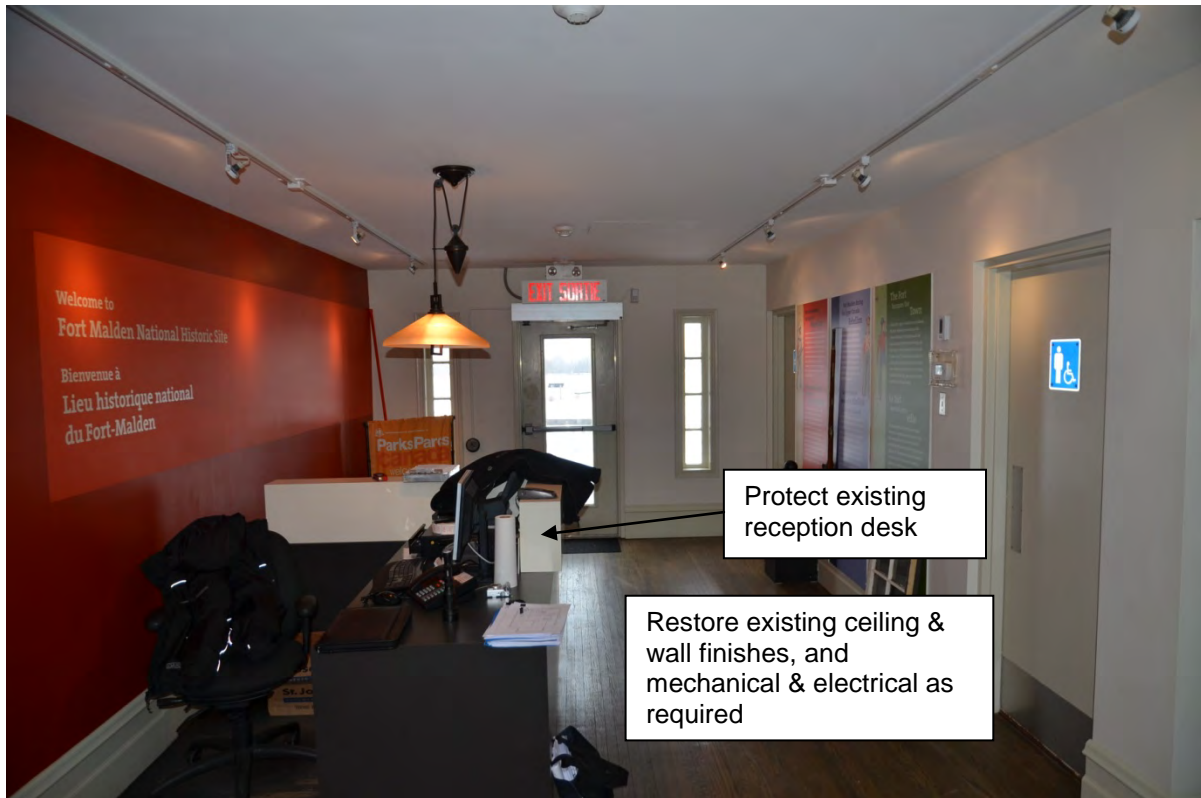


Figure 103 - Lobby 102

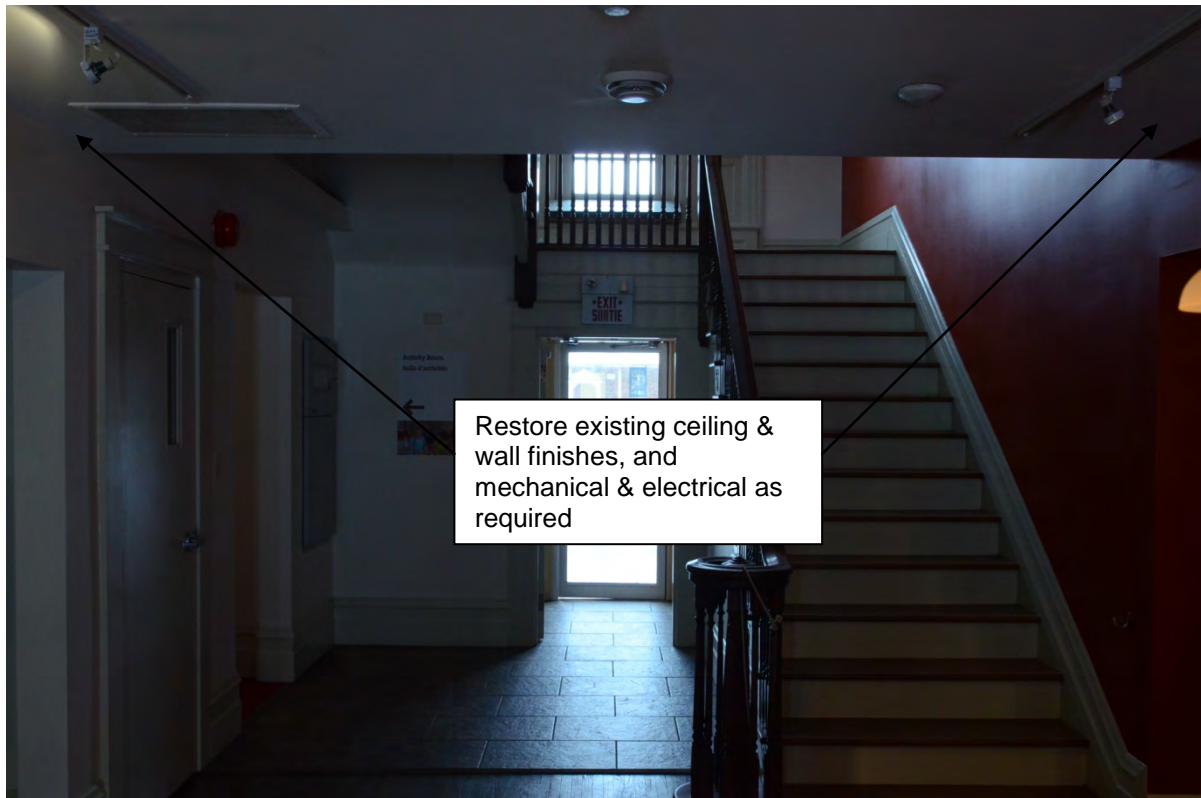


Figure 104 - Lobby 102

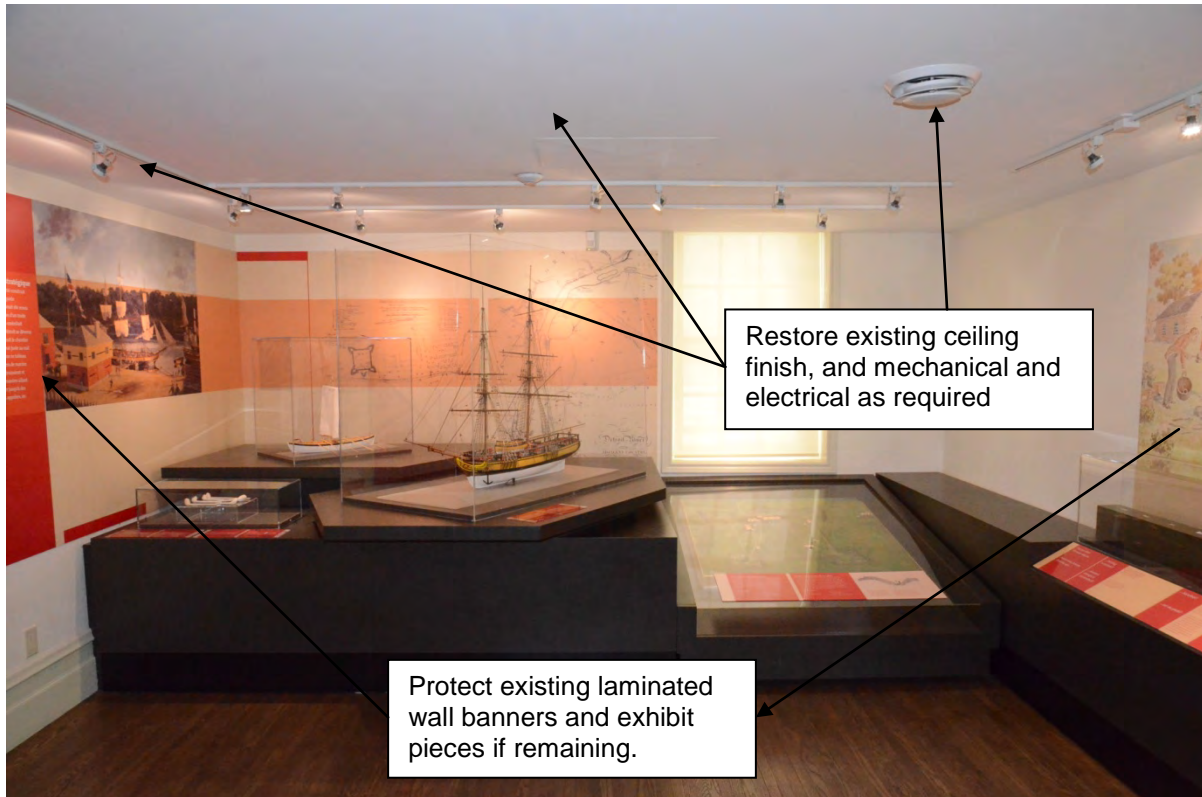


Figure 105 - Display Room 103

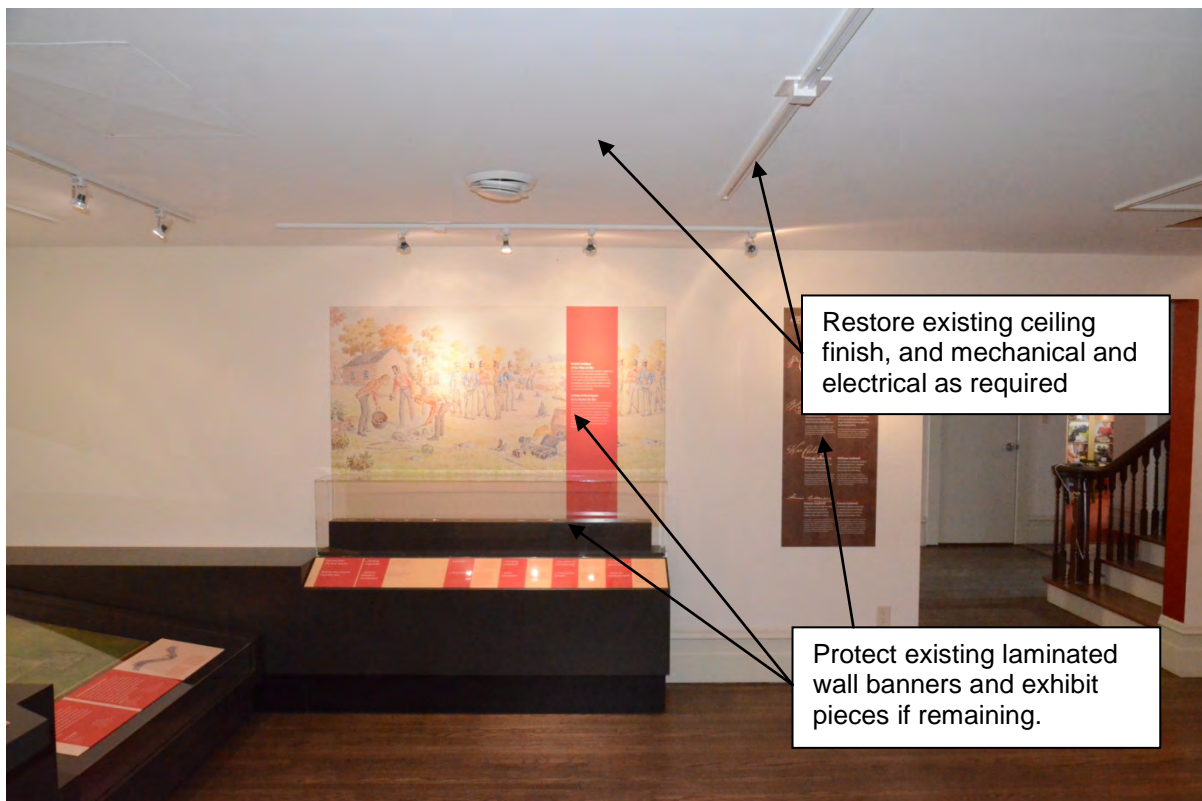


Figure 106 - Display Room103



Protect existing laminated wall banners and exhibit pieces if remaining.

Figure 107 - Display Room 103



Protect and/or temporarily remove existing laminated wall banners and exhibit pieces as required if remaining.

Figure 108 - Display Room 103



Existing stone has been removed by Owner.

Protect and/or temporarily remove existing laminated wall banners and exhibit pieces if remaining.

Figure 109 - Display Room 103



Protect existing laminated wall banner if remaining.

Figure 110 - Children's Display 107

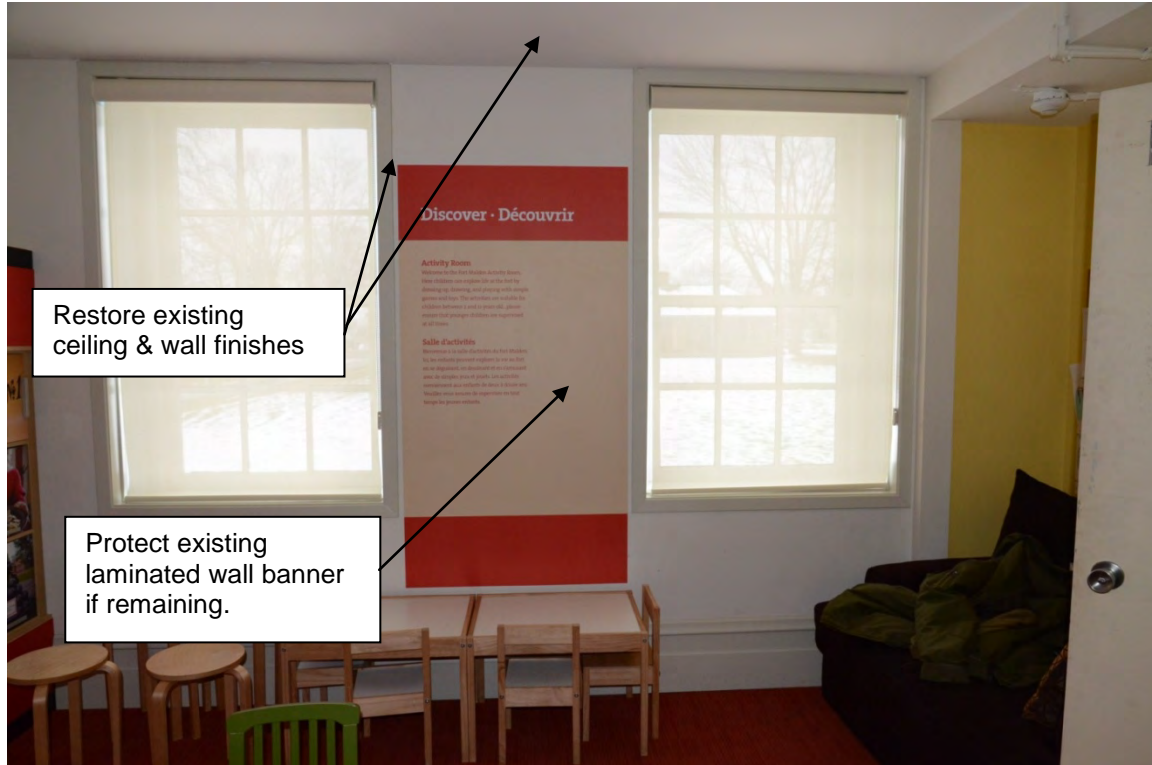


Figure 111 - Children's Display 107

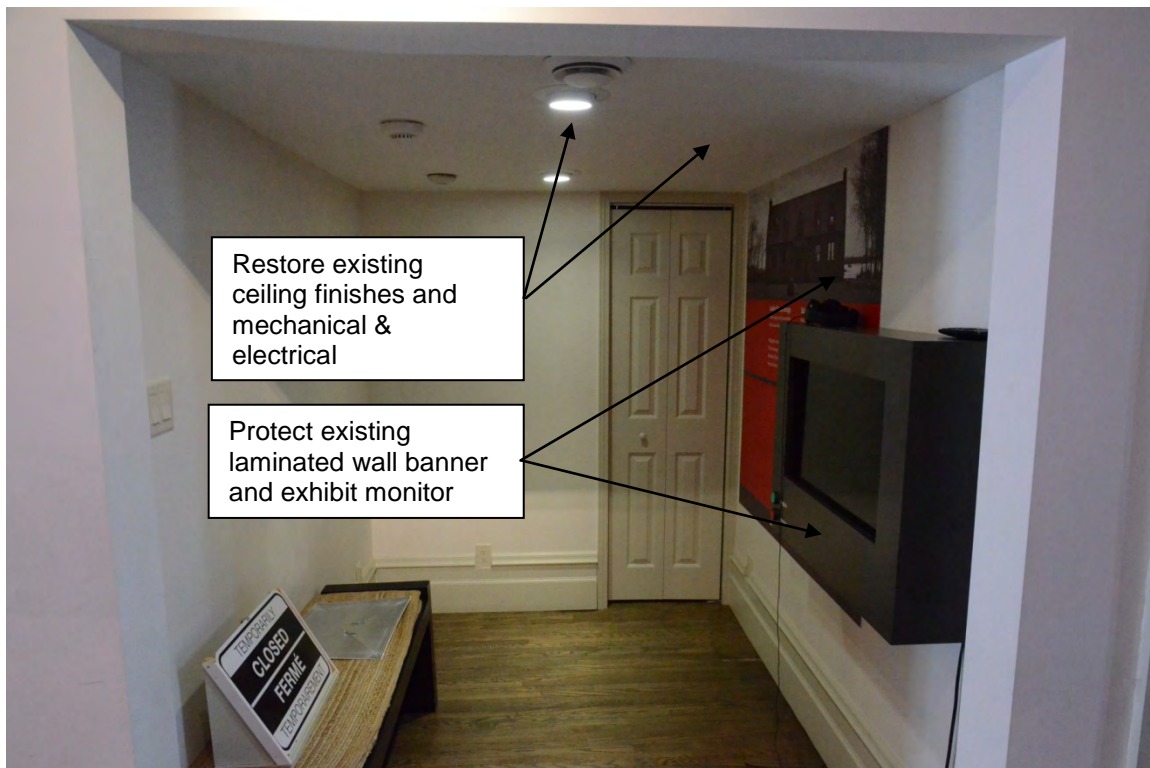


Figure 112 - Display Room 106

END OF GROUND FLOOR ELEVATIONS

SECOND FLOOR ELEVATIONS

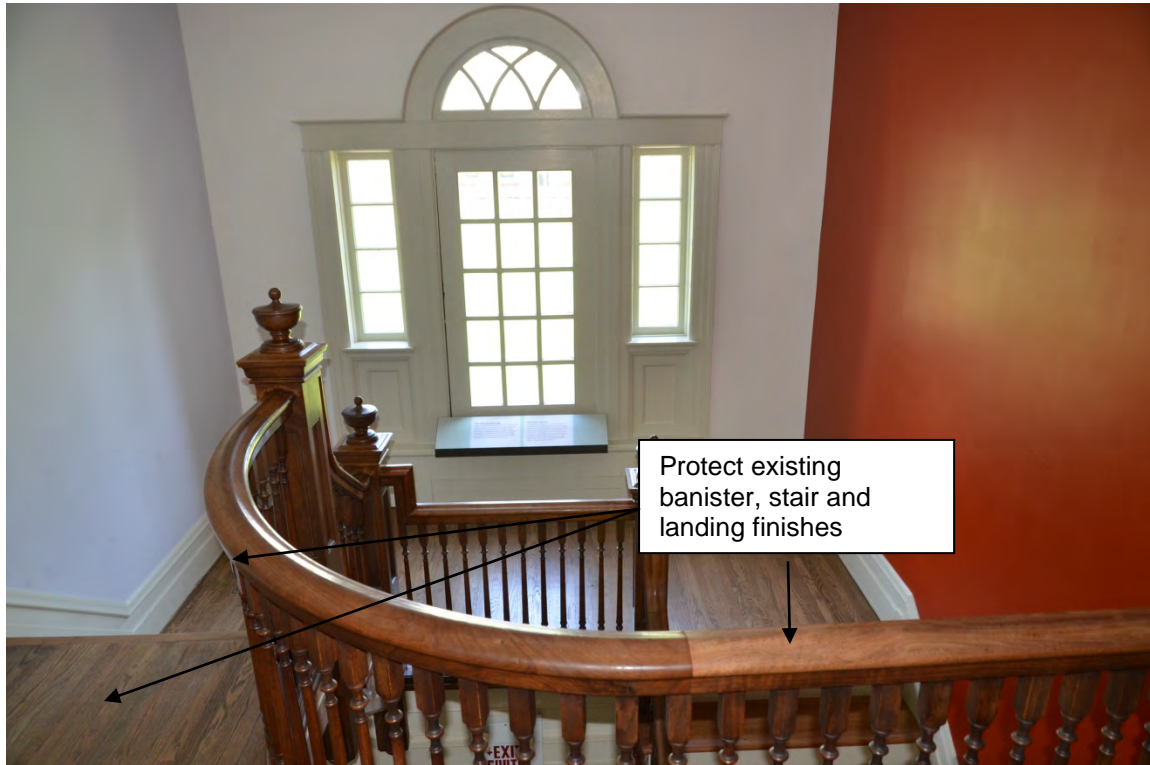


Figure 201 - Corridor CR201/Stair STR05

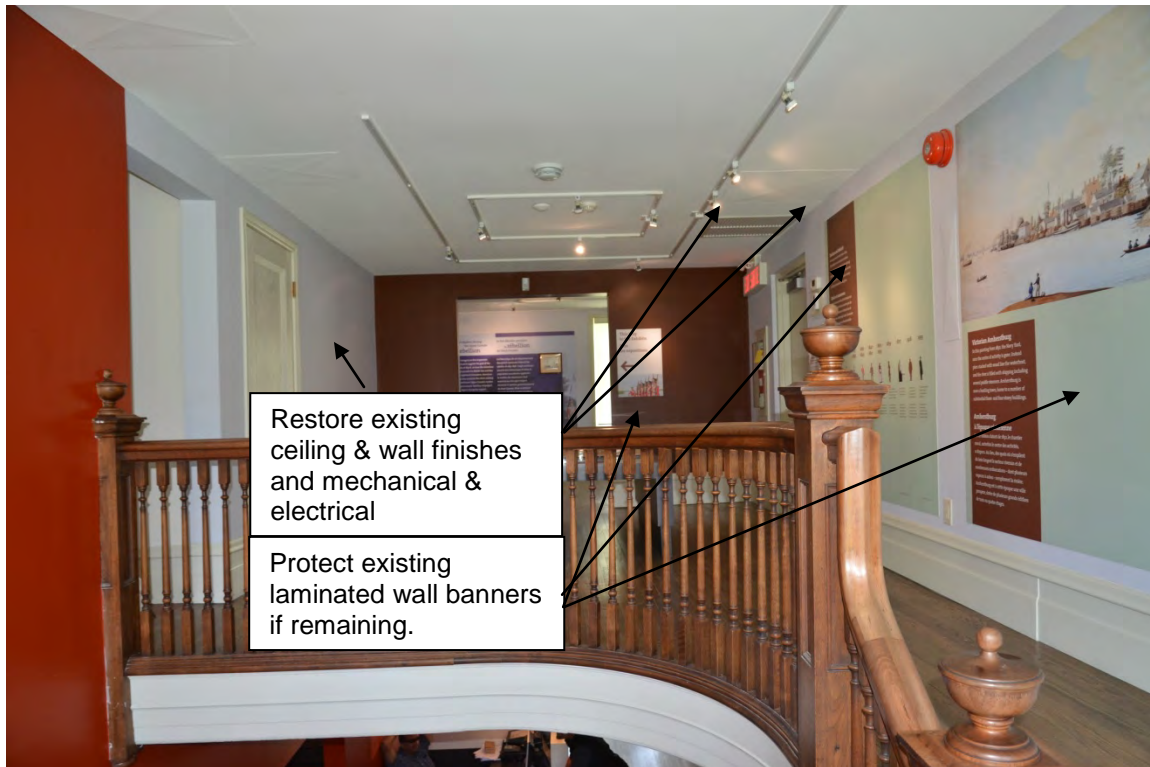


Figure 202 - Corridor CR201/Stair STR05

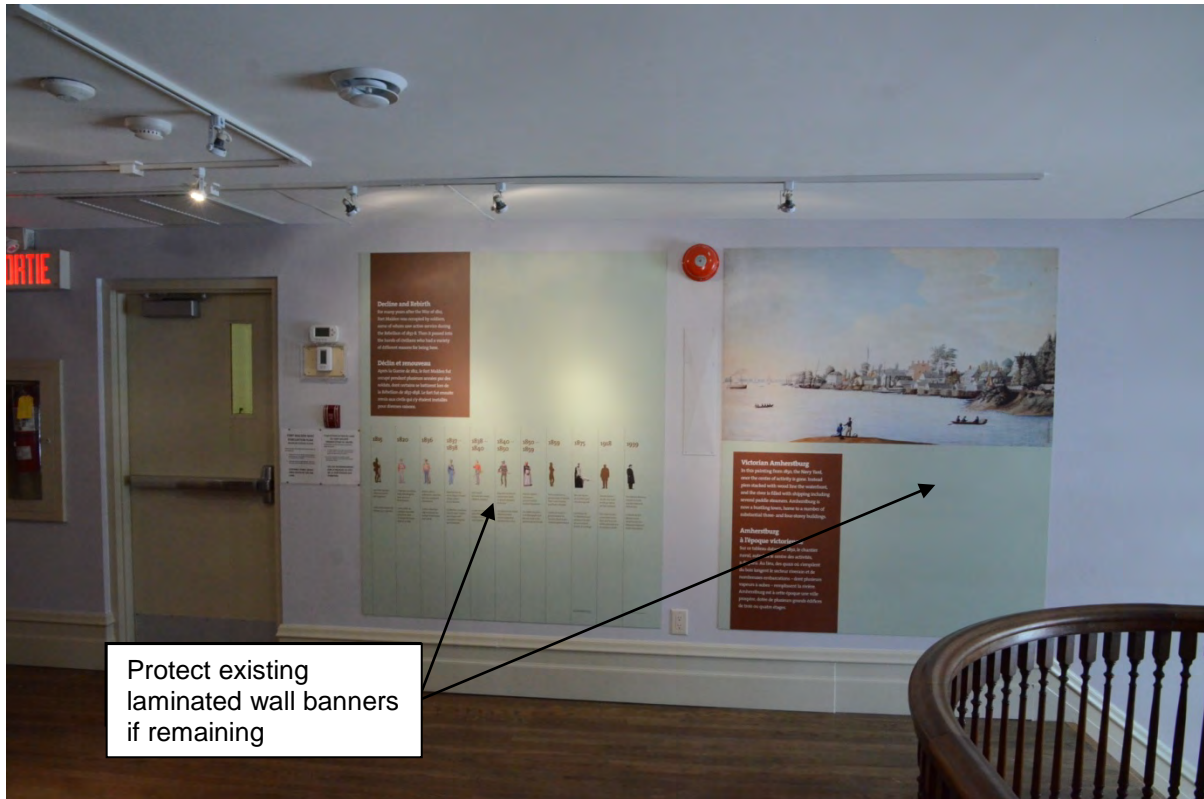


Figure 203 - Corridor CR201

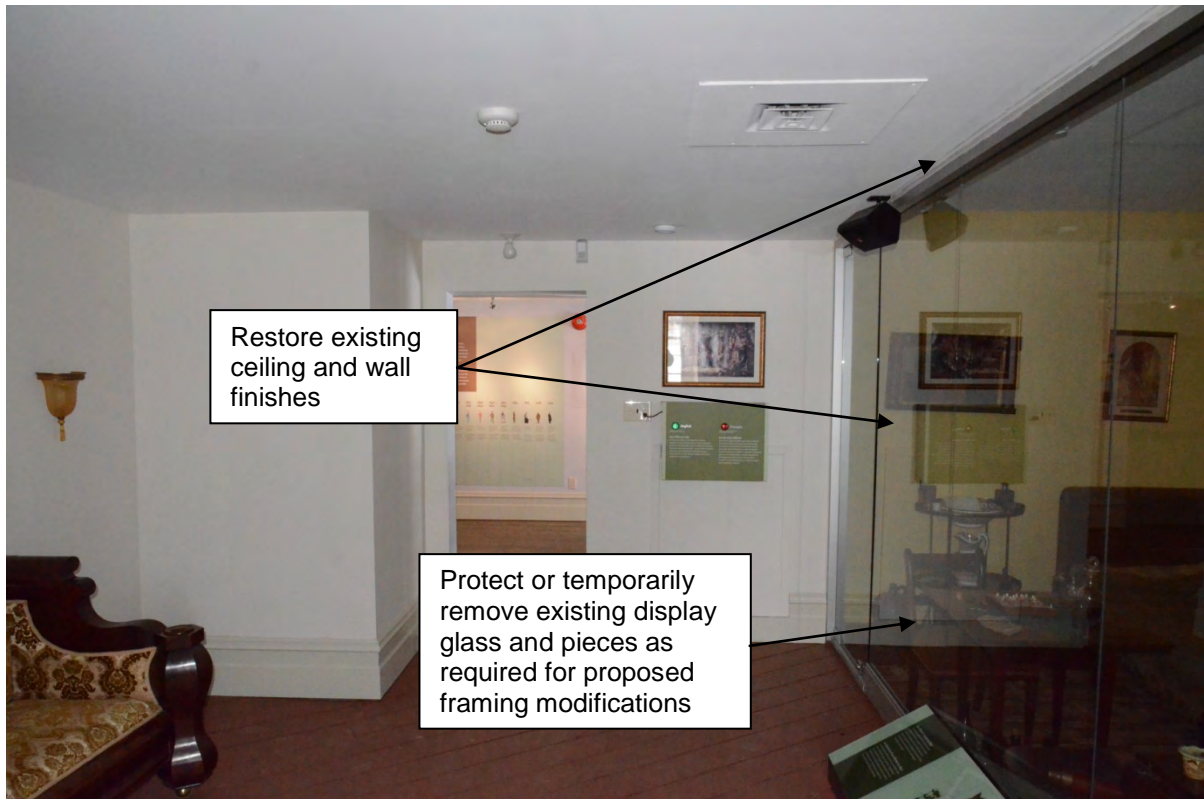


Figure 204 - Display Room 201



Figure 205 - Display Room 201



Figure 206 - Display Room 203



Figure 207 - Display Room 203



Figure 208 - Display Room 204

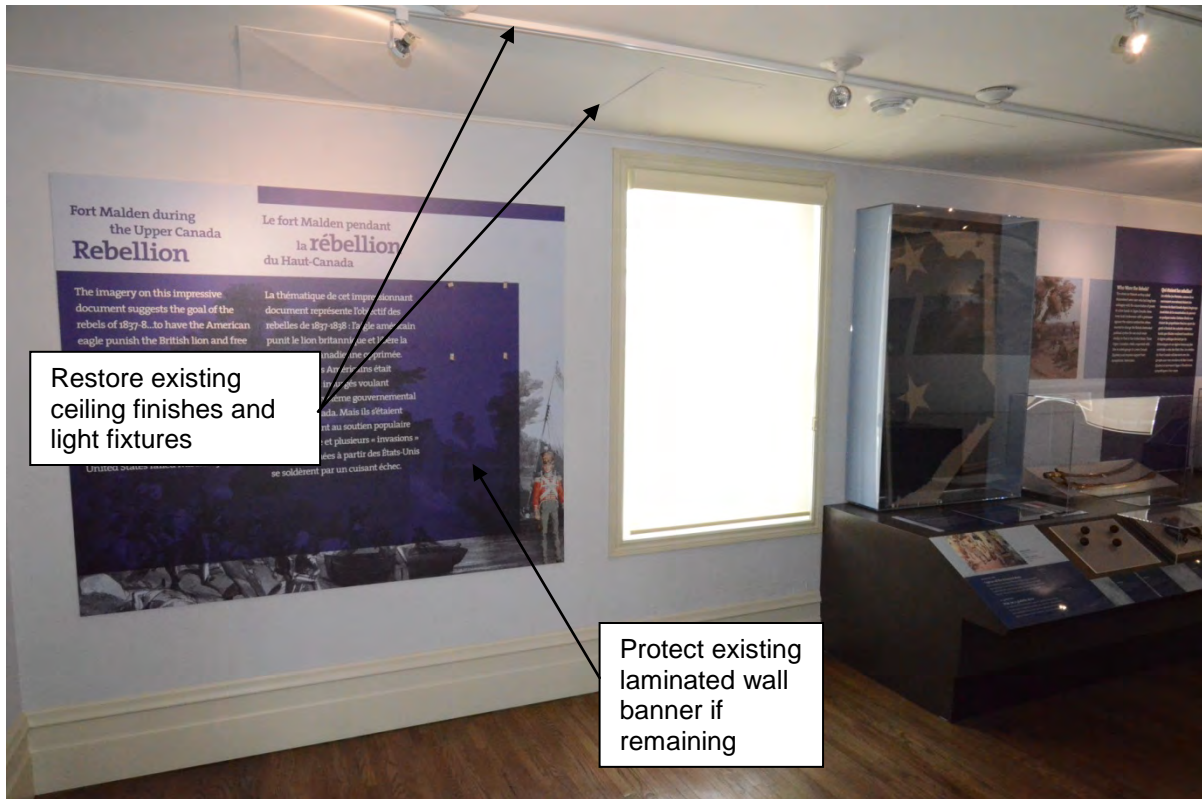


Figure 209 - Display Room 204

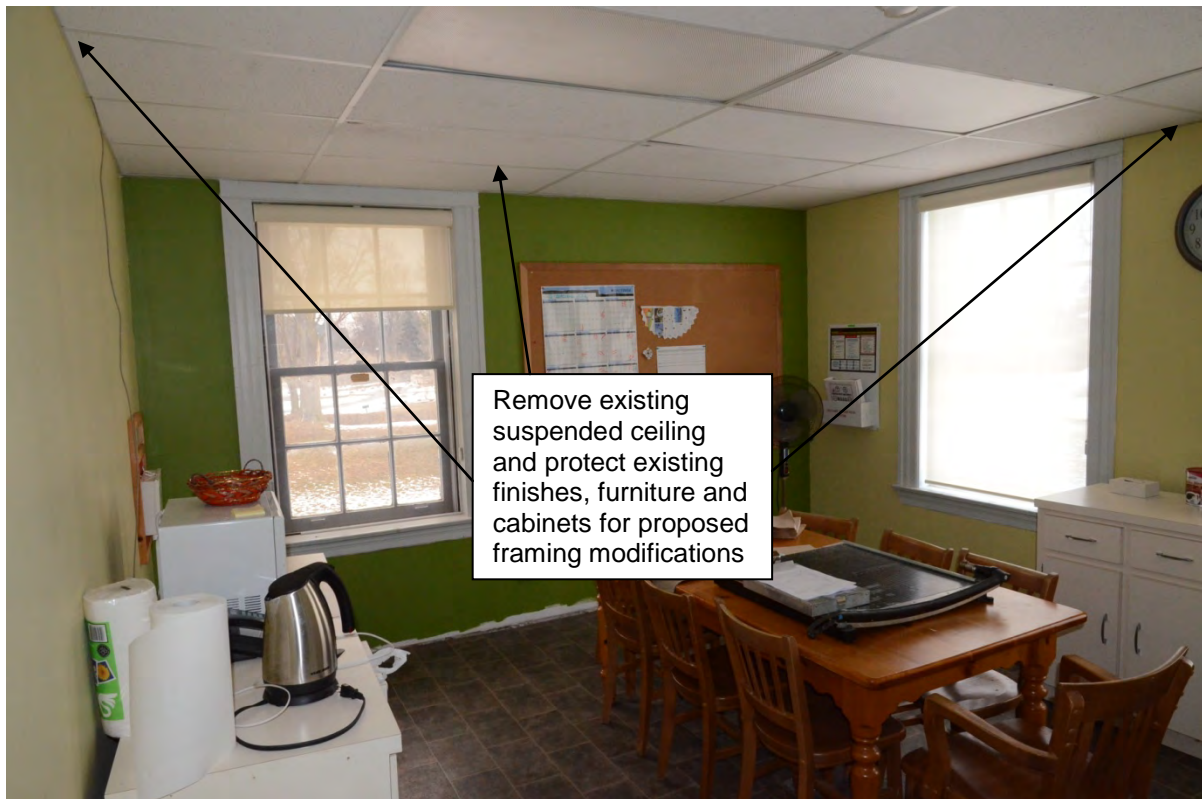


Figure 210 - Staff Room 206



Figure 211 - Staff Room 206

END OF SECOND FLOOR ELEVATIONS

THIRD FLOOR ELEVATIONS



Figure 301 - Office 303

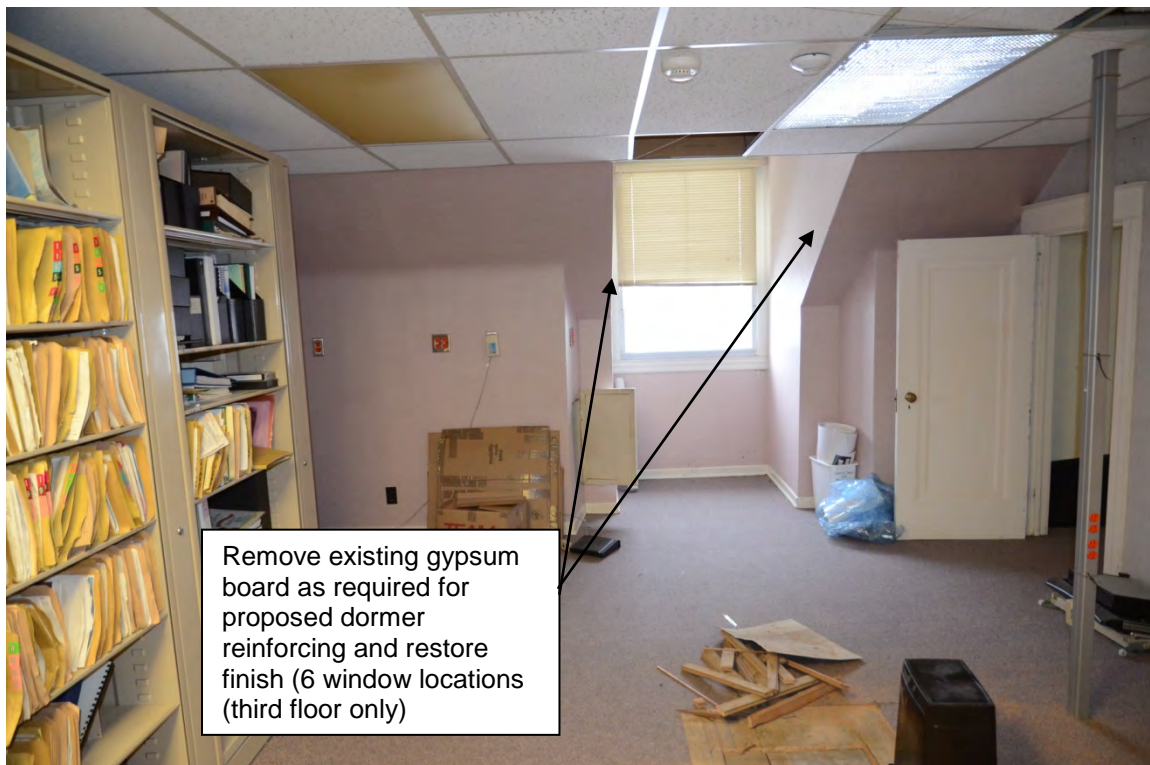


Figure 302 - Office PL



Temporary remove existing data equipment for proposed dormer reinforcing. (see electrical drawings).

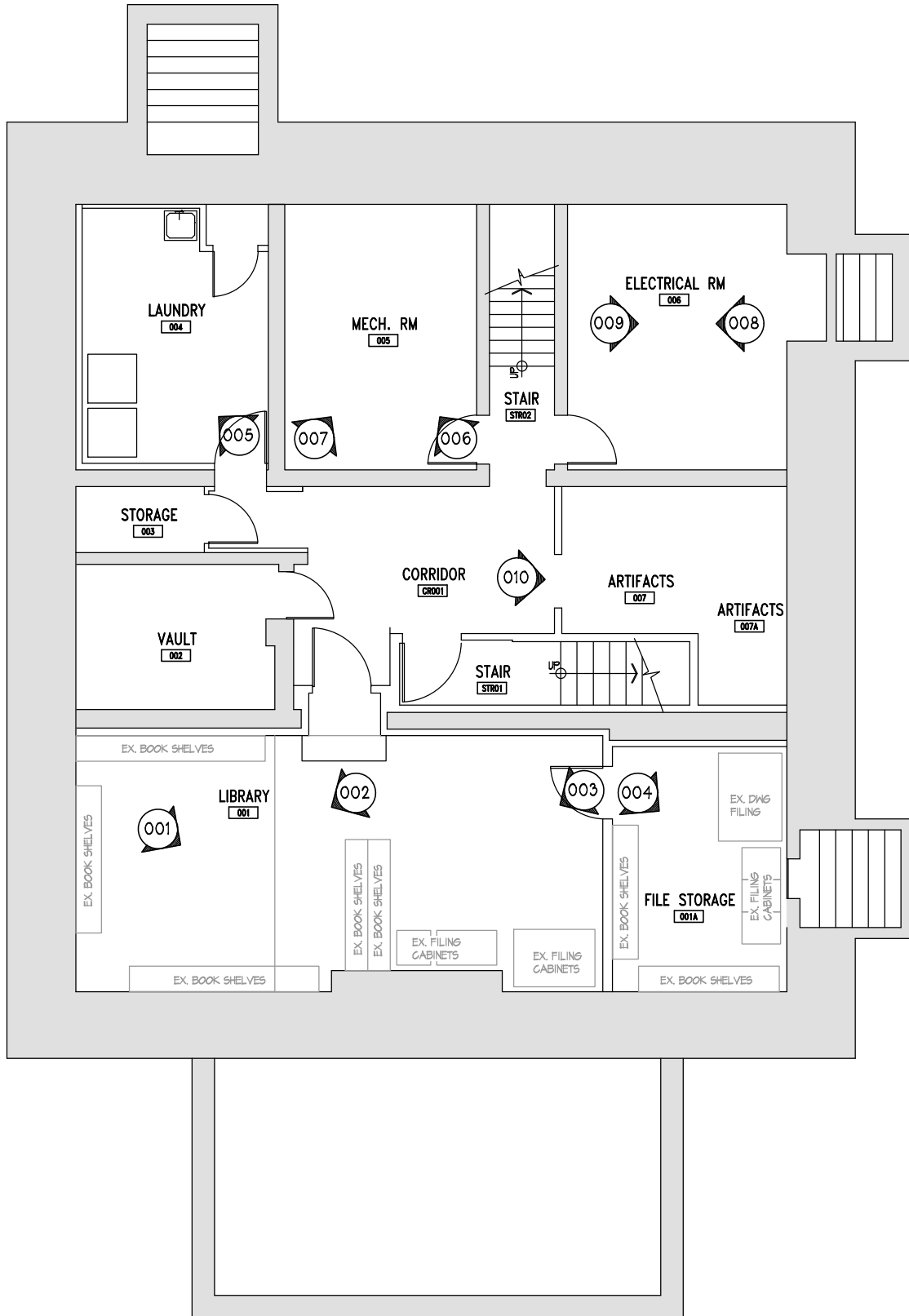
Figure 303 - Storage 302

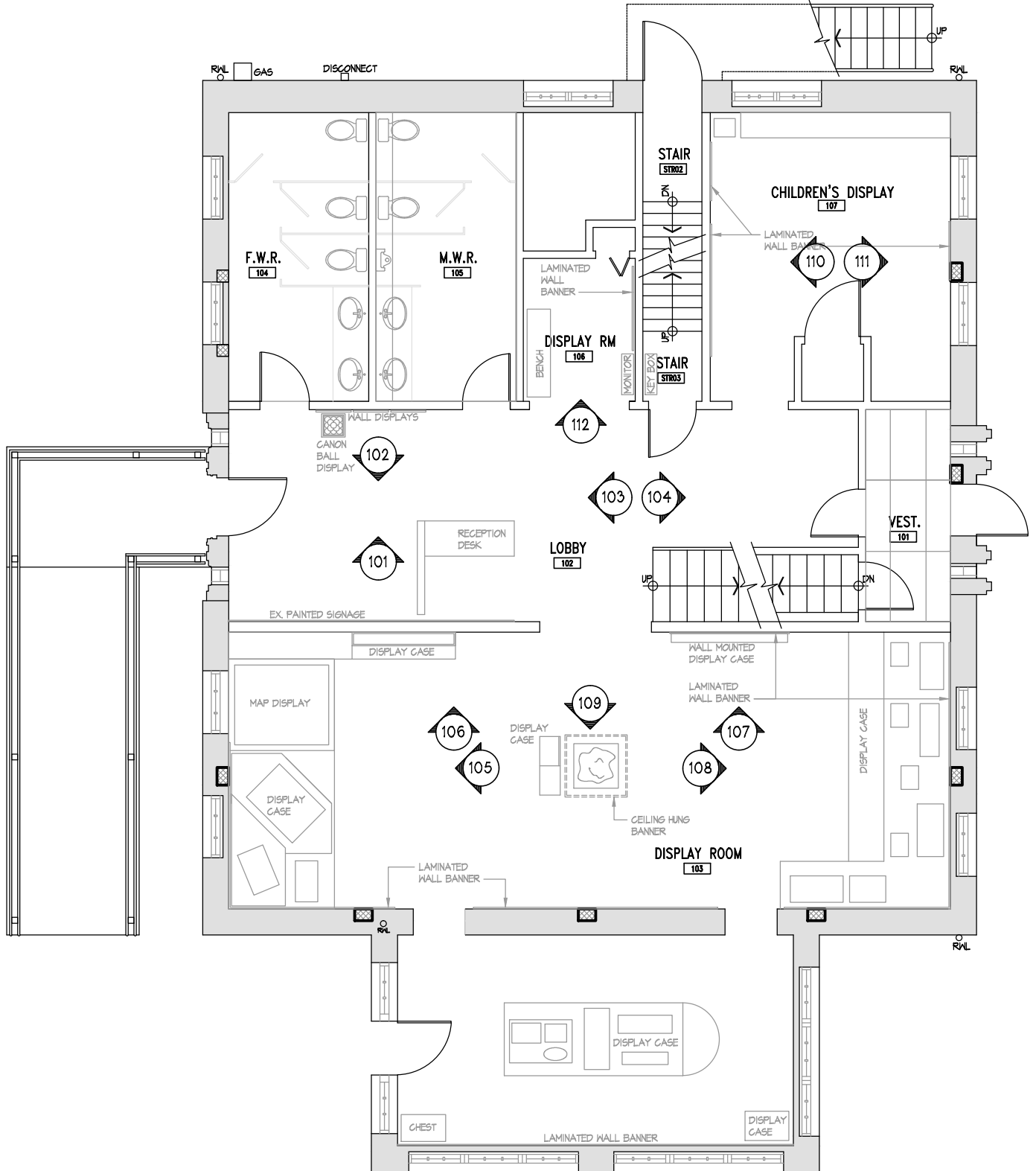


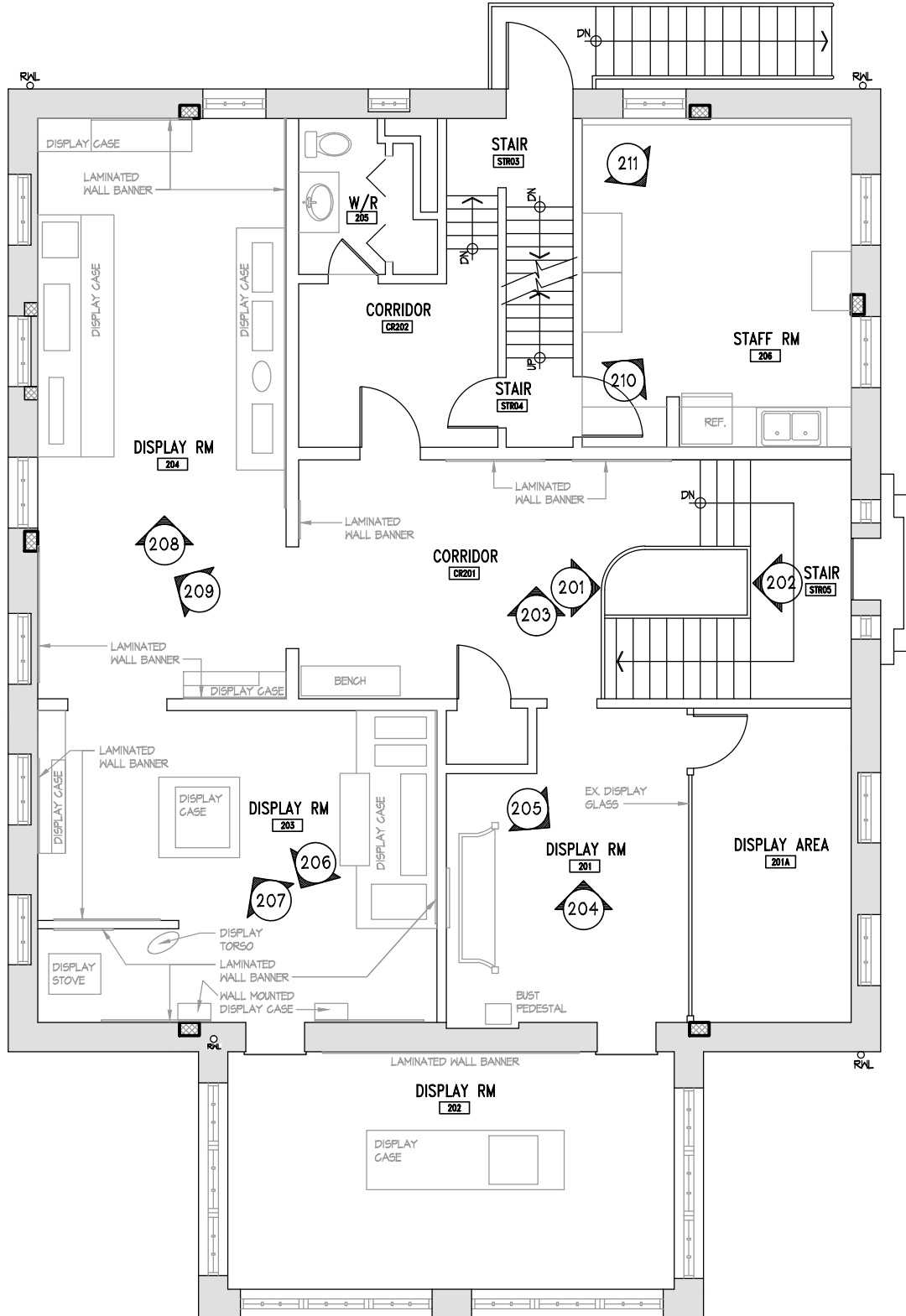
Restore existing access hatch with gypsum board. Prep & prime surface

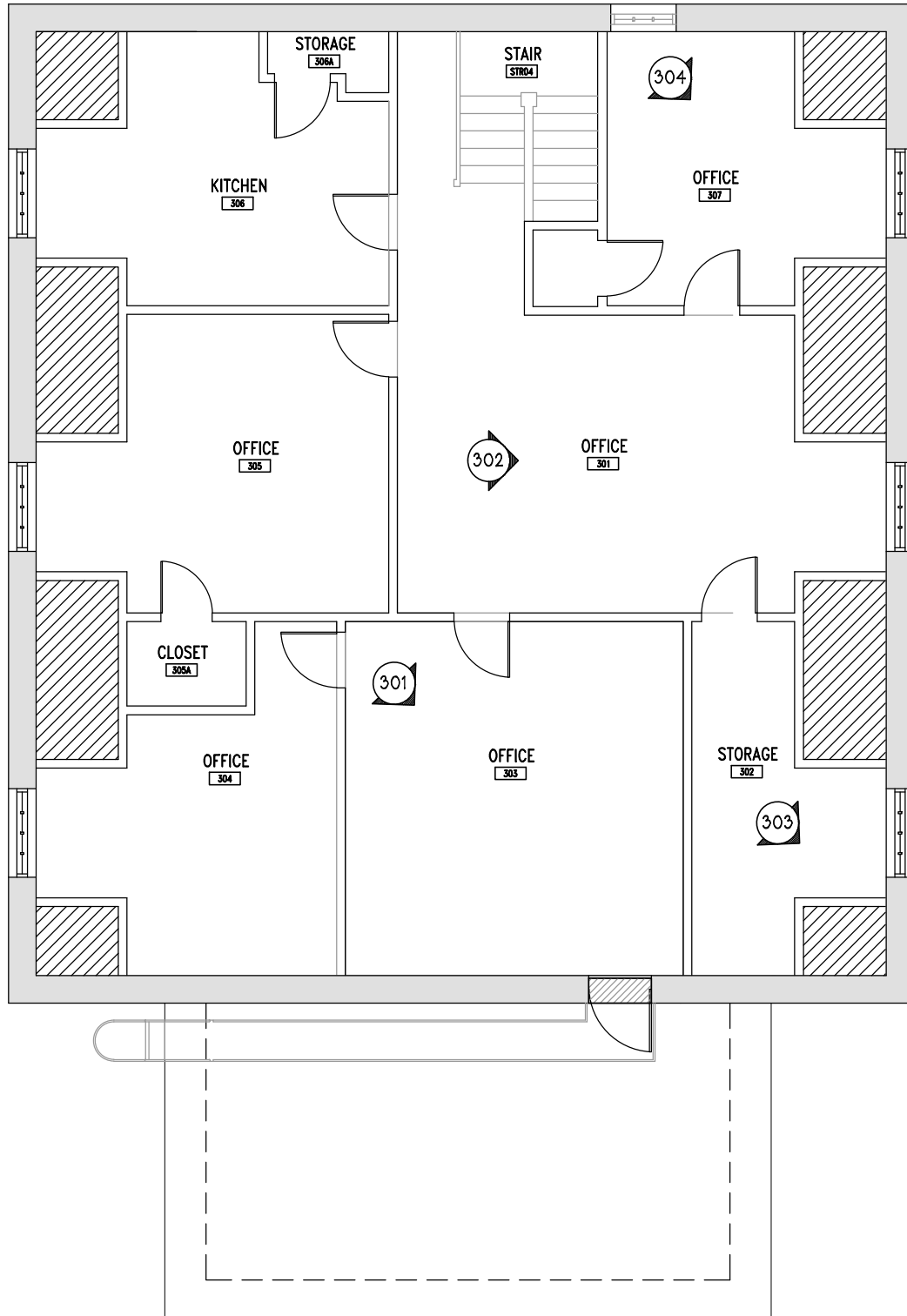
Figure 304 - Office 307

END OF THIRD FLOOR ELEVATIONS









PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.
- .3 Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.

1.2 ACCESS AND EGRESS

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

1.3 USE OF SITE AND FACILITIES

- .1 All work outside normal hours to be approved by Departmental Representative or Designate.
- .2 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated.
- .3 Maintain existing services to building and provide for personnel and vehicle access.
- .4 Where security is reduced by work provide temporary means to maintain security.
- .5 Contractor to provide temporary washroom facilities for their own forces and sub-trades.
- .6 Contractor will be permitted to use water from existing mains located outside building.
- .7 Contractor is permitted to use existing washroom on site for their sanitary facilities.
- .8 Provide additional sanitary facilities for workforce, as required, in accordance with governing regulations and ordinances. Locate in area approved by the Departmental Representative.
- .9 Maintain supply of paper towels and toilet paper and provide hand wash stations. Post notices and take precautions as required by local health authorities. Keep facilities in sanitary condition.
- .10 Closures: protect work temporarily until permanent enclosures are completed.
- .11 Parking, staging areas, storage as per drawings and to be coordinated with Departmental Representative upon award. Refer to Site Plan.

1.4 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.

1.5 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 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 around the Hough House during construction, provide barriers as required.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.6 SPECIAL REQUIREMENTS

- .1 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .2 Keep within limits of work and avenues of ingress and egress.
- .3 The site is of National significance, measures and methods of work on the site will need to be developed or in place during the work to protect the site from damage.

1.7 SECURITY CLEARANCES

- .1 Personnel employed on this project will be subject to security check. Obtain clearance, as instructed, for each individual who will require entry to premises.

1.8 BUILDING SMOKING ENVIRONMENT

- .1 Comply with smoking restrictions. Smoking is not allowed.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS SPECIFIED ELSEWHERE

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

1.2 APPOINTMENT AND PAYMENT

- .1 Departmental Representative will appoint and pay for services of testing laboratory except follows:
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Testing, adjustment and balancing of conveying systems, mechanical and electrical equipment and systems.
 - .4 Mill tests and certificates of compliance.
 - .5 Tests specified to be carried out by Contractor under the supervision of Departmental Representative.
- .2 Where tests or inspections by designated testing laboratory reveal Work not in accordance with contract requirements, pay costs for additional tests or inspections as required by Departmental Representative to verify acceptability of corrected work.

1.3 CONTRACTOR'S RESPONSIBILITIES

- .1 Provide labour, equipment, facilities and include within the estimate any additional cost to:
 - .1 Provide access to Work for inspection and testing.
 - .2 Facilitate inspections and tests.
 - .3 Make good Work disturbed by inspection and test.
 - .4 Provide storage on site for laboratory's exclusive use to store equipment and cure test samples.
- .2 Notify Departmental Representative 8 days in advance of operations to allow for assignment of laboratory personnel and scheduling of test.
- .3 Where materials are specified to be tested, deliver representative samples in required quantity to testing laboratory.
- .4 Pay costs for uncovering and making good Work that is covered before required inspection or testing is completed and approved by Departmental Representative.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 56 00 - Temporary Barriers and Enclosures.
- .3 Section 01 78 00 - Closeout Submittals.

1.2 ADMINISTRATIVE

- .1 Schedule and administer project meetings throughout progress of the work and 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 meeting minutes. Include significant proceedings and decisions. Identify actions by parties.
- .7 Reproduce and distribute copies of minutes within 4 days after meetings and transmit to meeting participants, affected parties not in attendance and Departmental Representative.
- .8 Representative of Contractor, Subcontractor and suppliers attending meetings will be qualified and authorized to act on behalf of party each represents.

1.3 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, and field inspectors 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 Environmental and Workplace Health and Safety representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.07 – 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.

1.4 PROGRESS MEETINGS

- .1 During course of Work and 2 weeks prior to project completion, schedule progress meetings every 2 weeks.
- .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
- .3 Notify parties minimum 4 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 8 days after meeting.
- .5 Agenda to include 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 affect on construction schedule and on completion date.
 - .12 Occupational health and safety.
 - .13 Other business.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 14 00 – Work Restrictions.
- .3 Section 01 33 00 - Submittal Procedures.
- .4 Section 01 56 00 - Temporary Barriers and Enclosures.

1.2 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, but exclusive of weekends and public holidays, 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.

1.3 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 Completion Certificate and Final Completion Certificate as defined times of completion are of essence of this contract.

1.4 SUBMITTALS

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

- .2 Submit to Departmental Representative within 5 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.

1.5 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.

1.6 PROJECT SCHEDULE

- .1 Develop detailed Project Schedule derived from Master Plan.
- .2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:
 - .1 Project Schedule with Contract Award Date.
 - .2 Award.
 - .3 Shop Drawings, Samples.
 - .4 Permits.
 - .5 Mobilization.
 - .6 Interior Demolition
 - .7 Exterior Demolition
 - .8 Heritage recordings.
 - .9 Foundation excavation.
 - .10 Backfill.
 - .11 Building footings.
 - .12 Exterior improvements.
 - .13 Masonry
 - .14 Millwork.
 - .15 Doors and windows.
 - .16 Interior Architecture (Walls, Floors and Ceiling).
 - .17 Plumbing.
 - .18 Piping.
 - .19 Heating, Ventilating, and Air Conditioning.
 - .20 Lighting.
 - .21 Electrical.
 - .22 Demobilization and site clean-up.

1.7 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.

1.8 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.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 78 00 - Closeout Submittals.

1.2 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.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.
- .2 Submit shop drawings bearing stamp and signature of qualified professional engineer registered or licensed in Province of 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 10 working 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 1 electronic copy 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 1 electronic copy 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 3 years of date of contract award for project.
- .13 Submit 1 electronic copy 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 1 electronic copy of manufacturer's 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 1 electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
- .16 Submit 1 electronic copy of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
- .17 Delete information not applicable to project.
- .18 Supplement standard information to provide details applicable to project.
- .19 If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, electronic 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.
- .20 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 Departmental Representative approves detail design inherent in shop drawings, responsibility for which shall remain with Contractor submitting same, and such review shall not relieve Contractor of responsibility for errors or omissions in shop drawings or of responsibility for meeting requirements of construction and Contract Documents.
 - .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.

1.4 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.

1.5 CERTIFICATES AND TRANSCRIPTS

- .1 Immediately after award of Contract, submit Workers' Compensation Board status.
 - .1 Note: The documents required before work can commence are outlined in the contract officer's acceptance letter, and are as follows;
 - .1 The required contract security must be delivered to the Department within 14 days of award.
 - .2 The required insurers certificate of insurance must be delivered to the Department within 30 days of award.

- .3 The required Attestation and Proof of Compliance with Occupational Health and Safety must also be completed and submitted to the Department before commencement of the work and within 30 days of award.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

- .1 Health and safety requirements to ensure that Parks Canada shows due diligence towards health and safety on construction sites.

1.2 RELATED SECTIONS

- .1 Section 01 11 00 - Summary of Work.
- .2 Section 01 33 00 – Submittal Procedures.
- .3 Section 02 81 01 - Hazardous Materials.

1.3 REFERENCES

- .1 Canada Labour Code, Part 2, Canada Occupational Safety and Health Regulations
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 Province of Ontario
 - .1 Occupational Health and Safety Act, R.S.O. 1990 Updated 2005.

1.4 SUBMITTALS

- .1 Make submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
- .3 Submit 6 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, 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 MSDS - Material Safety Data Sheets in accordance with Section 02 81 01 - Hazardous Materials.
- .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.
- .11 Complete and sign Parks Canada's attestation and Proof of Compliance with Occupational Health and Safety Form (attestation) after contract award and prior to commencement of any work under the contract. The contractor will be required to attend

a Health and Safety meeting administered by the contractor at which time the contractor will be required to complete and sign to attestation to certify the contractor will comply with the requirements set out in the attestation, terms and conditions of the contract.

1.5 FILING OF NOTICE

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

1.6 SAFETY ASSESSMENT

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

1.7 MEETINGS

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

1.8 REGULATORY REQUIREMENTS

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

1.9 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 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 Health and Safety Act, R.S.O.
- .2 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 Province 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 minimum 2 year's site-related working experience specific to activities associated with construction.
 - .2 Have working knowledge of occupational safety and health regulations.

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

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 Province 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 BLASTING

- .1 Blasting or other use of explosives is not permitted without prior receipt of written instruction by Departmental Representative.

1.17 POWDER ACTUATED DEVICES

- .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.

1.18 WORK STOPPAGE

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 11 – Cleaning.
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 REFERENCES

- .1 Definitions:
 - 1 Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade environment aesthetically, culturally and/or historically.
 - .2 Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants.
- .2 Reference Standards:
 - .1 U.S. Environmental Protection Agency (EPA)/Office of Water
 - .1 EPA 832/R-92-005-92, Storm Water Management for Construction Activities, Chapter 3.
 - .2 Parks Canada Environmental Management Directive (2009).

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prior to commencing construction activities or delivery of materials to site, provide Environmental Protection Plan for review by Departmental Representative.
- .3 Ensure Environmental Protection Plan includes comprehensive overview of known or potential environmental issues to be addressed during construction.
- .4 Address topics at level of detail commensurate with environmental issue and required construction tasks.
- .5 Include in Environmental Protection Plan:
 - .1 Names of persons responsible for ensuring adherence to Environmental Protection Plan.
 - .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan identifying type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3 requirements.
 - .6 Drawings showing locations of proposed temporary excavations or embankments for haul roads, material storage areas, structures, sanitary facilities, and stockpiles

- of excess or spoil materials including methods to control runoff and to contain materials on site.
- .7 Traffic Control Plans including measures to reduce erosion of temporary roadbeds by construction traffic, especially during wet weather. Ensure plans include measures to minimize amount of mud transported onto paved public roads by vehicles or runoff.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Ensure plan includes measures for marking limits of use areas and methods for protection of features to be preserved within authorized work areas.
 - .9 Spill Control Plan including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, are contained on project site.
 - .12 Contaminant Prevention Plan identifying potentially hazardous substances to be used on job site; intended actions to prevent introduction of such materials into air, water, or ground; and detailing provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
 - .13 Waste Water Management Plan identifying methods and procedures for management and/or discharge of waste waters which are directly derived from construction activities, such as concrete curing water, clean-up water, dewatering of ground water, disinfection water, hydrostatic test water, and water used in flushing of lines.
 - .14 Historical, archaeological, cultural resources biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.

1.4 FIRES

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

1.5 DRAINAGE

- .1 Provide Erosion and Sediment Control Plan identifying type and location of erosion and sediment controls provided. Ensure plan includes monitoring and reporting requirements to assure that control measures are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations, EPA 832/R-92-005, Chapter 3 requirements.
- .2 Storm Water Pollution Prevention Plan (SWPPP) to be substituted for erosion and sediment control plan.
- .3 Provide temporary drainage and pumping required to keep excavations and site free from water.
- .4 Ensure pumped water into waterways, sewer or drainage systems is free of suspended materials.
- .5 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.6 SITE CLEARING AND PLANT PROTECTION

- .1 Protect trees and plants on site not identified as requiring removal and adjacent properties as indicated.
- .2 Protect roots of designated trees to drip-line during excavation and site grading to prevent disturbance or damage. Avoid unnecessary traffic, dumping and storage of materials over root zones.
- .3 Minimize stripping of topsoil and vegetation.
- .4 Restrict tree removal to areas indicated or designated by Departmental Representative.

1.7 POLLUTION CONTROL

- .1 Maintain temporary erosion and pollution control features installed under this Contract.
- .2 Control emissions from equipment and plant to local authorities' emission requirements.
- .3 Prevent sandblasting and other extraneous materials from contaminating air and waterways beyond application area.
 - .1 Provide temporary enclosures where directed by Departmental Representative.
- .4 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

1.8 HISTORICAL/ARCHAEOLOGICAL CONTROL

- .1 Provide historical, archaeological, cultural resources, and biological resources that defines procedures for identifying and protecting historical, archaeological, cultural resources, and biological resources known to be on project site: and/or identifies procedures to be followed if historical archaeological and cultural resources, biological resources not previously known to be onsite or in area are discovered during construction.
- .2 Notify Departmental Representative immediately upon discovery of any archaeological resources/artefacts during excavation. Halt excavation while awaiting direction from the Departmental Representative.
- .3 Excavation work or part of excavation work may be monitored by Parks Canada Archaeological staff. Comply with request(s) made by Parks Canada to allow for archaeological observation/recording.
- .4 Due to the historic nature of the site the contractor should be prepared to conduct other work in the event of situations which may require heritage protection or mitigation.
- .5 Plan: include methods to assure protection of known or discovered resources and identify lines of communication between Contractor personnel and Departmental Representative.

1.9 NOTIFICATION

- .1 Departmental Representative will notify Contractor in writing of observed on compliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
 - .1 Do not take action until after receipt of written approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
- .4 No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 CLEANING

- .1 Clean in accordance with Section 01 74 11 - Cleaning.
- .2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .3 Remove all rubbish and waste material produced as a result of the work or related activities while on the site.
- .4 Ensure public waterways, storm and sanitary sewers remain free of waste and volatile materials disposal.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 35 43 - Environmental Procedures.
- .3 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 REFERENCES

- .1 Federal Legislation
 - .1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).
 - .2 Canadian Environmental Assessment Act, 1992, c. 37 (CEAA).
 - .3 Transportation of Dangerous Goods Act 1992, c. 34 (TDGA).
 - .4 Motor Vehicle Safety Act 1993, c. 16 (MVSA).
 - .5 Standards and Guidelines for Conservation of Historic Places, Second Edition

1.3 DEFINITIONS

- .1 Alternate Disposal: reuse and recycling of materials by designated facility, user or receiving organization which has valid Certificate of Approval to operate. Alternative to landfill disposal.
- .2 Deconstruction: systematic dismantling of structure to salvage materials for reuse. What cannot be reused is considered subsequently for recycling. Ultimate objective is to recover potentially valuable resources while diverting from landfill what has traditionally been significant portion of waste stream.
- .3 Demolition: rapid destruction of structure with or without prior removal of hazardous materials.
- .4 Disassembly: physical detachment of materials from structure and may include: prying, pulling, cutting, unscrewing.
- .5 Hauler: company (possessing appropriate and valid Certificate of Approval) contracted to transport waste, reusable or recyclable materials off site to designated facility, user or receiving organization.
- .6 Hazardous Materials: dangerous substances, dangerous goods, hazardous commodities and hazardous products, may include but not limited to: 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.
- .7 Processing: tasks which are subsequent to disassembly and may include: moving materials, denailing, cleaning, separating and stacking.
- .8 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse by others.
- .9 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .10 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .11 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse Includes:
 - .1 Salvaging reusable materials from remodelling projects before the demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items may include pallets and unused products to vendors.

- .12 Salvage: removal of structural and non-structural structure materials from industrial, commercial and institutional structure deconstruction/disassembly projects for purpose of reuse or recycling.
- .13 Source Separation: acts of keeping different types of waste materials separate beginning from first time they become waste.
- .14 Used Building Material Receipt: receipt issued at end destination for materials designated for alternate disposal.
- .15 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying (by volume or weight) amounts of materials and wastes generated during deconstruction. Indicates quantities of reuse, recycling and landfill.
- .16 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .17 Waste Reduction Workplan (WRW): written report which outlines actions to be taken to reduce, reuse and recycle materials during course of deconstruction. Actions based on finding of the Waste Audit (WA).
- .18 Weigh Bill: receipt received from recycling facility indicating weight and content of each load/bin of material.

1.4 SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 WMC is responsible for fulfillment of reporting requirements.
- .3 Prior to start of Work on site, submit detailed Waste Audit indicating descriptions of and anticipated quantities of materials to be reused, recycled and landfilled in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .4 Based on findings of Waste Audit submit Waste Reduction Workplan indicating schedule of selective demolition, material descriptions and quantities to be salvaged, number and location of bins, anticipated frequency of tippage, and names and addresses of haulers, facilities and receiving organizations in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- .5 Submit copies of certified weigh bills, bills of lading and used building material receipts from authorized disposal sites and reuse and recycling facilities for material removed from site to Departmental Representative on monthly basis.
 - .1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, and receiving organizations listed in Waste Reduction Workplan.
- .6 Workers, haulers and subcontractors must possess current, applicable permits to remove, handle and dispose of wastes categorized provincially as hazardous.
 - .1 Provide proof of compliance within 24 hours upon receipt of written request of Departmental Representative.
- .7 Keep copies of submittals on file for minimum of five years after completion of project.

1.5 DECONSTRUCTION DRAWINGS

- .1 Where required by authorities having jurisdiction, submit for approval drawings, diagrams and details showing sequence of deconstruction work, materials designated for salvage and support of structures and underpinning.
- .2 Submit drawings stamped and signed by qualified professional Engineer or Architect registered or licensed in Province of Ontario, Canada.

1.6 QUALITY CONTROL

- .1 Qualifications: provide adequate workforce training through meetings and demonstrations. Have someone on site with deconstruction experience throughout project for consultation and supervision purposes.
- .2 Regulatory Requirements: ensure Work is performed in compliance with CEPA, CEAA, TDGA, and MVSA, and applicable Provincial regulations.
- .3 Meetings: hold project meetings every month.
 - .1 Ensure key personnel, site supervisor and WMC to attend.
 - .2 WMC will provide written report on status of waste diversion and deconstruction activity at each meeting.
 - .3 Departmental Representative will provide written notification of any change to regular meeting schedule established upon contract award to Contractor 24 hours prior to scheduled meeting.

1.7 SITE CONDITIONS

- .1 Existing Conditions:
 - .1 Should materials resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of deconstruction, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.
 - .2 Structures to be deconstructed based on their condition at time of site visit during Bid period. Be responsible for provision of services required for deconstruction.
 - .3 Hazardous materials are known to be present on site. Refer to "Stockade Designated Substances & Hazardous Materials 2003 Report" attached at the end of the specifications.
- .2 Storage:
 - .1 Store materials salvaged for reuse and recycling in locations as directed by Departmental Representative.
 - .2 Maximum permitted duration of material storage on site determined in consultation with Departmental Representative after project completion.

1.8 ENVIRONMENTAL PROTECTION

- .1 Ensure Work is done in accordance with Section 01 35 43 - Environmental Procedures.
- .2 Ensure deconstruction work does not adversely affect adjacent watercourses, groundwater and wildlife, or contribute to excess air noise pollution.
- .3 Fires and burning of waste or materials is not permitted on site.
- .4 Do not bury waste or materials on site unless approved in writing by Departmental Representative.
- .5 Do not dispose of waste or volatile materials into watercourses, storm or sanitary sewers.
 - .1 Ensure proper disposal procedures in accordance with CEPA and TDGA applicable Provincial regulations.
- .6 Do not pump water containing suspended materials into watercourses, storm or sanitary sewers, or onto adjacent properties in accordance with authorities having jurisdiction.
- .7 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with authorities having jurisdiction and as directed by Departmental Representative.
- .8 Protect trees, plants and foliage on site and adjacent properties where indicated.
- .9 Prevent extraneous materials from contaminating air beyond deconstruction area, by providing temporary enclosures during Work.

- .10 Cover or wet down dry materials and waste to prevent blowing dust and debris. Control dust on temporary roads.
- .11 Employ reasonable means necessary to protect salvaged materials from vandalism, theft, adverse weather, or inadvertent damage by heavy machinery.
- .12 Use natural lighting to do Work where possible.
 - .1 Shut off lighting except those required for security purposes at end of each day.
- .13 Organize site and workers in manner which promotes efficient flow of materials through disassembly, processing, stockpiling, and removal.

1.9 SCHEDULING

- .1 Employ necessary means to meet project time lines without compromising specified minimum rates of material diversion. In event of unforeseen delay notify Departmental Representative in writing.
- .2 Where heritage artefacts, antiquities or cultural resources are discovered, halt Work in area immediately and notify Departmental Representative. Await directions from Departmental Representative on how to proceed.
- .3 Demolition Work, including interior, may be monitored by Departmental Representative or Parks Canada Cultural Resource staff. Comply with requests to allow for observation and recording. Work may be stopped at any time to allow for recording.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 SITE VERIFICATION OF CONDITIONS

- .1 Employ necessary means to assess site conditions and structures to determine quantity and locations of hazardous materials.
- .2 Investigate site and structure to determine dismantling, processing and storage logistics required prior to beginning of Work.
- .3 Develop strategy for deconstruction to facilitate optimum salvage of reusable and recyclable materials.

3.2 PREPARATION

- .1 Obtain necessary permits and approvals including Fire Marshall and demolition.
 - .1 Provide copies to Departmental Representative prior to start of Work on site.
- .2 Post signs in visible locations and appropriate languages which indicates to workers, subcontractors, haulers, and public, stockpiling of each material, and bin location and use e.g. ("CLEAN WOOD ONLY").

3.3 REMOVAL FROM SITE

- .1 Transport material designated for alternate disposal using approved haulers, facilities, and receiving organizations listed in Waste Reduction Workplan and in accordance with applicable regulations.

- .1 Written authorization from Departmental Representative is required to deviate from haulers, facilities, and receiving organizations listed in Waste Reduction Workplan.
- .2 Dispose of materials not designated for alternate disposal in accordance with applicable regulations.
 - .1 Disposal facilities must be those approved of and listed in Waste Reduction Workplan.
 - .2 Written authorization from Departmental Representative is required to deviate from disposal facilities listed in Waste Reduction Workplan.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 02 82 00.02 - Asbestos Abatement - Intermediate Precautions.

1.2 REFERENCES AND CODES

- .1 Perform Work in accordance with National Building Code (NBC) and Ontario Building Code (OBC) 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, Standards and Guidelines for Conservation of Historic Places, Second Edition (2003).
- .2 Meet or exceed requirements of:
 - .1 Contract documents.
 - .2 Specified standards, codes and referenced documents.

1.3 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 Department Representative or Delegate. Refer to Section 02 82 00.02 - Asbestos Abatement - Intermediate Precautions.
- .2 PCB: Polychlorinated Biphenyl: stop work immediately when material resembling Polychlorinated Biphenyl is encountered during demolition work. Notify Department Representative or Delegate.
- .3 Mould: stop work immediately when material resembling mould is encountered during demolition work. Notify Department Representative or Delegate.
- .4 Existing Conditions:
 - .1 Should materials resembling spray or trowel applied asbestos or other designated substance listed as hazardous be encountered in course of deconstruction, stop work, take preventative measures, and notify Departmental Representative immediately. Do not proceed until written instructions have been received.
 - .2 Structures to be deconstructed based on their condition at time of site visit during Bid period. Be responsible for provision of services required for deconstruction.
 - .3 Hazardous materials are known to be present on site. Refer to "Hazardous Building Materials Assessment Fort Malden Historic Site of Canada Hough House Report 91072 dated February 12, 2014 prepared by Pinchin Environmental Ltd." attached at the end of the specifications.

1.4 BUILDING SMOKING ENVIRONMENT

- .1 No smoking restrictions permitted on site.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

1.1 INSPECTION

- .1 Departmental Representative will engage, as required, independent inspection/ testing agencies for the purpose of quality assurance only, that is, verify contractor's quality control process for construction materials, workmanship, environmental protection, waste disposal, etc.
- .2 Contractor is responsible for quality control. Employment of inspection/ testing agencies does not relax responsibility to perform work in accordance with the contract documents.
- .3 Allow Departmental Representative or Delegate 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.
- .4 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative or Delegate instructions, or law of Place of Work.
- .5 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.
- .6 Departmental Representative or Delegate will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative or Delegate shall pay cost of examination and replacement.

1.2 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.

1.3 PROCEDURES

- .1 Notify appropriate agency and Departmental Representative or Delegate 10 days in advance of requirement for tests, in order that attendance arrangements can be made.
- .2 Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
- .3 Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

1.4 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 or Delegate as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
- .2 Make good other Contractor's work damaged by such removals or replacements promptly.

1.5 REPORTS

- .1 Submit 4 copies of inspection and test reports to Departmental Representative or Delegate.

- .2 Provide copies to subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

1.6 TESTS AND MIX DESIGNS

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

1.7 MOCK-UPS

- .1 Prepare mock-ups for Work specifically requested in specifications. Include for Work of Sections required to provide mock-ups.
- .2 Construct in locations acceptable to Departmental Representative or Delegate.
- .3 Prepare mock-ups for Departmental Representative or Delegate's review with reasonable promptness and in orderly sequence, to not cause delays in Work.
- .4 Failure to prepare mock-ups in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
- .5 If requested, Departmental Representative or Delegate will assist in preparing schedule fixing dates for preparation.
- .6 Mock-ups may remain as part of Work.
- .7 Specification section identifies whether mock-up may remain as part of Work or if it is to be removed and when.

1.8 MILL TESTS

- .1 Submit mill test certificates as required of specification Sections and as requested.

1.9 EQUIPMENT AND SYSTEMS

- .1 Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

- .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.
 - .2 Parks Canada Environmental Management Directive.
 - .3 Standards and Guidelines for Conservation of Historic Places, Second Edition.

1.3 SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

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

1.5 DEWATERING

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

1.6 WATER SUPPLY

- .1 The only water supply that will be available is after the Contractor has tied in to existing water main.

1.7 TEMPORARY HEATING AND VENTILATION

- .1 Provide temporary heating required during construction period, including attendance, maintenance and fuel.
- .2 Construction heaters used inside building must be vented to outside or be flameless type. Solid fuel salamanders are not permitted.
- .3 Provide temporary heat and ventilation in enclosed areas as required to:
 - .1 Facilitate progress of Work.
 - .2 Protect Work and products against dampness and cold.
 - .3 Prevent moisture condensation on surfaces.
 - .4 Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
 - .5 Provide adequate ventilation to meet health regulations for safe working environment.
- .4 Maintain temperatures of minimum 10 degrees C in areas where construction is in progress unless activities or products do not require 10 degrees C..
- .5 Ventilating:
 - .1 Prevent accumulations of dust, fumes, mists, vapours or gases in areas occupied during construction.
 - .2 Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
 - .3 Dispose of exhaust materials in manner that will not result in harmful exposure to persons.

- .4 Ventilate storage spaces containing hazardous or volatile materials.
- .5 Ventilate temporary sanitary facilities.
- .6 Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful contaminants.
- .6 Permanent heating system of building may be used. Make good any damage to system and return to as new condition upon completion.
- .7 Parks Canada Agency will pay for temporary heat, when using permanent heating system.
- .8 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
 - .1 Conform with applicable codes and standards.
 - .2 Enforce safe practices.
 - .3 Prevent abuse of services.
 - .4 Prevent damage to finishes.
 - .5 Vent direct-fired combustion units to outside.
- .9 Be responsible for damage to Work due to failure in providing adequate heat and protection during construction.

1.8 TEMPORARY POWER AND LIGHT

- .1 Provide temporary power during construction for temporary lighting and operating of power tools, to a maximum supply of 230 volts 30 amps.
- .2 Should there be additional power requirements, arrange for connection with appropriate utility company. Pay costs for installation, maintenance and removal.
- .3 Temporary power for equipment requiring in excess of above is responsibility of Contractor.
- .4 Provide and maintain temporary lighting throughout project. Ensure level of illumination on all floors is not less than 162 lx.
- .5 Electrical power and lighting systems installed under this Contract may be used for construction requirements only with prior approval of Department Representative or Delegate provided that guarantees are not affected. Make good damage to electrical system caused by use under this Contract. Replace lamps which have been used for more than 3 months.

1.9 FIRE PROTECTION

- .1 Maintain throughout performance of work the working function of fire protection equipment, including the fire alarm system monitoring the maintenance compound.
- .2 Burning rubbish and construction waste materials is not permitted on site.

1.10 SECURITY SYSTEM

- .1 Maintain throughout performance of work the working function of the security system monitoring the maintenance compound. Obtain written approval prior to conducting any activities that will cause disruption to the function of security alarm system. Limit Disruptions to 24 hours.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
 - .2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-A23.1/A23.2-04(R2009), 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(R2006), Signs and Symbols for the Occupational Environment.
- .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as of: May 14, 2004.
- .4 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.
 - .2 Standards and Guidelines for Conservation of Historic Places, Second Edition (2003)

1.3 SUBMITTALS

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

1.4 INSTALLATION AND REMOVAL

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

1.5 SCAFFOLDING

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

1.6 HOISTING

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

1.7 SITE STORAGE/LOADING

- .1 Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products.
- .2 Do not load or permit to load any part of Work with weight or force that will endanger Work.

1.8 CONSTRUCTION PARKING

- .1 Parking will be permitted on site within the limits of the fenced-off construction zone provided it does not disrupt performance of Work or cause unnecessary damage to the grounds or cause a disruption to the site operation.
- .2 Provide and maintain adequate access to project site.

1.9 SECURITY

- .1 Be responsible to arm the security system monitoring the existing visitor centre, the fort and the off-site maintenance compound at the end of each work day. Disarm at the start of each work day. Notify Departmental Representative at least 5 working days in advance of any activity that will cause an afterhours disruption to the security system to allow Parks Canada to make alternate security arrangements.

1.10 OFFICES

- .1 Use of the existing building is permitted.
- .2 Provide area heated to 22 degrees C, lighted 750 lx and ventilated, of sufficient size to accommodate site meetings and furnished with drawing laydown table.
- .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.

1.11 EQUIPMENT, TOOL AND MATERIALS STORAGE

- .1 Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials.
- .2 Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities.

1.12 SANITARY FACILITIES

- .1 Provide sanitary facilities for work force in accordance with governing regulations and ordinances.
- .2 Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition.

1.13 CONSTRUCTION SIGNAGE

- .1 No signs or advertisements, other than warning signs, are permitted on site.
- .2 Signs and notices for safety and instruction in English Graphic symbols to CAN/CSA-Z321.
- .3 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Department Representative or Delegate.

1.14 PROTECTION AND MAINTENANCE OF TRAFFIC

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

- .2 Maintain and protect traffic on affected roads during construction period except as otherwise specifically directed by the Department Representative or Delegate.
- .3 Provide measures for protection and diversion of traffic, including provision of watchpersons 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.
- .9 Provide snow removal during period of Work.

1.15 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.
- .5 Repair immediately the ground, if damaged by the contractors course of action including movement of vehicles and equipments.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 TEMPORARY EROSION AND SEDIMENTATION CONTROL

- .1 Provide temporary erosion and sedimentation control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction.
- .2 Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
- .3 Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

1.2 REFERENCES

- .1 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
 - .2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
- .2 Canadian Standards Association (CSA International)
 - .1 CSA-O121-M1978(R2008), Douglas Fir Plywood.
- .3 Public Works Government Services Canada (PWGSC) Standard Acquisition Clauses and Conditions (SACC)-ID: R0202D, Title: General Conditions 'C', In Effect as Of: May 14, 2004.

1.3 INSTALLATION AND REMOVAL

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

1.4 HOARDING

- .1 Provide temporary exterior construction fencing for entire perimeter of construction zone. Erect temporary site enclosure using 2440 mm high modular interlocking construction wired fencing system. Sandbags with standard fence panel metal feet are acceptable. Panel length 2400mm. Maintain fence in good repair. Provide minimum of one lockable pedestrian gate and two vehicle gates as directed. Equip gates with locks and keys. Provide one set of keys to be maintained on site until completion of the work. Relocate fencing as work progresses to the approval of the Departmental Representative. Reinstate site upon removal of temporary construction fencing

1.5 GUARD RAILS AND BARRICADES

- .1 Provide secure, rigid guard rails and barricades around deep excavations, open edges of floors and roofs.
- .2 Provide as required by governing authorities and as indicated.

1.6 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.

1.7 DUST TIGHT SCREENS

- .1 Provide dust tight screens or insulated 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.

1.8 ACCESS TO SITE

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

1.9 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 the Department Representative or Delegate 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 for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

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

1.2 QUALITY

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

1.3 AVAILABILITY

- .1 Immediately upon signing Contract, review product delivery requirements and anticipate foreseeable supply delays for items. If delays in supply of products are foreseeable, notify the Department Representative or Delegate 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 or Designate at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Department Representative or Delegate reserves right to substitute more readily available products of similar character, at no increase in Contract Price or Contract Time.

1.4 STORAGE, HANDLING AND PROTECTION

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

- .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
- .3 Store products subject to damage from weather in weatherproof enclosures.
- .4 Store cementitious products clear of earth or concrete floors, and away from walls.
- .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather. If winter, work with grouts, sand to be kept in heated area to prevent freezing.
- .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 or Designate
- .9 Touch-up damaged factory finished surfaces to Departmental Representative or Designate's satisfaction. Use touch-up materials to match original. Do not paint over name plates.

1.5 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 Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Department Representative or Delegate to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 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 Department Representative or Delegate if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Department Representative or Delegate 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 Department Representative or Delegate, whose decision is final.

1.7 CO-ORDINATION

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

1.8 CONCEALMENT

- .1 In finished areas conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.
- .2 Before installation inform Consultant if there is interference. Install as directed by Consultant.

1.9 REMEDIAL WORK

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

1.10 LOCATION OF FIXTURES

- .1 Consider location of fixtures, outlets, and mechanical and electrical items indicated as approximate.
- .2 Inform Department Representative or Delegate of conflicting installation. Install as directed.

1.11 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. Ensure proper stainless, 316, is used in contact with lime based mortar.
- .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.

1.12 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. 316 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.

1.13 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 Consultant.

1.14 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.
- .2 Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service.

PART 2 PRODUCTS

2.1 NOT USED

.1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

.1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 EXISTING SERVICES

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

1.2 LOCATION OF EQUIPMENT AND FIXTURES

- .1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate.
- .2 Locate equipment, fixtures and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access and maintenance.
- .3 Inform Department Representative or Delegate of impending installation and obtain approval for actual location.
- .4 Submit field drawings to indicate relative position of various services and equipment when required by Department Representative .

1.3 RECORDS

- .1 Maintain a complete, accurate log of control and survey work as it progresses.
- .2 Record locations of maintained, re-routed and abandoned service lines.

1.4 SUBMITTALS

- .1 Submit name and address of Surveyor to Departmental Representative or Designate.
- .2 On request of Departmental Representative or Designate, submit documentation to verify accuracy of field engineering work.
- .3 Submit certificate signed by surveyor certifying those elevations and locations of completed Work that conform with Contract Documents.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 01 74 21 - Construction/Demolition Waste Management And Disposal.
- .3 Section 07 84 00 - Firestopping.

1.2 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.

1.3 MATERIALS

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

1.4 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.

1.5 EXECUTION

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
- .2 Fit several parts together, to integrate with other Work.
- .3 Uncover Work to install ill-timed Work.
- .4 Remove and replace defective and non-conforming Work.
- .5 Remove samples of installed Work for testing.
- .6 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.

- .7 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
- .8 Employ original installer to perform cutting and patching for weather-exposed and moisture-resistant elements, and sight-exposed surfaces.
- .9 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
- .10 Restore work with new products in accordance with requirements of Contract Documents.
- .11 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- .12 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material in accordance with Section 07 84 00 - Firestopping, full thickness of construction element.
- .13 Refinish surfaces to match adjacent finishes: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .14 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 REFERENCES

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

1.3 PROJECT CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Owner or other Contractors.
- .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .3 Clear snow and ice from access to building, bank/pile snow in designated areas only.
- .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .5 Provide on-site containers for collection of waste materials and debris.
- .6 Provide and use marked separate bins for recycling. Refer to Section 01 74 21 - Construction/Demolition 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.

1.4 FINAL CLEANING

- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
- .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
- .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
- .4 Remove waste products and debris other than that caused by Owner or other Contractors.
- .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Consultant. Do not burn waste materials on site, unless approved by Consultant.
- .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
- .7 Clean and polish glass, mirrors, hardware, wall tile, stainless steel, chrome, porcelain enamel, baked enamel, plastic laminate, and mechanical and electrical fixtures. Replace broken, scratched or disfigured glass.

- .8 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors and building exterior.
- .9 Clean lighting reflectors, lenses, and other lighting surfaces.
- .10 Vacuum clean and dust building interiors, behind grilles, louvres and screens.
- .11 Wax, seal, shampoo or prepare floor finishes, as recommended by manufacturer.
- .12 Inspect finishes, fitments and equipment and ensure specified workmanship and operation.
- .13 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
- .14 Remove dirt and other disfiguration from exterior surfaces.
- .15 Clean and sweep roofs, gutters, areaways, and sunken wells.
- .16 Sweep and wash clean paved areas.
- .17 Clean equipment and fixtures to sanitary condition; clean or replace filters of mechanical equipment.
- .18 Clean roofs, downspouts, and drainage systems.
- .19 Remove debris and surplus materials from crawl areas and other accessible concealed spaces.
- .20 Remove snow and ice from access to building.

1.5 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.2 WASTE MANAGEMENT GOALS

- .1 Prior to start of Work conduct meeting with Consultant to review and discuss Parks Canada's Waste Management Plan and Goals.
- .2 Parks Canada's Waste Management Goal 75 percent of total Project Waste to be diverted from landfill sites. Provide Consultant documentation certifying that waste management, recycling, reuse of recyclable and reusable materials have been extensively practiced.
- .3 Accomplish maximum control of solid construction waste.
- .4 Preserve environment and prevent pollution and environment damage.

1.3 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.

1.4 DEFINITIONS

- .1 Class III: non-hazardous waste - construction renovation and demolition waste.
- .2 Cost/Revenue Analysis Workplan (CRAW): based on information from WRW, and intended as financial tracking tool for determining economic status of waste management practices.
- .3 Demolition Waste Audit (DWA): relates to actual waste generated from project.
- .4 Inert Fill: inert waste - exclusively asphalt and concrete.
- .5 Materials Source Separation Program (MSSP): consists of series of ongoing activities to separate reusable and recyclable waste material into material categories from other types of waste at point of generation.
- .6 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .7 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .8 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .9 Reuse: repeated use of product in same form but not necessarily for same purpose. Reuse includes:
 - .1 Salvaging reusable materials from re-modelling projects, before demolition stage, for resale, reuse on current project or for storage for use on future projects.
 - .2 Returning reusable items including pallets or unused products to vendors.
- .10 Salvage: removal of structural and non-structural materials from deconstruction/disassembly projects for purpose of reuse or recycling.
- .11 Separate Condition: refers to waste sorted into individual types.
- .12 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .13 Waste Audit (WA): detailed inventory of materials in building. Involves quantifying by volume/weight amounts of materials and wastes generated during construction, demolition, deconstruction, or renovation project. Indicates quantities of reuse, recycling and landfill. Refer to Schedule A.

- .14 Waste Management Co-ordinator (WMC) : contractor representative responsible for supervising waste management activities as well as coordinating related, required submittal and reporting requirements.
- .15 Waste Reduction Workplan (WRW): written report which addresses opportunities for reduction, reuse, or recycling of materials. Refer to Schedule B. WRW is based on information acquired from WA (Schedule A).

1.5 DOCUMENTS

- .1 Maintain at job site, one copy of following documents:
 - .1 Waste Audit.
 - .2 Waste Reduction Workplan.
 - .3 Material Source Separation Plan.
 - .4 Schedules A, B, C, D completed for project.

1.6 WASTE AUDIT (WA)

- .1 Conduct WA prior to project start-up.
- .2 Prepare WA: Schedule A.
- .3 Record, on WA - Schedule A, extent to which materials or products used consist of recycled or reused materials or products.

1.7 WASTE REDUCTION WORKPLAN (WRW)

- .1 Prepare WRW prior to project start-up.
- .2 WRW should include but not limited to:
 - .1 Destination of materials listed.
 - .2 Deconstruction/disassembly techniques and sequencing.
 - .3 Schedule for deconstruction/disassembly.
 - .4 Location.
 - .5 Security.
 - .6 Protection.
 - .7 Clear labelling of storage areas.
 - .8 Details on materials handling and removal procedures.
 - .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.
- .3 Structure WRW to prioritize actions and follow 3R's hierarchy, with Reduction as first priority, followed by Reuse, then Recycle.
- .4 Describe management of waste.
- .5 Identify opportunities for reduction, reuse, and recycling of materials. Based on information acquired from WA.
- .6 Post WRW or summary where workers at site are able to review content.
- .7 Set realistic goals for waste reduction, recognize existing barriers and develop strategies to overcome these barriers.
- .8 Monitor and report on waste reduction by documenting total volume and cost of actual waste removed from project.

1.8 DEMOLITION WASTE AUDIT (DWA)

- .1 Prepare DWA prior to project start-up.
- .2 Complete DWA: Schedule C.
- .3 Provide inventory of quantities of materials to be salvaged for reuse, recycling, or disposal.

1.9 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

- .1 Prepare CRAW: Schedule D.

1.10 MATERIALS SOURCE SEPARATION PROGRAM (MSSP)

- .1 Prepare MSSP and have ready for use prior to project start-up.
- .2 Implement MSSP for waste generated on project in compliance with approved methods and as reviewed by Consultant.
- .3 Provide on-site facilities for collection, handling, and storage of anticipated quantities of reusable and recyclable materials.
- .4 Provide containers to deposit reusable and recyclable materials.
- .5 Locate containers in locations, to facilitate deposit of materials without hindering daily operations.
- .6 Locate separated materials in areas which minimize material damage.
- .7 Collect, handle, store on-site, and transport off-site, salvaged materials in separate condition.
- .8 Transport to approved and authorized recycling facility.
- .9 Collect, handle, store on-site, and transport off-site, salvaged materials in combined condition.
- .10 Ship materials to site operating under Certificate of Approval.
- .11 Materials must be immediately separated into required categories for reuse or recycling.

1.11 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Consultant.
- .2 Unless specified otherwise, materials for removal become Contractor's property.
- .3 Separate non-salvageable materials from salvaged items. Transport and deliver non-salvageable items to licensed disposal facility.
- .4 Protect structural components not removed for demolition from movement or damage.
- .5 Support affected structures. If safety of building is endangered, cease operations and immediately notify Consultant.
- .6 Protect surface drainage, mechanical and electrical from damage and blockage.
- .7 Separate and store materials produced during dismantling of structures in designated areas.
- .8 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.

1.12 DISPOSAL OF WASTES

- .1 Do not bury rubbish or waste materials.
- .2 Do not dispose of waste, volatile materials, mineral spirits, oil, or paint thinner into waterways, storm, or sanitary sewers.
- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.

- .6 Remove materials from deconstruction as deconstruction/disassembly Work progresses.
- .7 Prepare project summary to verify destination and quantities on a material-by-material basis as identified in pre-demolition material audit.

1.13 USE OF SITE AND FACILITIES

- .1 Execute work with least possible interference or disturbance to normal use of premises.
- .2 Provide temporary security measures approved by Consultant.

1.14 SCHEDULING

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

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 APPLICATION

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

3.2 CLEANING

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

3.3 DIVERSION OF MATERIALS

- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Consultant, and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
- .2 On-site sale of salvaged, recovered, reusable, or recyclable materials is not permitted.
- .3 Demolition Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Acoustic Tile	50	[]
Acoustical Insulation	100	[]
Carpet	100	[]
De-mountable Partitions	80	[]
Doors and Frames	100	[]
Electrical Equipment	80	[]
Furnishings	80	[]

Mechanical Equipment	100	<input type="text"/>
Metals	100	<input type="text"/>
Rubble	100	<input type="text"/>
Wood (uncontaminated)	100	<input type="text"/>
Other		<input type="text"/>

.4 Construction Waste:

Material Type	Recommended Diversion %	Actual Diversion %
Cardboard	100	<input type="text"/>
Plastic Packaging	100	<input type="text"/>
Rubble	100	<input type="text"/>
Steel	100	<input type="text"/>
Wood (uncontaminated)	100	<input type="text"/>
Other		<input type="text"/>

3.4 WASTE AUDIT (WA)

.1 Schedule A - Waste Audit (WA):

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Wood and Plastics Material Description Off-cuts Warped Pallet Forms Plastic Packaging						

(1) Material Category	(2) Material Quantity Unit	(3) Estimated Waste %	(4) Total Quantity of Waste (unit)	(5) Generation Point	(6) % Recycled	(7) % Reused
Cardboard Packaging Other Doors and Windows Material Description Painted Frames Glass Wood Metal						

Other						
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3.5 WASTE REDUCTION WORKPLAN (WRW)

.1 Schedule B:

(1) Material Category	(2) Person Responsible	(3) Total Quantity of Waste (unit)	(4) Reused Amount (units) Projected	Actual	(5) Recycled Amount (unit) Projected	Actual	(6) Materials Destination
Wood and Plastics Material Description Chutes Warped Pallet Forms Plastic Packaging Cardboard Packaging Other Doors and Windows Material Description Painted							

3.6 DEMOLITION WASTE AUDIT (DWA)

.1 Schedule C - Demolition Waste Audit (DWA):

(1) Material Description	(2) Quantity	(3) Unit	(4) Total	(5) Volume (cum)	(6) Weight (cum)	(7) Remarks and Assumptions
Wood Wood Stud Plywood Baseboard- Wood Door Trim - Wood Cabinet Doors and						

Windows Panel Regular Slab Regular Wood Laminate Byfold - Closet Glazing						
---	--	--	--	--	--	--

3.7 COST/REVENUE ANALYSIS WORKPLAN (CRAW)

.1 Schedule D - Cost/Revenue Analysis Workplan (CRAW):

(1) Material Description	(2) Total Quantity (cum)	(3) Volume Quantity (cum)	(4) Weight (cum)	(5) Disposal Cost/Credit \$(+/-)	(5) Category Sub-Total (\$)+/-	(7) Cost (-) / Revenue (+)
Wood Wood Stud Plywood Baseboard - Wood Door Trim - Wood Cabinet \$ Doors and Windows Panel Regular Slab Regular Wood Laminate Byfold - Closet Glazing						

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 74 11 – Cleaning.
- .2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.2 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 or Delegate in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.
 - .2 Request Departmental Representative or Designate inspection.
 - .2 Site Inspections:
 - .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 balanced and fully operational.
 - .4 Certificates required by Fire Commissioner and Utility companies submitted.
 - .5 Operation of systems: demonstrated to Owner's personnel.
- .4 Final Inspection:
 - .1 When completion tasks are done, request final inspection of Work by Departmental Representative, and Contractor.
 - .2 When Work incomplete according to Consultant, complete outstanding items and request re-inspection.

1.3 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 for reuse and recycling in accordance with applicable standards.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- .1 Section 01 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.

1.2 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-warranty Meeting:
 - .1 Convene meeting one week prior to contract completion with contractor's representative and Consultant, in accordance with Section 01 31 19 – Project Meetings to:
 - .1 Verify Project requirements.
 - .2 Review manufacturer's installation instructions and warranty requirements.
 - .2 Consultant 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.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, four 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.

1.4 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 systems, under Section numbers and sequence of 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 DVD.

1.5 CONTENTS - PROJECT RECORD DOCUMENTS

- .1 Table of Contents for Each Volume: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
- .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
- .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
- .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
- .5 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.
- .6 Training: refer to Section 01 79 00 - Demonstration and Training.

1.6 AS -BUILT DOCUMENTS AND SAMPLES

- .1 Maintain, in addition to requirements in General Conditions, at site for Consultant 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 Consultant.

1.7 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

- .1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Consultant.
- .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 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.
- .4 Field changes of dimension and detail.
- .5 Changes made by change orders.
- .6 Details not on original Contract Drawings.
- .7 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, and field test records, required by individual specifications sections.
- .7 Provide digital photos, if requested, for site records.

1.8 MATERIALS AND FINISHES

- .1 Building products, applied materials, and finishes: include product data, with catalogue number, size, composition, and colour and texture designations.
- .2 Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .3 Moisture-protection and weather-exposed products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
- .4 Additional requirements: as specified in individual specifications sections.

1.9 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 Consultant.
 - .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 Consultant.
 - .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 Consultant.

- .2 Include approved listings in Maintenance Manual.

1.10 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 Consultant.

1.11 WARRANTIES AND BONDS

- .1 Develop warranty management plan to contain information relevant to Warranties.
- .2 Submit warranty management plan, 30 days before planned pre-warranty conference, to Consultant approval.
- .3 Warranty management plan to include required actions and documents to assure that Consultant 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 Consultant 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.
- .7 Retain warranties and bonds until time specified for submittal.
- .8 Except for items put into use with Owner's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .9 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Consultant.
- .10 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, HVAC balancing, pumps, motors, transformers, and commissioned systems such as fire protection, and alarm systems.
 - .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.
- .4 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.
- .5 Procedure and status of tagging of equipment covered by extended warranties.
- .6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification to follow oral instructions.
 - .1 Failure to respond will be cause for the Consultant to proceed with action against Contractor.

1.12 WARRANTY TAGS

- .1 Tag, at time of installation, each warranted item. Provide durable, oil and water resistant tag approved by Consultant.
- .2 Attach tags with copper wire and spray with waterproof silicone coating.
- .3 Leave date of acceptance until project is accepted for occupancy.
- .4 Indicate following information on tag:
 - .1 Type of product/material.
 - .2 Model number.
 - .3 Serial number.
 - .4 Contract number.
 - .5 Warranty period.
 - .6 Inspector's signature.
 - .7 Construction Contractor.

PART 2 PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 EXECUTION

3.1 NOT USED

- .1 Not Used.

END OF SECTION

PART 1 - GENERAL

- 1.1 Related Work
 - .1 Concrete Forming and Accessories: Section 03 10 00.
 - .2 Cast-in-place concrete: Section 03 30 00.
- 1.2 Reference Standards
 - .1 CSA-A23.1 - Concrete Materials and Methods of Concrete Construction
 - .2 CSA W186, Welding of Reinforcing Bars in Reinforced Concrete Construction.
 - .3 CSA G 30.5 - Welded Steel Wire Fabric for Concrete Reinforcement
 - .4 CSA G 30.1 2 - Billet Steel Bars for Concrete Reinforcement
 - .5 OPSS9 - Ontario Provincial Standard Specification Construction Specification for Steel Reinforcement for Concrete
- 1.3 Submittals
 - .1 Test Reports: Submit certification from reinforcing steel manufacturer confirming compliance of supplied products to specified CAN/CSA Standards as specified.
- 1.4 Delivery, Storage and Handling
 - .1 Store materials on site in a manner to prevent damage thereto. Protect from the weather. Comply with CSA-A23.1.
 - .2 Protect work of this Section from damage. Protect other work from damage resulting from this work. Replace damaged work which cannot be satisfactorily repaired.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Reinforcing Steel: Conforming to CSA G 30.1 2, Grade 400.
 - .2 Mesh Reinforcement: CSA G 30.5, flat sheets (roll not acceptable)
 - .3 Chairs and Spacers: As manufactured by Drummond and Reeves Ltd., Acrow Richmond or Superior Concrete Accessories Ltd. of sufficient strength to rigidly support weight of reinforcement and construction loads. Use non-corrosive type at structural supported slab.
 - .4 Furnish epoxy coated dowels and rebar in porches and steps. Furnish epoxy coated pins for anchorage to existing adjacent structures as shown.
 - .5 Epoxy Grout: Furnish epoxy grout as manufactured by Sika Canada Inc. of type as recommended by the manufacturer for purpose as shown.
- 2.2 Fabrication
 - .1 Fabricate reinforcing steel per reviewed shop drawings.
 - .2 Bend steel cold; no heating will be permitted. Bends shall be of not less than 6 bar diameters.
 - .3 Fabrication tolerances for reinforcing steel to "Reinforcing Steel Manual of Standard Practice" metric supplement (latest edition) by Reinforcing Steel Institute of Canada.
 - .4 Obtain Departmental Representative or Designate's approval for locations of reinforcement splices other than shown on steel placing drawings.
 - .5 Ship bundles of bar reinforcement, clearly identified in accordance with reviewed bar

lists.

PART 3 - EXECUTION

3.1 Examination

- .1 Inspect existing conditions upon which work of this Section is dependent. Notify Departmental Representative or Designate in writing of any conditions which may prejudice a proper installation. Commencement of work implies acceptance of existing conditions.
- .2 Inspect formwork to ensure that it has been completed and adequately braced in place before commencing to place reinforcement.

3.2 Field Bending

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

3.3 Placing Reinforcing Steel

- .1 Place reinforcing steel and mesh reinforcing in accordance with reviewed placing drawing. Support with chairs or spacers in as close spacing as possible to prevent displacement of reinforcement from intended bar position, before and during pouring of concrete. Pieces of block, wood, etc. are not acceptable as chairs and spacers.
- .2 Straighten kinks and bends not called for on Drawings.
- .3 Provide bars in lengths as long as possible. Where bars are joined, lap at least the distance required by CSA-A23.1 unless shown otherwise.
- .4 Lap wire mesh sections at least 150mm (6") and wire together securely.
- .5 Obtain Departmental Representative or Designate's approval of reinforcing steel and position before placing concrete.
- .6 Clean reinforcing before placing concrete.
- .7 Keep reinforcing 100mm back from edges and non-doweled joints.
- .8 Drill for and install pins, dowels and anchors as shown of Drawings.
- .9 Refer to Structural Notes on Drawings for additional requirements, i.e. reinforcing bar laps, concrete coverage over reinforcing in various structures, etc.

- END OF SECTION -

PART 1 - GENERAL

- 1.1 Related Work
 - .1 Concrete Reinforcement Section 03 20 00.
 - .2 Excavating, trenching and Backfilling Section 31 23 10.
- 1.2 References
 - .1 ASTM C260 - Specification for Air-Entraining Admixtures for Concrete
 - .2 ASTM C494 - Specification for chemical Admixtures for Concrete
 - .3 CSA-A5 - Portland Cements
 - .4 CSA-A23.1 - Concrete Materials and Methods of Concrete Construction
 - .5 CSA A23.2 - Methods of Test for Concrete
 - .6 CSA-A266.4 - Guidelines for Use of Admixtures in Concrete
 - .7 CSA-G40.20-M - General Requirements for Rolled or Welded Structural Quality Steel
- 1.3 Storage and General Protection
 - .1 Store materials on site in a manner to prevent damage thereto. Protect from the weather. Comply with the requirements of CSA-A23.1
- 1.4 Environmental Conditions
 - .1 Conform to all requirements of CSA-A23.1
 - .2 During cold weather, provide all temporary heating and enclosures required. Mix, place and protect concrete in accordance with CSA-A23.1.
- 1.5 Tolerances
 - .1 Concrete in place shall be plumb, level and true to linear building lines. Maximum variations (not accumulative) as follows:
 - .1 Variation from plumb in concrete surfaces shall not exceed 1/4" in 10'-0", nor 3/8" in 20'-0" or more.
 - .2 Variation from level or grade indicated on Drawings for tops of walls shall not exceed 1/4" in 10'-0", nor 3/8" in any one bay.
 - .3 Variation from linear building lines from established position in plan and related positions of walls shall not exceed 1/4" in 10'-0" in, 3/8" in one bay nor 1" in building length.
- 1.6 Records
 - .1 Keep a written record of concrete pours, showing location, date, cubic yards or metres of concrete including signed trip ticket for each truck, ambient air temperature, and unusual occurrences during placement of each pour. Permit inspection of records by Departmental Representative or Designate at any time. At completion of work, submit a summary of such data to Departmental Representative or Designate.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Portland Cement: CSA-A5 Normal, Type 10 Portland Cement.
 - .2 Coarse Aggregate: CSA-A23.1, Clause 5.4, Group I, 20-5mm.
 - .3 Fine Aggregate: CSA-A23.1, Clause 5.3.
 - .4 Water: CSA-A23.1 -M.

- .5 Water Reducing Admixture: Master Builders "Pozzolith Normal" conforming to ASTM (2494, Type A.
- .6 Anchor Bolt Protection: Clean, non-soluble, rust inhibitive grease and 0.254mm thickness polyethylene wrapping.
- .7 Grout: pre-mixed, non-shrink, flowable type conforming to ASTM-1 107 Grade C type, "Embeco 713" by Master Builders, "V3" grout by W.R. Meadows or Sika Grout 21 2 by Sika Canada Inc.; without aggregate fillers. Furnish forms as required for flowing-in-place.
- .8 Precision Grout: non-shrink flowable grout conforming to:, CSA A23.2-1B, with minimum compressive strength after 3 days of 42Mpa, and 28 day compressive strength of 62MPa, "Sika Grout 212HP" by Sika Canada Inc.
- .9 Grout Dry Pack: non-shrink grout conforming to ASTM-1107, "Sika M-Bed Standard" by Sika Canada Inc.
- .10 Bonding Agent: "Sika-Bur 32 Hi-Mod" by Sika Canada Inc. or "Bondlok" by W.R. Meadows.
- .11 Premoulded Joint Fillers: 12mm (1/2") x depth of slab foam with strip top for sealant, W.R. Meadows "Deck-O-Foam".
- .12 Curing/Sealing Compound: Sika Canada Inc. "Sika Florseal WB" water-based curing and sealing compound or equivalent by W.R. Meadows, except at slabs to receive subsequent toppings, beddings or coatings use water curing.
- .13 Insulation Joint Sealant at premoulded joint fillers: single component urethane, Sika "Sikaflex -1A" or Tremco "Dymonic".

2.2 Concrete Mixes

- .1 Provide concrete proportions in accordance with CSA-A23.1, Clause 14 and as follows:
 - .1 Minimum allowable compressive strength for various structures at 28 days shall be as scheduled on the Drawings.
 - .2 Minimum cement content shall be as required by concrete strengths.
 - .3 Slump at point of deposit shall be 25mm (1") min to 75mm (3") maximum. Increased slumps for floor slabs will only be allowed by use of super plasticizers, added per manufacturer's recommendations, not by the addition of water.
 - .4 Maximum water-cement ratio shall not exceed 0.50, except floor slabs on metal deck forms shall be 0.40 to 0.45.
 - .5 Use air-entrainment admixture for exterior exposed concrete to provide 5-7% air.

2.3 Admixtures

- .1 Add admixtures to concrete mix in accordance with manufacturer's recommendations.
- .2 Except as specified herein, comply with requirements of CSA-A266.4.
- .3 The use of calcium chloride or additional admixtures, other than those specified, is not acceptable.

PART 3 - EXECUTION

3.1 Examination

- .1 Obtain Departmental Representative or Designate site review of reinforcement and formwork before placing concrete. Provide 24 hour notice prior to placing of concrete.
- .2 Confirm that surfaces on which concrete is to be placed are free of frost, water, and debris before placing concrete.
- .3 Ensure that reinforcement, inserts and all other built-in work are in place and secured

before pouring concrete.

3.2 Setting and Building-In

- .1 Set and build in all inserts, anchors, frames, angles, sleeves, plates, etc. supplied by other trades. Advise all trades well in advance of scheduled pours to allow adequate time for the supply of items to be built in. Have respective trades verify location of items supplied by them.

3.3 Placing of Concrete

- .1 Place concrete in accordance with CSA-A23.1, Clause 19.
- .2 Install sluices to limit height of free fall of concrete to 4'-0" maximum. Place concrete to prevent layering and segregation and vibrate sufficiently to ensure thorough compaction, maximum density and according to CSA-A23.1. Hand spade concrete adjacent to forms with metal spatulas.
- .3 Before placing fresh concrete against set or partially set concrete, clean surfaces to remove all dirt, scum, shavings, debris, laitance, etc. On set surfaces, brush generously with a bonding mixture.
- .4 Check work frequently with accurate instruments during placing of concrete.

3.4 Finishing Formed Surfaces

- .1 Finish concrete to CSA-A23.1. Except where otherwise noted, finish all areas of concrete walls which are to remain visible in finish work by ensuring that honeycombed areas are mortared and rubbed flush, all forming lines or fins are removed and all rough areas are blended to provide a neat final finish to the satisfaction of the Departmental Representative or Designate.
- .2 Immediately after the removal of forms, remove or cut back ties or other metal not specifically required for construction purposes to a depth of 15mm (5/8") from the surface of the concrete.
Patch with cement/sand mix to match colour of concrete wall.
- .3 Rub exposed sharp edges of concrete with carborundum to produce 3mm radiused edges unless otherwise detailed. Do this work no later than 6 to 8 hours following form removal.

3.5 Anchor Bolt Protection

- .1 Adequately protect unburied portion of anchor bolts set in concrete, including nuts and washers from rusting, corrosion and damage by a heavy coating of specified coating material; wrap in a manner to exclude moisture.
- .2 Clean surfaces to be protected to bare steel followed by the specified protection system.

3.6 Grouting

- .1 Grout column base plates in accordance with the grout manufacturer's printed directions. Form around bases, place grout in a manner which will ensure positive bearing of the full area of the steel plate on top of the supporting surface. Thoroughly compact and "chain" as required, leaving no voids in grout.

3.7 Sealant Application

- .1 Prime, prepare substrate and apply sealant full joint depth in accordance with manufacturer's printed direction. Tool to a smooth semi-concave finish.

- 3.8 Floor Placement
 - .1 Moisten granular bedding prior to pouring concrete.
 - .2 Provide pre-moulded joint filler material at abutting structures as shown.
 - .3 Pour and screed slabs.

- 3.9 Floor Finish
 - .1 Slab exposed in the finished work: Screed, float and trowel interior concrete slabs to smooth level and dense surfaces free from trowel marks, ridges and depressions. Maximum variation of concrete slab shall not exceed 6mm (1/4" in 10'-0") non accumulative from datum line. Upon completion of work, survey floor with respect to conformance to the specified tolerance. Grind any unevenness as required to meet tolerance specified.
 - .2 Do not sprinkle dry cement or dry cement and sand mixture over concrete surfaces.

- 3.10 Curing/Sealing
 - .1 Immediately after steel troweling or float operations, apply curing/sealing compound sealer.
 - .2 Apply curing/sealing compound per manufacturer specifications.

- 3.11 Joint Sealant
 - .1 Strip removable top section of joint filler and clean edges of recess. Fill joints over pre-moulded joint filler with urethane sealant.

- 3.12 Defective Concrete
 - .1 Remove defective concrete, blemishes and embedded debris and repair or replace as directed by Departmental Representative or Designate

- END OF SECTION -

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- .1 Section 04 05 13 - Masonry Mortaring

1.2 REFERENCE STANDARDS

- .1 Standards and Guidelines for Conservation of Historic Places, Second Edition (2003)

1.3 SCOPE OF WORK

- .1 Repointing of exterior brick walls where mortar is missing or deteriorated as noted in the drawings.
- .2 Dismantling and resetting of loose bricks and the replacement of cracked, abraded, spalled, severely effloresced and/or missing units where noted on the Drawings and/or directed by the Departmental Representative.
- .3 Repointing of stone foundation both below and above grade as noted on the Drawings and/or specified herein.

1.4 QUALIFICATION

- .1 Provide for all work to be done by skilled and experienced tradesmen qualified in the type of work specified.
- .2 The work in this section shall be executed under the continuous supervision and direction of a competent mason.
- .3 Only a thoroughly experienced, reliable and properly qualified workman will be in charge of all mortar mixing for the duration of the job.

1.5 INSPECTION AND TESTING

- .1 Routine testing of materials, of proposed mortar mixes, and of final work for compliance with the specification will be carried out by the Departmental Representative or Designate.
- .2 If test results show that performance criteria are not met removal and repair of rejected work shall be performed at no additional cost.
- .3 All tests will be based on the mortar composition as outlined in Section 04 05 13 - Masonry Mortaring.

1.6 TEST PANELS (FOR REPAIR/REPOINTING)

- .1 Before commencement of work the contractor shall complete a min. 6 sq. ft. test panel demonstrating all aspects of the repair procedure for: brickwork; stone watertable band; stone rubble foundation.
- .2 The panel shall be located in an area of low public visibility as directed by the Departmental Representative or Designate.
- .3 The completed panel is to be used as the standard reference for acceptance or rejection of all repointing/restoration work on the job.
- .4 Start work after receiving notice of Departmental Representative or Designate's approval of the test panel.

1.7 SAMPLES

- .1 Clearly labelled samples of all materials to be used on the job shall be submitted to the Departmental Representative or Designate for approval before work starts.

- .2 The approved samples shall become the standard material used on the job. Substitutions shall not be permitted without written approval from the Departmental Representative or Designate.

1.8 STORAGE AND HANDLING OF MATERIALS

- .1 All materials are to be kept dry and free from contamination.
- .2 Manufacturers' labels and seals must be intact upon delivery.
- .3 Any material that has deteriorated or has been contaminated shall not be incorporated into the work, and must be removed from the site.
- .4 Carefully unload new brick on the site with competent workmen. Handle with such methods that will guard against soiling and chipping.
- .5 Stack brick on pallets or skids, clear of the ground to provide protection against soiling and staining.
- .6 Cover brick with clean plastic sheets, well tied down during extended storage or as required to prevent damage.

1.9 ENVIRONMENTAL REQUIREMENTS

- .1 All materials must be kept above 4 deg. C (40 deg. F). Materials are not to be heated above 76 deg. C (160 deg. F) at any time.
- .2 No mortar may be placed when the temperature is below 0 deg. C (32 deg. F), or below 4 deg. and falling. Repointing must not be done at temperatures above 27 deg. C (80 deg. F) unless shading and water-misted burlap over new work is provided to control evaporation.
- .3 All newly laid mortar, for a minimum of three days, is to be fully protected against freezing, rainfall, excessive heat, and /or dry winds. Enclosure, heating and shading may be required.
- .4 No masonry shall be laid up in lime mortar and left unprotected from freezing where there is a danger of a frost within 14 days after laying.

1.10 PROTECTION

- .1 All methods of enclosure and protection shall be to the approval of the Departmental Representative or Designate.
- .2 Newly laid mortar shall be protected from excessive exposure to rain, and full sunlight until the surface is thumb-print hard.
- .3 Provide and maintain protection for masonry walls at all times when work is suspended to prevent water from entering masonry.
- .4 Protection shall consist of non-staining plastic sheets, tarpaulins or burlap, secured to prevent lifting in high winds. Provide temporary bracing of brickwork during erection to prevent damage due to winds or other lateral loads until section is adequately braced.
- .5 Prevent the entry of dust, debris and water into the building by sealing all openings.
- .6 The public and all workmen must be protected from the effects of dust during cutting-out operations. The Contractor shall ensure that all workmen wear adequate, approved protective equipment during these operations and as required at other times.

PART 2 MATERIALS

2.1 BRICK

- .1 Match existing brick exactly in size, texture and colour of the adjacent sound material to remain. Salvage all sound brick for re-use from areas being dismantled. Note: This may require more than one brick type.
- .2 New bricks must be allowed to cure for at least TWO WEEKS after manufacture before being incorporated into the work to allow for initial expansion of units.
- .3 All new bricks are to be date stamped with year of installation on face. Numerals 10 mm high and 2 mm deep.

2.2 WATER

- .1 Water shall be potable and free from contamination and impurities.
- .2 Water with excessive quantities of soluble sulphates shall not be used as these salts contribute to efflorescence.

2.3 MORTAR

- .1 As specified in Section 04 05 13 - Masonry Mortaring

PART 3 EXECUTION

3.1 CUTTING-OUT GENERALLY

- .1 All cutting-out is to be done by skilled mechanics under the supervision of a competent mason experienced in this type of work.
- .2 All cutting-out of joints is to be done with hammer and chisel unless otherwise specified herein.
- .3 Joints improperly repointed with hard cement mortars may be partially cut out with power saws and grinding wheels under the following conditions:
 - .1 All work is to be done under the direction of the foreman.
 - .2 Power equipment may be used only to score one cut in each joint at the centre of the joint; the cut is to be no more than one half the width of the joint and cut to the full depth of the joint required.
 - .3 Final cutting-out of the joints is to be made with sharp bolsters, to detach the upper and lower fragments remaining. Do not clean joints with power equipment. All finish work is to be done by hand.
 - .4 Great care must be taken so as not to damage masonry units adjacent to joints. The Contractor may be required to provide replacement of masonry units damaged by cutting-out operations.
 - .5 When cutting-out is completed in each area all joints are to be brushed clean of debris and the joints blown clear with medium-pressure condensed air.

3.2 CUTTING OUT OF DEFECTIVE MASONRY

- .1 All spalled, cracked, badly fissured, powdery or otherwise defective masonry units are to be carefully cut-out of the walling and replaced with sound masonry units.
- .2 Defective units are to be removed and cut-back to the full depth, height and width of the complete unit, including all mortar bedding.
- .3 Headers are to be cut out for their full depth at least every 24"o.c. in each defective header course.
- .4 Hollow-sounding, loose or otherwise unstable or unbonded masonry units are to be taken down to solid material and the void cut out as above. Any sound masonry units are to be salvaged and re-incorporated into the work.

3.3 CUTTING-OUT OF DETERIORATED JOINTING

- .1 All seriously deteriorated joints are to be cut out to the full height of the joint and to the min. depth of 1" or twice the width of the joint, whichever is greater.
- .2 Seriously deteriorated joints are defined as having powdery or crumbling mortar; excessively soft mortar; loose or missing mortar; cracks that weaken the bond between units; voids.
- .3 Metal fittings such as nails, brackets, clips and the like should be removed from wall areas as cutting-out proceeds.
- .4 Sound adjacent joints are not to be cut out but left in their present state.
- .5 Areas of jointing using purely a hard cement and sand mix are, if causing damage to the surrounding masonry, to be treated as defective jointing and cut out.

3.4 FLASHING REGLETS

- .1 Flashing reglets are to be cut out to a depth of 1 1/4" and cleaned of all old caulking and asphaltic material and prepared for the insertion of flashing.

3.5 EXISTING WALL ACCESSORIES

- .1 Metal fixing plates, brackets, wire holders, nails, bolts, unused electrical equipment and the like are to be removed from the walling. Remove all screws, wooden plugs and blocking. Lead plug-anchors are to be drilled out and the hole filled with mortar.
- .2 Only full masonry units are to be used as fillers; do not parge the face of units to fill holes.

3.6 CLEANING-DOWN OF WALLING

- .1 When cutting-out is completed in each section, the wall is to be brushed down and all joints cleaned of all loose material and grit.
- .2 Thoroughly wet areas to undergo repointing and/or masonry replacement to remove all dust.

3.7 SOAKING AND WETTING OF BRICK UNITS

- .1 All brick masonry units that are to be used in the work are to be soaked with a running hose though not saturated for at least 24 hours before use, while stacked on the pallet and covered with tarpaulins to eliminate soluble salts as much as possible.
- .2 All bricks are to be thoroughly dampened immediately before use to minimize suction.

3.8 MASONRY REPLACEMENT

- .1 Loose masonry units are to be carefully removed and reset in a full bed of mortar.
- .2 Units are to be reset in a solidly and evenly filled bed of mortar, notwithstanding current trade practice.
- .3 Units are to be set true and level matching exactly the bond pattern and coursing throughout.
- .4 All joint widths are to match existing work. Joints are to be squeezed tight; slushing of joints is not permitted.
- .5 Areas of substantial brick repair are to be 'toothed' into existing work.
- .6 All masonry repairs must be completed before commencing general repointing. Joints in repaired areas are to be raked back 1" and allowed to set and dry for at least 72 hours to allow shrinkage to take place.

3.9 REPOINTING

- .1 Immediately before repointing operations commence, the area to be repointed is to be thoroughly blown clean with compressed air and flushed with water to remove all dust and to wet the surface well until suction is controlled and the surface stays wet.
- .2 Pointing is to be built up in layers (lifts) not exceeding 1/2" in depth; the bottom layers must be allowed to set before subsequent layers of mortar are applied.
- .3 All masons are to use identical jointing tools.
- .4 Joints are to be tooled behind the face of the masonry units.
- .5 All excess mortar must be removed from the face of the masonry before it sets and the pointing neatly finished to match 100% the joint profile noted on the Drawings.
- .6 Any staining to the masonry unit must be removed with sponge and water before it hardens.

3.10 CLEAN UP

- .1 Excess mortar shall be immediately removed from adjacent surfaces.
- .2 As work proceeds, clean all masonry with a fibre-bristle brush or plastic brush. Do not use a metal brush at any time.
- .3 Wash down the completed sections of wall from top to bottom as the pointing has hardened. Allow three days for the initial hardening of the mortar.

3.11 CURING

- .1 Cover all finish pointing with burlap. The burlap shall be hung approximately 50mm or less in front of the wall. The burlap shall be covered with white plastic tarps to reduce evaporation from the surface of the building.
- .2 Assist curing of mortar joints by applying water with a portable pressurized sprayer a minimum of three times a day for three days.
- .3 For the three day curing period, protect all newly placed masonry and repointed joints with tarps, shade covers so as to prevent drying from the wind and direct exposure to the sun.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

- | | | |
|----|------------------------------------|------------------|
| .1 | Historic – Mortaring | Section 04 03 08 |
| .2 | Brick Masonry: | Section 04 21 13 |
| .3 | Masonry Anchoring and Reinforcing: | Section 04 05 19 |

1.2 Reference Standard

- .1 Do masonry work in accordance with CAN3-A371-94 except where specified otherwise.

1.3 Product Delivery, Storage and Handling

- .1 Deliver materials to job site in dry condition.
- .2 Keep materials dry until use, except where wetting of bricks is specified.
- .3 Store under waterproof cover on pallets or plank platforms held off ground by means of plank or timber skids.

1.4 Cold Weather Requirements

- .1 When air temperature is below 5°C take the following precautions in preparing and using mortar:
 - .1 Heat sand slowly and evenly. Do not use scorched sand, having a reddish cast, in mortar.
 - .1 Gas fired heating apparatus is acceptable provided inspection of sand is requested prior to mixing mortar. Evidence of mixing scorched sand with the mortar mix may be cause for rejection of the whole batch by the Departmental Representative or Designate.
 - .2 Electric heating pads for mortar heating are acceptable (9 x 15' or 9 x 7.5' in size). Heat mortar for a minimum of 12 hours using this method – eliminates scorching of sand and reduces labour required to tens open fires. Pads should be UL or ULC approved.
 - .3 Alternate method, electric rod heater for water filled drum situated in sand pile – UL approved required. Heats both sand and water. Heating time about 8 to 12 hours and will keep up to 4 tons of sand thawed at sub-zero temperatures.
- .2 Heat water to 70°C maximum; 20°C minimum. Overheating of water will cause cement to set too quickly and reduce workability.
- .3 After combining heated ingredients maintain mortar between 5°C and 50°C until used.
- .4 Protect mortar from rain and snow.
- .5 Maintain dry beds for masonry and use dry masonry units only. Do not wet masonry units in winter.

1.5 Hot Weather Requirements

- .1 Protect freshly laid masonry from drying too rapidly, by means of waterproof, non-staining coverings.

1.6 Protection

- .1 Keep masonry dry using waterproof, non- staining coverings that extend over walls and down sides sufficient to protect walls from wind driven rain, until masonry work is completed and protected by flashings or other permanent construction.

- .2 Protect masonry and other work from marking and other damage. Protect completed work from mortar droppings. Use non-staining coverings.
- .3 Provide temporary bracing of masonry work during and after erection until permanent lateral support is in place.

PART 2 - PRODUCTS

2.1 Materials

- .1 Masonry materials are specified in related Sections of the Specifications.

PART 3 - EXECUTION

3.1 Workmanship

- .1 Build masonry plumb, level, and true to line, with vertical joints in alignment.
- .2 Layout coursing and bond to achieve correct coursing heights, and continuity of bond above and below openings, with minimum of cutting.

3.2 Tolerances

- .1 Walls to receive thinset materials or exposed in the finish work: plumb within 1:600.
- .2 Deviation in joint thickness: +/- 3 mm.

3.3 Exposed Masonry

- .1 Remove chipped, cracked, and otherwise damaged units in exposed masonry and replace with undamaged units.

3.4 Jointing

- .1 Allow joints to set just enough to remove excess water, then tool with round jointer to provide smooth, compressed, uniformly concave joints where concave joints are indicated.
- .2 Rake joint uniformly to 6 mm depth and compress with square tool to provide smooth, compressed, raked joints of uniform depth where raked joints are indicated.
- .3 Strike flush all joints concealed in walls and joints in walls to receive plaster, tile, insulation, or other applied material except paint or similar thin finish coating.

3.5 Joining of Work

- .1 Where necessary to temporarily stop horizontal runs of masonry, and in building corners;
 - .1 Step-back masonry diagonally to lowest course previously laid.
 - .2 Do not "tooth" new masonry.
 - .3 Fill in adjacent courses before heights of stepped masonry reach 1200 mm.

3.6 Cutting

- .1 Cut out neatly for electrical switches, outlet boxes, and other recessed or built-in objects.
- .2 Make cuts straight, clean, and free from uneven edges.

3.7 Building-In

- .1 Build in items required to be built into masonry.
- .2 Prevent displacement of built in items during construction. Check plumb, location and

- alignment frequently, as work progresses.
- .3 Brace door jambs to maintain plumb. Fill spaces between jambs and masonry with mortar.

- 3.8 Support of Loads
 - .1 Use 20Mpa concrete where concrete fill is used in lieu of solid units.
 - .2 Install building paper below voids to be filled with concrete; keep paper 25 mm back from faces of units.

- 3.9 Provision for Movement
 - .1 Leave 3 mm space below shelf angles.
 - .2 Leave 6 mm space between top of non-load bearing walls and partitions and structural elements. Do not use wedges.

- 3.10 Loose Steel Lintels
 - .1 Install loose steel lintels. Centre over opening width.

- 3.11 Control Joints
 - .1 Provide continuous control joints as indicated.

- 3.12 Existing Work
 - .1 Make good existing work. Use materials to match existing.

- 3.13 Testing
 - .1 Inspection and testing will be carried out by Testing Laboratory designated by Departmental Representative or Designate.
 - .2 Cost of testing will be paid from cash allowance specified in Section 01 4500 – Quality Control.

-END OF SECTION -

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- .1 Section 04 01 20.91 - Masonry Restoration and Repointing

1.2 QUALIFICATION

- .1 One thoroughly experienced, reliable and competent workman shall be in charge of all mortar mixing for the duration of the job.

1.3 SAMPLES

- .1 Clearly labelled samples of all materials to be used on the job shall be submitted to the Departmental Representative or Designate for approval before work starts.
- .2 The approved sample shall become the standard materials used on the job. Substitutions shall not be permitted without written approval from the Departmental Representative or Designate.

1.4 STORAGE AND HANDLING OF MATERIALS

- .1 Store cementitious materials in accordance with CSA A5. Store aggregates in accordance with CSA A23.
- .2 All materials are to be kept dry and protected from weather and contamination.
- .3 Manufacturers' labels and seals must be intact upon delivery.
- .4 Any material that has deteriorated or has been contaminated shall not be incorporated into the work and must be removed from the site.
- .5 Store lime putty in plastic-lined sealed drums. Do not allow lime putty to freeze at any time.

1.5 ENVIRONMENTAL REQUIREMENTS

- .1 All materials are to be kept above 4 deg. C (40 deg.F).
- .2 No mortar may be placed when the temperature is below 0 deg. C (32 deg. F), or below 4 deg. C (40 deg. F) and falling. Repointing must not be done at temperatures above 27 deg. C (80 deg.F) unless shading and water-misted burlap over new work is provided. All work must be suspended during frosty weather unless a heated enclosure is provided. Work should not be done in full sun at temperatures above 27 deg. C unless shading of the walls is provided.

PART 2 PRODUCTS

2.1 WATER

- .1 Water shall be potable and free from soluble salts and other contaminants.

2.2 CEMENT

- .1 Cement shall be Type 10 white portland cement to CAN3-A5-M77 as manufactured by Federal White Cement Ltd., Woodstock, Ontario.

2.3 LIME

- .1 Lime shall be hydrated mason's lime or dolomitic finishing lime.

2.4 AGGREGATE

- .1 The aggregate shall be a well-graded washed sand matching the texture and range of sizes found in the mortar to be matched. The colour of the sand shall be an exact match of the original; a blending of sands may be required. Ideally the colour of the mortar should derive from the sand.

PART 3 EXECUTION

3.1 HYDRATED LIME

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

3.2 PREPARATION OF ROUGHAGE

- .1 If the contractor desires, the lime and aggregate may be pre-mixed to produce what is known as roughage or coarse-stuff. This compound may be stored indefinitely if kept sealed from air and kept from freezing.
- .2 Lime hardens slowly through the absorption of carbon dioxide (carbonation), in contrast to hydraulic cements that set quickly through a reaction with water.
- .3 The sand and lime should be accurately proportioned using measuring boxes constructed to contain the exact volume of each ingredient required to make one batch. These materials are to be thoroughly mixed in a mechanical mixer for about ten minutes and then stored in plastic-lined drums and sealed until required.
- .4 When required for use the correct portion of gauging cement should be added and the mix worked up as specified and used immediately.
- .5 As the strength and colour of even slightly different mixes vary dramatically, accurate portioning is a strict requirement of this specification.

3.3 CEMENT GAUGING OF MORTARS

- .1 The addition of hydraulic cements to lime and aggregate mixes must be done immediately before the use of the mortar.
- .2 All mortar must be used within two hours of gauging; do not re-temper mortars after this time has elapsed.
- .3 All batching is to be done with wooden boxes or plastic pails of known volume to ensure standardization and conformity of measurement. Shovel measurement of materials is not permitted. Boxes shall be of such a size that a batch sufficient for one mixer load is measured out.
- .4 Initially, mortars shall be mixed for five minutes without cement or the addition of water. Careful addition of a small amount of water should produce a mortar that is just wet enough to hang on a trowel. Excess water creates a shrinkage problem and water content in excess of 5% will retard carbonation significantly.
- .5 Cement shall be added and mixed for about two minutes before use.
- .6 The amount of water required shall be recorded and added at the start of mixing for future batches.
- .7 Mortars must be mixed for about ten minutes before using to improve workability, increase air entrainment and plasticity and ensure thorough mixing.
- .8 All mixing boards and mechanical mixing machines must be cleaned between batches.
- .9 Strict control must be exercised so that too wet a mix is **not** used. The addition of water does improve workability but does so at the sacrifice of mechanical strength and an

increase in final shrinkage. Only water lost through evaporation should be replaced at the mortar-board by the mason; a spray bottle is used for this purpose.

3.4 MIX FORMULAE:

- .1 For stone foundation below and above grade, and chimneys:
 - .1 TYPE N - 1 Cement: 1 Lime: 6 Sand.
- .2 For other general brick walling:
 - .1 TYPE O - 1 Cement: 2 Lime: 9 Sand.

3.5 STRENGTH OF MORTAR

- .1 The strength gain and final strength of the mortar is a criteria for acceptance of the finished work.
- .2 The 28-day strength of the Type 'N' mortar shall be between 5MPa and 8MPa. The 28 day strength of Type 'O' mortar to be between 3.5 and 5 MPa. Mortar stronger or weaker than these limits may be rejected at the sole discretion of the Departmental Representative or Designate.
- .3 The standards regarding mortar allow both slower and lower strength gain than required to realize the 5MPa to 8MPa 28-day strength. It is anticipated that the 7-day strength of the Type 'N' mortar should be 3MPa to 4MPa to reach the final strength without exceeding 8MPa. The 7 day strength of the Type 'O' mortar may be 2 MPa to 3 MPa.
- .4 Mixing proportions, workability and strength are interrelated and it is a requirement of the Contract that the Contractor work with the Departmental Representative or Designate to achieve an acceptable mortar. The mix formulas give in the above have been found to generally give the desired strengths.

END OF SECTION

PART 1 - GENERAL

- 1.1 Related Work
 - .1 Common Work Results for Masonry: Section 04 05 10
 - .2 Mortar and Grout for Masonry: Section 04 05 12
 - .3 Masonry Accessories: Section 04 05 23
 - .4 Brick Masonry: Section 04 21 00
 - .5 Concrete Unit Masonry: Section 04 22 00
- 1.2 Reference Standards
 - .1 Do reinforcing and connecting of masonry in accordance with CSA-A370 and CSA-A371 latest editions unless specified otherwise.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Connectors: to CSA-A370-94.
 - .1 Interior walls: corrosion resistant or non corroding connectors:
 - .1 Concrete Block horizontal reinforcing equal to: Blok-Lok , blok-trus BL30
 - .2 Concrete block to structural column equal to: Blok-Lok, web-tie flex-o-lok BLT9, BLT9 A, column -lok BLT10 or
 - .2 Exterior walls: corrosion resistant or non-corroding connectors equal to Ferro Slotted Block Tie Type I.
 - .2 Reinforcement: to CSA-A371 latest edition.
 - .3 Control joints: equal to Titewall BL-A control joint by Blok-Lok.

PART 3 - EXECUTION

- 3.1 Horizontal Reinforcing
 - .1 Install in each wythe of masonry elements at vertical intervals 400 mm maximum, horizontal reinforcement comprising of two 3.8 mm rods, each rod 25 mm from each face, and lapped 150 mm at each splice.
- 3.2 Bonding and Tying
 - .1 Bond walls of two or more wythes using metal ties in accordance with CSA-S304-94, latest edition in force of the Ontario Building Code, and as indicated.
 - .2 Tie masonry veneer backing in accordance with Ontario Building Code and CSA-S304-94. Use dovetail straps sized to suit anchor slots where veneer is backed by concrete.
- 3.3 Bolts and Anchors
 - .1 Embedded bolts and anchors solidly in mortar or grout to develop maximum resistance to design forces.
- 3.4 Control Joints
 - .1 Stop reinforcing 25 mm short of each side of control joints unless otherwise indicated.

3.5 Lateral Support and Anchorage

- .1 Provide lateral support and anchorage in accordance with CSA-S304-94 and as indicated.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

- | | | |
|----|----------------------------------|------------------|
| .1 | Common Work Results for Masonry: | Section 04 0510 |
| .2 | Mortar and grout for masonry: | Section 04 05 12 |
| .3 | Masonry accessories: | Section 04 05 23 |

1.2 References

- .1 CAN/CSA-A82.1-M87 Burned Clay Brick (Solid Masonry Units Made From Clay or Shale).

PART 2 - PRODUCTS

2.1 Face Brick

- .1 Burned clay brick: to CAN/CSA A82.1-M87, CMB MU-1, ASTM C-67 and ASTM C-216-87, Type FBX for smooth, FBS/B for wire cut, and FBS/C for rough face.
 - .1 Grade: SW.
 - .2 Compressive strength: 55 MPa (8000 psi) minimum.
 - .3 Face Brick: size and style to match that of existing building.
 - .4 Colour and texture: to match existing.

PART 3 - EXECUTION

3.1 Laying

- .1 Bond: Running stretcher unless indicated otherwise on the Drawings.
- .2 Coursing height: 200 mm (8") for three bricks and three joints. Match that of existing brick work.
- .3 Jointing: concave where exposed or where paint or similar thin finish coating is specified.
- .4 Mixing and blending: mix units within each pallet and with other pallets to ensure uniform blend of colour and texture.

3.2 Cleaning Unglazed Clay Masonry

- .1 One week after laying bricks and after mortar has set and cured, clean 10 m² area of wall designated by Departmental Representative or Designate as a sample. If no harmful effects appear and after mortar has set and cured, protect windows, sills, doors, trim and other work, and clean brick masonry as follows:
 - .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 published by Brick Institute of America dated Sept./Oct. 1977.
- .5 Test acid cleaning method on designated area of wall, followed by waiting period of at least one week, before proceeding with cleaning.

END OF SECTION

PART 1 - GENERAL

- | | | |
|-----|------------------------------------|------------------|
| 1.1 | Related Work | |
| .1 | Common Work Results for Masonry: | Section 04 05 10 |
| .2 | Mortar and grout for masonry: | Section 04 05 12 |
| .3 | Masonry Anchorage and Reinforcing: | Section 04 05 19 |
| .4 | Masonry accessories: | Section 04 05 23 |

PART 2 - PRODUCTS

- | | | |
|-----|---|--|
| 2.1 | Materials | |
| .1 | Standard concrete masonry units: to CSA-A165 Series-M85(CSA-A165.1). | |
| .1 | Classification: H/15/B/M. | |
| .2 | Size: metric modular. | |
| .3 | Special shapes: provide bull-nosed units for exposed corners (all interior wall corners and wall ends). Provide purpose-made shapes for lintels and bond beams. Provide additional special shapes as indicated. | |
| .2 | Autoclaved cellular concrete masonry units to be used for all exterior wall: to CSA A165.4-M85. | |

PART 3 - EXECUTION

- | | | |
|-----|---|--|
| 3.1 | Laying Concrete Masonry Units | |
| .1 | Bond: running stretcher. | |
| .2 | Coursing height: 200 mm for one block and one joint. | |
| .3 | Jointing: concave where exposed or where paint or other finish coating is specified. | |
| 3.2 | Concrete Masonry Lintels | |
| .1 | Install reinforced concrete block lintels over openings in masonry where steel or reinforced concrete lintels are not indicated. | |
| .2 | End bearing: not less than 200 mm or as indicated on drawings. | |
| 3.3 | Cleaning | |
| .1 | Allow mortar droppings on unglazed concrete masonry to partially dry then remove by means of trowel, followed by rubbing lightly with small piece of block and finally by brushing. | |

PART 1 - GENERAL

- .1 Description of the Work
 - .2 Provide all necessary bracing/shoring to the Work support stonework remaining when removals occur and support from below or lateral stability may be lost. Ensure that all masonry remains stable at all times. The Contractor shall submit shop drawings for all bracing/shoring systems to the Departmental Representative or Designate for review and shall not proceed with these systems until approval is given by the Departmental Representative or Designate.
 - .3 Submit four copies of all shop drawings and allow eight working days for review by the Departmental Representative or Designate. Do not commence with any of the proposed works, requiring the bracing/shoring schemes, until approval is given by the Departmental Representative or Designate.
- 1.2 Related Work
 - .1 Section 04 43 03 - Repair of Stone Masonry
 - .2 Section 04 43 04 - Repointing & Miscellaneous Masonry
 - .3 Section 04 43 05 - Stone Masonry Removals
- 1.3 Definitions
 - .1 Bracing: temporary support installed in excavation or structure to increase rigidity in both the longitudinal and transverse axes and thus stabilize against deformations or possible collapse.
 - .2 Shoring: temporary support installed in an excavation or structure to relieve vertical and/or horizontal loads to permit alterations or repairs to foundation or main supporting elements.
- 1.4 Shop Drawings
 - .1 Submit shop drawings for bracing and shoring system, in accordance with Section 01 33 23.
 - .2 Shop drawings to indicate shop and erection details.
 - .3 Shop drawings to bear the stamp of a registered Professional Departmental Representative or Designate in the of Ontario engaged and paid by the Contractor as part of the work.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Structural members: solid timber or built-up timbers of group A, B, C, or D graded structural No. 1 to CAN/CSA-0141-91.
 - .2 Structural steel members: to CSA G40.21-98, grade 300 or grade 350, type W.
 - .3 Wood connections: Canadian soft wood plywood to CSA 0151-M1978, Douglas Fir plywood to CSA 0121-M1978, Poplar plywood to CSA 0153-M1980 sheathing grade.
 - .4 Steel connections: steel plates and angles to CSA G40.21-98, grade 300 or grade 350, type W.
 - .5 Nails: to CSA B111-1974.
 - .6 Bolts: lag screws, nuts and washers to CAN3-086-M84.
 - .7 High-tensile bolts: to ASTM A325M-86 Welding materials: CSA W59-M1984.

- .8 Jack posts: steel jack posts shall be capable of supporting the loadings required. Threads shall be well greased to minimize friction and permit adjustment under load.

PART 3 - EXECUTION

3.1 Inspection

- .1 Before work is begun, inspect conditions upon which this work depends for damage and weakness and inform the Departmental Representative or Designate in writing of conditions not discussed in contract.

3.2 Installation

- .1 Erect structural timber to CAN3-086-M84
- .2 Erect structural steel work to CAN3-, S16.1-M84 and Can3-S126-M84.
- .3 Weld to CSAW59-M1984.
- .4 Obtain approval from the Contractor's Departmental Representative or Designate and the Departmental Representative or Designate before execution, if alteration to bracing/shoring system is found to be necessary.

3.3 Bracing and Shoring

- .1 Install braces and/or shoring to support masonry to remain.
- .2 Install braces as required to maintain stone masonry in a safe and stable condition.
- .3 Install packing behind wall pieces to compensate for unevenness of wall surfaces.

3.4 Adjustment

- .1 Before making necessary adjustments to work, obtain approval from the Departmental Representative or Designate.

3.5 Maintenance

- .1 Maintain effectiveness of system by making adjustments, replacing or repairing damaged and weakened elements of system until final completion of project.

3.6 Measurement and Payment

- .1 No measurement for payment will be made for the work of this section. All costs for labour, materials, equipment, etc. necessary to complete the work of this section are deemed to be included in the related items of work for which unit or a lump sum price are bid.

END

PART 1 - GENERAL

1.1 Description of the Work

- .1 This section covers the requirements for the installation of stone masonry (complete or Dutchman repairs) at locations indicated on the drawings and as directed by the Departmental Representative or Designate. New stone shall be used unless otherwise approved by the Departmental Representative or Designate or as called for on the drawings.
- .2 It is anticipated that the quantity of stone installation will directly correspond to the designated areas for replacement (either as shown on the drawings or as directed by the Departmental Representative or Designate). The estimated quantity of replacement is listed on the Tender form for the related item(s). This quantity will vary in accordance with the condition of the stone and the ability to remove stones without damage to adjacent stones, which are to remain. Adjustments, to the quantities, will be made as the work progresses.
- .3 In general, stone installation shall replicate the "original" installation in terms of stone unit "squareness," matching thickness to adjacent or standard units, level and, square to level. Variance from this will only be permitted as directed by the Departmental Representative or Designate.

1.2 Standards

- .1 All masonry restoration to be to CSA A371-94, "Masonry Construction for Buildings" and as augmented by these specifications.
- .2 "Connectors for Masonry" to be in accordance with CSA A370-94 and as augmented by these specifications and the contract drawings.
- .3 "Mortar and Grout for Unit Masonry" to be in accordance with CSA A179-94 and as augmented by these specifications.
- .4 All work to be supervised by skilled and experienced tradesmen in the type of work specified. The work of this section shall be executed under the continuous supervision and direction of a competent mason.

1.3 Samples

- .1 Where new stone is directed to be used by the Departmental Representative or Designate (or is called for on the drawings), submit samples of replacement stones to the Departmental Representative or Designate for review and approval. Do not use stone or sources that have not been approved.
- .2 Samples of used or previously quarried stone: submit one stone, sized and dressed to match existing stone units. Make supply of stone accessible to Departmental Representative or Designate. Departmental Representative or Designate may select any number of stones for sampling and request sizing and dressing according to requirements.

1.4 Precautions

- .1 Move and lift stone units using means to prevent dropping or sudden impacts. Stone units, dropped or impacted, are to be reviewed by the Departmental Representative or Designate and approved before installation. Do not make holes or indentations, for Lewises or dogs, on face or top side of stone.
- .2 Indicate bedding planes of stone units. Duplicate bedding marks on usable pieces of cut stone.

1.5 Protection

- .1 Cover top of completed and partially completed wall, not enclosed or sheltered, with weatherproof coverings at end of each working day. Anchor securely in position.
- .2 Protect adjacent work from marking or damage.
- .3 Provide temporary bracing of masonry work, during erection, until permanent structure provides adequate bracing.

PART 2 - PRODUCTS

2.1 Cut Stone

- .1 All stone surfaces of new cut stone against which mortar is to be placed shall be intentionally roughened (if the face is "smooth" as a result of sawing) by scoring with awl or grinder. Score lines shall be spaced at no more than 25 mm on centre and shall be not less than 3 mm in depth nor deeper than 6 mm.

PART 3 - EXECUTION

3.1 Cutting/Sizing of Stone

- .1 Use callipers, squares and levels to measure opening for new stone. Allow for mortar joints to match existing, or as directed by the Departmental Representative or Designate, around the stone perimeter. The space between the back of the new stone units and face of existing shall be nominally 25 mm (this space to be filled with mortar).

3.2 Moving Stones

- .1 If Lewises or dogs are used to lift stones, use Lewises or dogs on the sides of stones only and conform to the provisions of the Occupational Health and Safety Act.
- .2 Move stones horizontally in wheelbarrows, on carts or on sleds.
- .3 Slide stones into place on wood ramps.

3.3 Stone Installation

- .1 Clean stone by washing with water and natural fibre brush before laying. Stone should not be dry at time of placing .
- .2 All stones shall be placed with the bedding planes horizontal unless, for a specific stone, the Departmental Representative or Designate directs otherwise. Every effort will be made to avoid vertical bedding planes except in pieces where no other option, regardless of cost, exists.
- .3 Dampen surfaces of wall opening and apply mortar to stone perimeter.
- .4 Where there is more than one course of stone replacement, lay successive stone courses only after mortar in courses below has hardened sufficiently to support weight.
- .5 Prop and anchor stones until mortar has set.
- .6 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.
- .7 Remove mortar droppings from face of stone before mortar is set. Sponge stone free of mortar, as work progresses .
- .8 Set stones plumb, true, level in full bed of mortar with vertical joints flushed full except where otherwise specified. Completely fill anchor, dowel and lifting holes.

3.4 Filling Joints/Pointing

- .1 Fill joints and point in accordance with Division 4.
- .2 Moist cure new mortar for a minimum of 5 days.

3.5 Measurement and Payment

- .1 Measurement for payment for the items, "Installation of Stone Masonry" shall be by the cubic metre (m³). This quantity will generally be equivalent to the removal quantity.
- .2 Payment at the unit price bid for the item, "Installation of Stone Masonry" shall be full compensation for all labour, equipment and materials necessary to do the work of this item in accordance with the Contract Drawings and these Specifications including:
 - .1 Placing of all mortar and back-up masonry to fill the total voids behind the stone units.
 - .2 Placing of the salvaged stone and new stone.
 - .3 Pointing of joints around the stone units.

END OF SECTION

PART 1 - GENERAL

- 1.1 Description of the Work
 - .1 The work of this section covers the requirements for all masons to attend an orientation prior to working on the project.
- 1.2 Related Work
 - .1 Division 4 - Masonry
- 1.3 Measurement and Payment
 - .1 No measurement for payment will be made for the work of this section. All costs for the work of this Section shall be included in the tendered prices for related work items.
 - .2 The Contractor shall be fully familiar with the Contract Specifications and inform the Departmental Representative or Designate of any direction during the orientation that would result in an extra cost to the contract prior to commencing the work. Work that is completed according to the orientation that contradicts the specification shall not receive extra compensation beyond the tendered prices and at the discretion of the Departmental Representative or Designate may require removal and replacement.

PART 2 - ORIENTATION

- 2.1 Orientation Content
 - .1 The content of the orientation meeting shall be generally as follows:
 - .1 Pre-Construction Orientation for Mason's – The intent of this orientation is to have all masons understand what will be expected of them with respect to joint removal, stone removal, stone preparation, stone installation, scratch coat pointing and final coat pointing. As a result, more consistent results are anticipated from all masons with a minimization of rejected work. ALL MASONS, that will be associated with any element on this project as described above, are required to attend the orientation meeting prior to beginning the work. The orientation time should not last for more than one (1) hour. The material discussed in this orientation is taken directly from the specification and reflects the expectations of that specification. Test panels will still be required to establish the standard of workmanship. All masons should be aware of the work in preparing the panels at the various steps. If a mason is not present, for the test panel it will not excuse that mason from understanding and implementing the procedures used for the preparation of that panel.
 - .2 Prior to the orientation the content of this specification section shall be read or known by all potential masons.
 - .3 The masonry orientation course will only be offered when the Departmental Representative or Designate is available and a reasonable number of times as determined by the Departmental Representative or Designate.
 - .4 Joint Removal
 - .1 Masons shall take care so as not to damage the surrounding stone that is to remain.
 - .2 If a grinder is required to remove the joint, the mason shall only make one (1) pass on the joint and shall locate the pass in the center of the joint.

- . 3 The mason is not permitted to allow the grinder to score the surrounding stone that is to remain.
- . 4 Chisels shall be thin enough so as not to bind on the adjacent stones and potentially damage the stones.
- . 5 Joint material shall be completely removed back to the required depth as described on the drawings.
- . 6 Loose jointing material is to be removed; any additional joint material removal is to be reviewed by the Departmental Representative or Designate and direction given prior to removal.
- . 7 Thoroughly clean joint with a non-metallic brush and compressed air. Water is not to be used for the cleaning of the joints.
- . 5 Stone Removal
 - . 1 Mortar joints shall be removed, as much as possible, on all of the surrounding joints of the stone that has been marked for removal prior to its removal.
 - . 2 If the stone is to be salvaged, the mason shall exercise care while removing the stone unit. If the stone is not to be salvaged, the mason may use whatever means he feels is necessary to remove the stone while preserving the surrounding stones to remain.
 - . 3 Under no circumstances shall adjacent stones be used as lever points for pry bars, pneumatic chisel bits, percussion drills, etc. to help in the removal of the stone. If the Contractor thinks that removal of an individual stone will not be possible without damaging an adjacent stone, this must be discussed with the Departmental Representative or Designate prior to removal. The Contractor will be responsible for damages unless the Departmental Representative or Designate agrees in writing that damage is unavoidable prior to the work.
 - . 4 Damaging of adjacent stones will result in the repair or replacement of the stone at the Contractor's expense.
 - . 5 The resulting cavity shall be braced, cleaned, and protected from the elements until a new matching stone is installed in the cavity.
 - . 6 If adjacent stones become loose during the removal process, the mason shall quickly stabilize the area and the Departmental Representative or Designate is to be informed.
- . 6 Stone Preparation
 - . 1 Stones are to be handled carefully so as not to excessively stress or damage the stones.
 - . 2 Cut stones to the dimensions required allowing for the correct joint width, usually 10 to 15 mm or to match the surrounding joint work. Seek direction from the Departmental Representative or Designate before creating joints wider than 15 mm.
 - . 3 Stones cut using a saw, must have the smooth cut faces roughened with grooves as described in the specification.
 - . 4 Stones are to be cut square and straight on the exposed faces. The pitch of the exposed face shall match that of the adjacent, existing stone.
 - . 5 In situations where several stones are to be replaced, the mason shall ensure that the layout matches, as closely as possible, the existing stone layout and furthermore avoids small "slivers" of stone to fill irregular spaces. Eliminate stone "slivers" when possible.
 - . 6 Creating stack bonding is to be avoided and will be rejected and must be replaced.

- . 7 Stones are to be laid with the bedding planes in the horizontal orientation unless otherwise approved by the Departmental Representative or Designate.
- . 8 Stones shall be cleaned with water and a soft, non-metallic, bristle brush to remove dust.
- . 9 Carefully transport the stones so as to do no damage.
- . 7 Stone Installation - (The mortar used for the installation of stone units may have a slightly lower air percentage; this should be reviewed on site with the Departmental Representative or Designate and labourer responsible for preparing mortar).
 - . 1 Cavity is to be free of loose mortar or debris.
 - . 2 Lightly wet the cavity with water prior to applying the mortar bedding or backup. Just apply enough water to moisten the area; avoid standing water situations.
 - . 3 The stone unit should also be lightly wetted.
 - . 4 Install stone on a bed of mortar, pack mortar around the stone. Make sure that the head joints are equal in width and that the top and bottom joints are also equal in width.
 - . 5 Stone is to be placed square and plumb and in alignment to adjacent stone. Shim stones as required maintaining the position. The shims shall be soaked softwood wedges. Under no circumstances shall stone chips be used as shims.
 - . 6 Clean excessive mortar away from stones immediately. Clean stone with a damp sponge.
 - . 7 Once the mortar has stiffened remove excess joint material and finish joint to accept the finish coat of mortar. Thin joints should be finished to the final state as shown on the drawings.
- . 8 Scratch Coat Pointing
 - . 1 Thoroughly clean joint with a non-metallic brush and compressed air.
 - . 2 Slightly moisten the joints. Over wetting will result in the mortar thinning out and being "messy" to work with. by not wetting the joints prior to mortar installation, the surrounding joint and stone will wick away the water in the newly placed mortar resulting in a weakened mortar joint .
 - . 3 Install mortar to a point just proud of the required depth for the final finished pointing. Press the mortar in firmly. Allow the mortar to stiffen. When the mortar has stiffened, remove the excess mortar being careful not to smooth out the joint.
 - . 4 The finish of the scratch coat pointing should be rough but not "messy." The intent is to provide a good mechanical bond between the scratch and the finish coats of pointing.
 - . 5 Wide joints should be treated in the manner specified, with coarser sand and stone chip aggregate in the mix.
 - . 6 Additional lifts of mortar shall be placed after a minimum of 24 hours of moist curing on the previous lift.
 - . 7 Protect mortar joints, during the curing period, from the effects of weather. Joints should be misted regularly with water but, not overly wetted.
- . 9 Final Coat Pointing
 - . 1 Lightly clean joints with non-metallic brush and compressed air.
 - . 2 Slightly moisten the joints. Over wetting will result in the mortar thinning out and being "messy" to work with, by not wetting the joints prior to mortar installation the surrounding joint and stone will wick away the water in the mortar resulting in a weakened mortar joint.
 - . 3 Install mortar to a point just proud of the face of the adjacent stone. Press the mortar in firmly.

- . 4 Allow the mortar to stiffen to 'thumb print' hard. Once mortar has stiffened, remove the excess mortar with a wooden dowel in a firm consistent stroke. The mortar is to have a slightly concave appearance. The head joints should be finished first. The dowel will 'pull' the mortar exposing the aggregate.
- . 5 Lightly brush the joint with a bristle brush, taking care not to remove the texture but to ensure consistency in the final appearance.
- . 6 Clean excessive mortar away from stones immediately. Clean stone with a damp sponge.
- . 7 Cover the area with burlap and moist cure for five (5) days. To prevent excessive drying of burlap due to wind or sun, the burlap is to be covered with white plastic. The burlap is not to be in prolonged contact with the masonry since discoloration can occur.

END OF SECTION

PART 1 – GENERAL

- 1.1 Description of the work of this section covers the, the Work requirements for the supply and cutting / facing of new stone to be used on this project.
- 1.2 Related Work .
 - .1 Section 04 43 07 - Installation of Stone Masonry
- 1.3 Standards
 - .1 ASTM C568-99 Standard Specification for Limestone Dimension Stone.
- 1.4 Samples
 - .1 Samples of all types of stones are required. Samples will be of sufficient size to demonstrate all finishes and profiles and shall be clearly marked as to location of quarry of origin and the supplier(s). Samples which are approved may be incorporated in the work provided that they match all dimensions of stones scheduled as being replaced. The finish of any ornamental stone shall match the undeteriorated profile of each type of stone. The surface shall be finished to match the undeteriorated finish of each type of stone and in no case shall the finish be rougher than stones of this type in good condition elsewhere in the wall.
 - .2 Acceptability of the source of stone will also be determined by the weathered colour of the stone. Samples should include weathered examples and a possible visit to the quarry may be required for acceptance. In general, the weathered colour should match the predominate stone colour of the overall monument. The colour of the new stone should not be close in colour to the extreme ends of the range of stone colours present in the structure.
 - .3 Limestone sources which have stylolitic inclusions in the stone matrix (sometimes PWGSC, Cut Stone occurs in large bed depths) will not be acceptable.
- 1.5 Delivery and Storage
 - .1 Deliver, store and handle cut stone in a manner to prevent damage, adulteration, deterioration and soiling.
- 1.6 Definitions
 - .1 Face Stone: Stone to be used in replacement of wall stone, whether as a complete unit or new facing, which are generally square.
 - .2 Ornamental Stone: Stone to be used in replacement of decorative stones with curved surf aces.
 - .3 Carved Stones: Stones such as the winged victory and lions which must be produced by a sculptor and represent a very special stone in the Monument.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Stone shall be Category 1 limestone from Queenston Limestone - Queenston Limestone sources are thought to be exhausted and it is unlikely new stone will be sourced. Salvaged stone from other sources would be of concern as Queenston Limestone quarried before

approximately 1895 was of better quality and different colour than stone quarried from the same quarry after 1895.

- .2 Indiana Limestone:
 - .1 There are several sources and colours of Indiana Limestone and samples will be required. Some of the grey versions with beige undertones were compared to the stone of the Monument and were found to be acceptable alternatives .
- .3 Samples of these and other quarries submitted for acceptance will be required. There are variations in colour within each quarry and not all stone from each quarry will be acceptable.

2.2 Cutting

- .1 Cut stone to shape and dimensions and full to square with jointing and profile to match existing. Dress exposed faces true. Cut stone to lay on its natural quarry bed and to an accuracy of 3 mm of original dimensions of the undeteriorated stones and opening for stone.
- .2 Make beds and joints to match adjacent masonry and at right angles to face.
- .3 Provide Lewis pin and clamp holes in pieces which cannot be manually or mechanically lifted without damage. Do not cut holes in exposed surfaces.

2.3 Finish

- .1 Tool the face to match the finish of the stone being removed or to match adjacent masonry to which the stone is being placed.
- .2 Score machine cut faces to provide a rough surface for mortar adhesion (see Section 04 43 07, Installation of Masonry).
- .3 Front profiles and patterns shall match adjacent stones. For ornamental stones, provide shop drawings indicating patterns and profiles.

PART 3 - EXECUTION

3.1 General

- .1 Early in the project, inspect the masonry with the Departmental Representative or Designate and determine the extent of stone replacement required. Supply replacement stones by number, key code and size.
- .2 Supply stones to the site and protect from damage. Cut stones as required to match existing and to CAN3-S304-M78. Finish stone to match existing.
- .3 In order to expedite stone delivery, the intent is to immediately supply and finish as much stone as possible by identifying stones.
- .4 All face finishing debris and end cut-offs which are not used shall be removed from the site.
- .5 Cut all stones to match existing coursing.
- .6 In the case of deep stones, the Departmental Representative or Designate will direct what depth of stone behind the face will be replaced. Generally, the minimum depth will be 200 mm behind face joint that results in deepest stone

3.2 Stone Finish

- .1 Face stones shall be finished with bush hammer finish to match existing. Mark stone arises and remove excess stone from all faces. Pitched faces, where required, shall match existing.

3.3 Setting

- .1 Clean stone exposed surfaces by washing with stiff fibre brush and water.
- .2 Drench dry stones with clean water just before setting.

3.4 Stone Supply

- .1 As part of this Contract, review the work to establish the actual quantity required to finalize the supply and minimize over-supply and losses. Be responsible for acceptance of the supplied and finished stone and prepare for review by the Departmental Representative or Designate.

END OF SECTION

PART 1 - GENERAL

- 1.1 Related Work
 - .1 Concrete Unit Masonry: Section 04 22 00
 - .2 Miscellaneous Metals and Fabrication: Section 05 50 00
 - .3 Painting: Section 09 91 23

- 1.2 Quality Assurance
 - .1 All welding and erection of structural members to be carried out only by a contractor certified by the Canadian Welding Bureau to the requirements of W47.1 - 1983 - Certification of Companies for Fusion Welding of Steel Structures to the requirements of Division 1 or 2.1.

- 1.3 References
 - .1 CAN/CSA-S16.1-M89, Limit States Design of Steel Structures.
 - .2 CAN/CSA-S136-M89, Cold Formed Steel Structural Members.
 - .3 All supply, fabrication and erection shall conform to the latest revision of the following codes and standards or to their latest metric editions:
 - .1 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding).
 - .2 The Occupational Health and Safety Act and Regulations for Construction Projects Prepared by the Ontario Ministry of Labour.
 - .4 CAN/CSA-G40.20-M87, General Requirements for Rolled or Welded Structural Quality Steel.
 - .5 CAN/CSA-G40.21-M87, Structural Quality Steels.
 - .6 ASTM A36/A36M-89, Specification for Structural Steel.
 - .7 ASTM A325M-89, Specification for High-Strength Bolts for Structural Steel Joints.
 - .8 ASTM A490M-89, Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints.

- 1.4 Design of Details and Connections
 - .1 Design details and connections in accordance with requirements of CAN/CSA-S16.1 and CAN/CSA-S136 with CSA S136.1 to resist forces, moments and shears indicated.
 - .2 If connection for shear only (standard connection) is required:
 - .1 Select framed beam shear connections from an industry accepted publication such as "Handbook of the Canadian Institute of Steel Construction".
 - .3 If shears are not indicated, select or design connections to support reaction from maximum uniformly distributed load that can be safely supported by beam in bending, provided no point loads act on beam.
 - .3 For non standard connections, submit sketches and design calculations stamped and signed by qualified professional Engineer registered or licensed in Province of Ontario.

- 1.5 Shop Drawings
 - .1 The Contractor shall prepare detailed erection diagrams and shop details based on the design drawings and project specifications for all work
 - .2 On erection drawings, indicate all details and information necessary for assembly and erection purposes such as:
 - .1 All dimensions necessary to locate all steel members

- .2 Piece mark and designation or description of steel members. Elevations of base plates.
 - .3 Grid lines of main column centre lines.
 - .4 Full details of all field connections.
 - .5 Torque of all anchor bolts.
 - .3 Shop details shall give complete information necessary for the fabrication of all steel work including:
 - .1 Material and product type, grade, and label with associated codes and standards.
 - .2 Full details of all members and parts showing designation or full description, including camber, coping, stiffeners, etc.
 - .3 Type and size of all mechanical fasteners and welds.
 - .4 All bolt holes for field connections.
 - .5 All holes for attachment for other trades included in Contractors scope of work.
 - .6 Areas not to be painted such as areas to be encased in concrete, the faying surfaces of all high-strength bolted connections, and all areas within 3 inches of field welds.
 - .7 All welding shown on the erection drawings and shop details shall be detailed in full to the requirements of Article 4.1.1.2. of CSA Standard W59 - "Welded Steel Construction (Metal-Arc Welding)."
 - .4 **Reproduction of contract drawings for use as erection drawings is not permitted unless approved in writing by Departmental Representative or Designate.**
 - .5 Each drawing submission shall bear signature and stamp of qualified professional Departmental Representative or Designate employed by the Contractor who is registered or licensed in the province of Ontario who shall take all responsibility for all design done by the Contractor for all fabricator designed assemblies, components and connections, etc.
- 1.6 Inspection and Acceptance Standards
- .1 All work will be subject to inspection at any time by qualified inspectors engaged by the Owner.
 - .2 All inspection companies responsible for welding inspection shall be certified to CSA Standard W78, Qualification Code for Welding Inspection Organizations, for all methods of inspection, testing and categories applicable to this work. As a minimum, all welds will be visually inspected.
 - .3 Should any work fail to meet the standards specified, it will be rejected by the Inspector and rectified or replaced at the expense of the Contractor. The method of correcting the unsatisfactory work will be subject to the approval of the Departmental Representative or Delegate.
 - .4 The Contractor shall cooperate in permitting access to all places where work is being done or where material is stored and shall provide all mill test reports and other relevant information to assist the inspector in his duties. In the event that mill test reports are not made available to the inspector, the Departmental Representative or Designate may request independent testing at the Contractor's expense.
 - .5 If the inspector suspect defects in materials or workmanship that warrants further testing and this testing reveals actual defects, the Contractor will pay the cost of the additional testing.
 - .6 Inspection or lack of inspection does not absolve the Contractor from completing all phases of the work in accordance with the design drawings and project specification and agreed schedules.

PART 2 - PRODUCTS

2.1 Materials

- .1 Should be of Canadian manufacturer, whenever possible, and be in accordance with the design drawings and project specification and other sub-sections of this specification as well as all governing codes and regulations.
- .2 Unless otherwise indicated on the design drawings or project specification, steel shall conform to CAN/CSA-G40.20 - "General Requirements for Rolled or Welded Structural Quality Steel" and to CAN/CSA-G40.21 - "Structural Quality Steels" to the following grades:
 - .1 Hot Rolled Shapes: 300W (44W)
 - .2 Plates for Welded Shapes: 300W (44W)
 - .3 HSS (Class H): 350W (50W)
 - .4 Cold Formed Shapes: 350W (50W)
- .3 Anchor bolts: to CAN/CSA-G40.21, ASTM A36/A36M.
- .4 Bolts, nuts and washers: to ASTM A325M or ASTM A490M, tightened by the "turn of the nut" method in accordance with CSA S16.1 unless noted otherwise on the drawings. Select bolt lengths such that threads are excluded from shear lines.
- .5 Welding materials: to CSA W59 and certified by Canadian Welding Bureau.
- .6 Hot dip galvanizing: galvanize steel, where indicated, to CSA G164, minimum zinc coating of 600 g/m².
- .7 Shear studs: to CSA W59, Appendix H.

2.2 Fabrication

- .1 Fabricate structural steel, as indicated, in accordance with CAN/CSA-S16.1 and CAN/CSA-S136 and in accordance with reviewed shop drawings. Include all components required for total structural integrity coordinated with the work of other sections.
- .2 Take field measurements before fabrication where required and make necessary adjustments. Provide continuous structural supports for all floor plates including across column faces, base plates, framing members, inside and outside corners, complete perimeter of all openings or protrusions, etc.
- .3 Ends of all HSS to have end closure plates.
- .4 All exterior HSS columns, diagonals and struts to have weep holes drilled into the lowest points.
- .5 Install shear studs in accordance with CSA W59.
- .6 Continuously seal members by continuous welds where indicated. Grind smooth.

2.3 Shop Painting

- .1 Clean, prepare surfaces and shop prime structural steel in accordance with CAN/CSA-S16.1 and CAN/CSA-S136 except where members to be encased in concrete.

PART 3 - EXECUTION

3.1 General Erection

- .1 The Contractor shall make adequate provision for erection loads and provide sufficient temporary bracing to keep the structural steel frame plumb and in true alignment until

- completion of erection, final bolting, and grouting. When requested, the Contractor shall submit calculations of wind and erection stress and sketches of temporary bracing checked and stamped by a Professional Departmental Representative or Designate registered with the Association of Professional Departmental Representative or Designates of Ontario experienced in this type of work.
- .2 Unless noted otherwise do structural steel work and erection tolerances shall be in accordance with CAN/CSA S16.1.
 - .3 Do welding in accordance with CSA W59 by companies certified under Division 1 or 2.1 of CSA W47.1 for fusion welding of steel structures.
 - .4 Upon completion of the work, the Contractor shall remove all supplies, materials, tools, equipment, debris and rubbish from the site. Debris and rubbish should be removed from Global Stone property and taken to the dump. The Contractor is responsible for keeping the site clean and free of debris and rubbish during construction. The Contractor will leave the structure broom clean and free from mud, grease and other deleterious matter.
 - .5 No burning of structural steel members shall be undertaken without the approval of the Departmental Representative or Designate.
 - .6 All column bases will be erected on steel shims not wood wedges, located at the corners. The bases shall be grouted under Section 03300. When grout is set, remove all shims and have pockets re-grouted under Section 03300. Shims shall be sized to reduce the bearing capacity of temporary loads to within acceptable stress levels so that damage to concrete piers is avoided.
 - .7 Torque all anchor bolts to the following levels:
 - .1 3/4" dia.: 60 ft. lbs.
 - .2 1" dia.: 140 ft. lbs.
 - .3 1-1/4" dia.: 260 ft. lbs.
 - .4 1-1/2" dia.: 440 ft. lbs.
 - .8 Provide double nuts on all anchor bolts.

3.2 Connections

- .1 The steel contractor shall follow the instructions of the design drawings when detailing all connections on his shop drawings. Alternatives or modifications to connections detailed on the design drawings including welding details that the Steel Contractor prefers for fabrication or erection reasons shall be clearly marked as such on the submitted shop drawings and shall provide a strength equal to or greater than the connection as detailed or specified on the design drawings and Specification. The Departmental Representative or Designate reserves the right to reject any such alternative or modification to connections.
- .2 Where connections are not detailed on the design drawings or design loadings are not indicated, the fabricator shall design and detail connections capable of developing the full capacity of the member in shear, tension, compression or bending as applicable. All channel and beam end connections shall be designed to develop the shear capacity of the member unless specifically noted otherwise.
- .3 Shear type bolted connections shall be designed as slip-resistant (friction-type) connections with tight clean mill scale as faying surfaces.
- .4 In the fabrication of connections, all faying surfaces of bolted connections shall be blast cleaned and kept free from paint and cleaned of any oil or foreign matter prior to erection.
- .5 All bolts are to be ASTM A325M or ASTM A490M, tightened by the "turn of the nut" method in accordance with CSA S16.1 unless noted otherwise on the drawings. Select bolt lengths such that threads are excluded from shear lines.

- .6 Bolts required for loose sliding connections shall be brought to a snug tight condition and then backed off 1/4 turn using 'Stover' locknuts. All welding to be in accordance with CSA Standard W59 - "Welded Steel Construction (Metal-Arc Welding)".
 - .7 All welds shall be performed by welders holding a valid certification for the process, position, and class of electrode to be involved. All welds to bear the identification stamp of the welder.
 - .8 The Contractor shall submit to the Owner a copy of his Procedure Data Sheets for each weld.
 - .9 The minimum size of fillet welds shall be 3/16" or as required by the material thickness of the thicker part joined.
 - .10 HSS tube welds to be equal in size to the tube wall thickness unless noted otherwise on the project drawings.
- 3.3 Connection to Existing Work
- .1 Verify dimensions and condition of existing work before commencing fabrication and report any discrepancy and potential problem areas to Departmental Representative or Designate and await instructions.
- 3.4 Field Painting
- .1 Paint in accordance with Section – 09 91 23 - Painting.
 - .2 Touch up all damaged surfaces and surfaces without shop coat with primer to CAN/CGSB-1.40. Apply in accordance with CGSB 85-GP-14M.

END OF SECTION

PART 1 - GENERAL

- 1.1 Work included
 - .1 Metal brackets
 - .2 Lintels as required
 - .3 Miscellaneous sections. Refer to drawings for notes.

- 1.2 Related Work
 - .1 Installation of anchors in masonry: Section 04 05 19
 - .2 Installation of steel angle lintels: Section 04 05 19
 - .3 Finish painting: Section 09 91 23

- 1.3 Reference Standards
 - .1 Do welding work in accordance with CSA W59 latest edition unless specified otherwise.

- 1.4 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00 Submittals.
 - .2 Clearly indicate materials, core thickness', finishes, connections, joints, method of anchorage, number of anchors, supports, reinforcement, details, and accessories.

PART 2 - PRODUCTS

- 2.1 Materials
 - .1 Steel sections and plates: to CSA-G40.21- M91, Grade 300W.
 - .2 Welding materials: to CSA W59-1989.
 - .3 Bolts and anchor bolts: to ASTM A307-84a.
 - .5 Galvanizing: hot dipped galvanizing with zinc coating 600g/m2 to CSA G164-M92.
 - .6 Shop coat primer: to CGSB 1-GP-40M.
 - .7 Galvanized primer: zinc rich, ready mix to CGSB 1- GP-181M+Amdt-Mar-78.
 - .8 Grout: non-shrink, non-metallic, flowable, 24h, MPa 15, pull-out strength 7.9 MPa.

- 2.2 Fabrication
 - .1 Fabricate work square, true, straight and accurate to required size, with joints closely fitted and properly secured.
 - .2 Fabricate items from steel unless otherwise indicated.
 - .3 Use self-tapping shake-proof countersunk flat headed screws on items requiring assembly by screws or as indicated. Use screws for interior metal work. Use welded connections exterior metal work unless otherwise approved by Departmental Representative or Designate.
 - .4 Where possible, fit and shop assemble work, ready for erection.
 - .5 Ensure exposed welds are continuous for length of each joint. File or grind exposed welds smooth and flush. Seal exterior steel fabrications to provide corrosion protection in accordance with CSA-S16.1-94.

- 2.3 Shop Painting
 - .1 Apply one shop coat of primer to metal items, with exception of galvanized or concrete

- encased items.
- .2 Use primer unadulterated, as prepared by manufacturer. Paint on dry surfaces, free from rust, scale, grease. Do not paint when temperature is lower than 7°C.
- .3 Clean surfaces to be field welded; do not paint.

2.4 Angle Lintels

- .1 Steel angles: prime painted, sizes indicated for openings. Provide 150 mm minimum bearing at ends.
- .2 Weld or bolt back-to-back angles to profiles as indicated.

PART 3 - EXECUTION

3.1 Erection

- .1 Erect metalwork square, plumb, straight, and true, accurately fitted, with tight joints and intersections.
- .2 Provide suitable means of anchorage acceptable to Departmental Representative or Designate such as dowels, anchor clips, bar anchors, expansion bolts and shields, and toggles.
- .3 Make field connections with high tensile bolts to CSA-S16.1-94, or weld.
- .4 Hand items over for casting into concrete or building into masonry to appropriate trades together with setting templates.
- .5 Touch-up rivets, field welds, bolts and burnt or scratched surfaces after completion of erection with primer.
- .6 Touch-up galvanized surfaces with zinc rich primer where burned by field welding.

3.2 Angle Lintels

- .1 Supply mason with loose angle lintels of sizes indicated, for openings in masonry walls unless otherwise noted. Shop prime prior to delivery.
- .2 Provide a minimum of 150 mm bearing at ends. Weld angles together where installed back-to-back.

- END OF SECTION -

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 09 91 00 - Painting.

1.2 DESCRIPTION

- .1 This section describes the work, techniques and materials necessary to restore the interior wood trims, framing, exterior siding and all other exterior wood work.

1.3 PRODUCT STORAGE AND HANDLING

- .1 Protect work area, where damaged material has been cut away, with tarpaulins to protect from infiltrating weather.
- .2 Provide adequate support with stickers to material stored on site and cove with tarpaulins.

1.4 DATE STAMPING

- .1 All new material is to be date stamped, on the backside, with the year of installation, presumed to be 2014.
- .2 Numerals should be 10 mm high and two mm deep, punched into the surface.

PART 2 MATERIALS

2.1 NAILS

- .1 In accordance with Part 9 of NBC 2010 as supplemented by following requirements except where specific type is indicated.
- .2 Nails, spikes and staples, length and type to NBC 9.23.3B except:
 - .1 Use common spiral nails and spiral spikes except where indicated otherwise.
 - .2 Use hot dipped galvanized finish steel for exterior work, interior highly humid areas and for pressure- preservative and fire-retardant treated lumber except where indicated otherwise.
- .3 Bolt, nut, washer, screw and pin type fasteners: with hot-dip galvanized finish to CSA G164-M92 for exterior work, interior highly humid areas and for pressure- preservative treated lumber, elsewhere with primer paint finish where installed on sight-exposed surfaces.
- .4 Use surface fastening of following types, except where specific type is indicated.
 - .1 To hollow masonry, plaster and panel surfaces use toggle bolt.
 - .2 To solid masonry and concrete use expansion shield with lag screw, jute fibre or lead plug with wood screw.
 - .3 To structural steel use bolts through drilled hole, or welded stud bolts or power driven self-drilling screws, or welded stud-bolts, or explosive actuated stud-bolts.
- .5 Joist hangers: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation as indicated on drawings.
- .6 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy type approved by Departmental Representative or Designate.

2.2 WOOD

- .1 Species to be eastern white pine.
- .2 Grade to be No. 1 or better.
- .3 Ensure that moisture content is less than 10%.

- .4 Laminated or finger jointed material will not be accepted.
- .5 Note that sizes are not standard; thicknesses may range from 7/8" to 1" to 5/4" for example. Note that this will require custom cutters and oversized stock by present industry standards.

2.3 FASTENERS

- .1 Size, placement and appearance of fasteners to match existing.

2.4 ADHESIVE

- .1 Adhesive for repairs to be G2 Epoxy by Industrial Formulators or approved equivalent.

2.5 WIND BARRIER

- .1 "Tyvec"TM or approved equal.

PART 3 EXECUTION

3.1 DISMANTLING

- .1 All required dismantling shall be done with extreme care, taking appropriate precautions not to damage adjacent material or the components themselves.
- .2 Take care with tools to avoid marring, crushing or splitting components. If necessary, nails which have to be removed should be snapped off on the back of the component or pulled through from the back of the component rather than driven back through the face.
- .3 All components that are being dismantled shall be labeled and retained for the duration of the job.
- .4 Labeling shall be done with a dark indelible marker on the back of the component.
- .5 Contractor shall store the components in such a way that they are protected from the weather and are accessible for easy reference throughout the job. Objects shall be stored together in logical groups to prevent any object from being misplaced or lost.
- .6 Components shall be appropriately stacked, padded and supported to prevent deterioration, warping, abrasion or other forms of damage.
- .7 Any small items, such as hardware, shall be stored and labeled in re-sealable plastic bags.
- .8 Remove and discard all extraneous fasteners where directed by Departmental Representative or Designate.

3.2 EXECUTION

- .1 Refer to drawings for locations of damaged wood to be replaced.
- .2 Generally, decayed or deteriorated components are to be cut back to sound material, and new material is to be spliced in, taking care to match exactly the cross sectional size, profile and orientation of grain.
- .3 Prepare 6" long samples of all new moulding profiles along with 6" samples of the profiles they are intended to match for review by Departmental Representative or Designate prior to milling the material.
- .4 Back prime all hidden surfaces of new material, especially end grain, prior to installation.
- .5 Joint patterns in siding and trim shall match existing and shall be tight so that after finishing they are only visible from close inspection.
- .6 Where wall siding is being completely replaced, such as the south and north walls of the west wing lean to, new siding is to have a vented air space behind. After removal of deteriorated wood work, apply wind barrier to historic substrate. Install a 600 mm continuous strip of insect screen across bottom of wall, 300 mm up the wall and the

- remainder hanging down - apply 6 mm thick by 40 wide battens from top to bottom of wall, at 600 on centre and at corners and openings – fold the bottom half of the screen up and over the bottoms of the strapping and apply siding from bottom up.
- .7 Match pattern of existing siding in terms of how it is gauged around the window opening.

END OF SECTION

PART 1 - GENERAL

- 1.1 Reference Standards
 - .1 Pressure treat wood in accordance with CAN/CSA 080.1-M89.
- 1.2 Certificates
 - .1 For products treated with preservative or fire-retardant by pressure impregnation submit following information certified by authorized signing officer of treatment plant:
 - .1 Information listed in AWP.A.M2-81 applicable to specified treatment.
 - .2 Moisture content after drying following treatment with water-borne preservative or fire-retardant.
 - .3 Acceptable types of paint, stain, and clear finishes that may be used over treated materials to be finished after treatment.
 - .4 Applicable WHMIS documentation for distribution to the Owner.

PART 2 - PRODUCTS

- 2.1 Preservative Treatments
 - .1 Treat indicated material to CAN/CSA 080.1-M89 using CCA preservative to obtain minimum net retention as recommended by manufacturer.
 - .2 Following water-borne preservative treatment, dry material to maximum moisture content of 15%.
- 2.2 Fire-Retardant Treatment
 - .1 Treat indicated material by pressure impregnation with fire-retardant chemicals in accordance with CSA 080.20 to provide classification for flame spread as indicated to meet code.
 - .2 Following treatment, kiln-dry, material to maximum moisture content of 15%.
 - .3 Each board or bundle of fire-retardant treated material to bear ULC inspection label indicating flame spread, smoke developed, and fuel contributed classification.

PART 3 - EXECUTION

- 3.1 Caution
 - .1 Avoid direct skin contact when handling pressure treated wood. Use gloves. Wash exposed areas of skin thoroughly after contact.
 - .2 Do not inhale sawdust, wear dust masks and where possible perform cutting operations outside. Wear protection for eyes when power sawing and machining.
 - .3 Do not burn treated wood, dispose as garbage.
 - .4 Select material which will remain exposed such that no surface residues are visible
- 3.2 Field treatments of preservative - treated products
 - .1 Comply with AWP.A.M4-80.
 - .2 Remove with fine sandpaper, chemical deposits on treated wood to receive applied finish.
 - .3 Treat cuts with hand applied preservative/fire retardants.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

- | | | |
|----|---------------------------------|------------------|
| .1 | Structural Steel for Buildings: | Section 05 12 23 |
| .2 | Wood Treatment: | Section 06 05 73 |
| .3 | Vapour Retarders: | Section 07 26 00 |
| .4 | Gypsum Board Assemblies: | Section 09 21 16 |

1.2 Source Quality

- .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.

PART 2 - PRODUCTS

2.1 Lumber Material

- .1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% or less in accordance with following standards:
 - .1 CSA 0141-1991.
 - .2 NLGA Standard Grading Rules for Canadian Lumber, 1987 edition.
- .2 Machine stress-rated lumber is acceptable for all purposes.
- .3 Framing and board lumber: in accordance with Table 9.3.2.A of OBC 1997 except as indicated or specified otherwise.
 - .1 General work: SPF species, NLGA #1 or #2 grade, S4S, 15% moisture content.
 - .2 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
 - .1 Use S2S or S4S material.
 - .2 Board sizes: SPF species, NLGA #2 grade.
 - .3 Dimension sizes: SPF species, NLGA #2 grade.
 - .3 Cants, curbs, nailers for roofing: SPF species, NLGA #2 grade.
 - .4 Sleepers for roof and floor: cedar species, NLGA #2 grade.

2.2 Panel Standards

- .1 Panel standards: type, grade and thickness as specified, in accordance with following standards:
 - .1 Douglas fir plywood (DFP): to CSA 0121- M1978, standard construction.

2.3 Panel Materials End Uses

- .1 Roof sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP grade, T&G edge, 13 mm thick.
- .2 Exterior wall sheathing:
 - .1 Plywood, DFP or CSP sheathing grade or PP grade, square edge, 13 mm thick.

2.4 Dampproof Membrane

- .1 Polyethylene film: to CAN/CGSB-51.33-M89, Type 1, 0.15 mm thick.

2.5 Fasteners and Hardware

- .1 In accordance with Part 9 of OBC 1997 as supplemented by following requirements except where specific type is indicated.
- .2 Nails, spikes and staples, length and type to OBC 9.23.3B except:
 - .1 Use common spiral nails and spiral spikes except where indicated otherwise.
 - .2 Use hot dipped galvanized finish steel for exterior work, interior highly humid areas and for pressure- preservative and fire-retardant treated lumber except where indicated otherwise.
- .3 Bolt, nut, washer, screw and pin type fasteners: with hot-dip galvanized finish to CSA G164-M92 for exterior work, interior highly humid areas and for pressure- preservative treated lumber, elsewhere with primer paint finish where installed on sight-exposed surfaces.
- .4 Use surface fastening of following types, except where specific type is indicated.
 - .1 To hollow masonry, plaster and panel surfaces use toggle bolt.
 - .2 To solid masonry and concrete use expansion shield with lag screw, jute fibre or lead plug with wood screw.
 - .3 To structural steel use bolts through drilled hole, or welded stud bolts or power driven self-drilling screws, or welded stud-bolts, or explosive actuated stud-bolts.
- .5 Joist hangers: minimum 1 mm thick sheet steel, galvanized ZF001 coating designation as indicated on drawings.
- .6 Roof sheathing H-Clips: formed "H" shape, thickness to suit panel material, extruded 6063-T6 aluminum alloy type approved by Departmental Representative or Designate.

2.6 Wood Preservative

- .1 Surface-applied wood preservative:
 - .1 Wood preservative SWP-1: conforming to CSA 0132.1-Series - 90 Section 5 except that preservative shall be coloured.
 - .2 Wood preservative SWP-2: copper naphthenate base, water repellent wood preservative clear. Pentachlorophenol based products are not permitted.

PART 3 - EXECUTION

3.1 Appearance Grade Materials

- .1 Install lumber and panel materials designated "Appearance" (A) Grade so that grade-marks and other defacing marks are not visible on surfaces specified to be left unfinished or to be finished with translucent or transparent type coating. Surface cutting or sanding to remove such marks is acceptable only in locations where defacement will not be evident after finishing.

3.2 Erection of Framing Members

- .1 Install members true to line, levels and elevations.
- .2 Construct continuous members from pieces of longest practical length.
- .3 Install spanning members with "crown-edge" up.

3.3 Furring and Blocking

- .1 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.
 - .2 Install furring to support siding applied vertically where there is no blocking and where sheathing is not suitable for direct nailing.
 - .3 Align and plumb faces of furring and blocking to tolerance of 1:600.
- 3.4 Nailing Strips, Grounds and Rough Bucks
- .1 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.
 - .2 Except where indicated otherwise use material at least 38 mm thick secured with 9 mm bolts located within 300 mm from ends of members and uniformly spaced at 1200 mm between.
 - .3 Countersink bolts where necessary to provide clearance for other work.
- 3.5 Cants, Curbs, Fascia Backing
- .1 Install wood cants, fascia backing, nailers, curbs and other wood supports for roofing and sheet metal work as required and secure using galvanized fasteners.
 - .2 Secure with 9 mm bolts where indicated, galvanized nails elsewhere. Locate fastenings within 300 mm from ends and uniformly spaced between. Space bolts at 1200 mm and nails at 600 mm centres except where indicated otherwise.
 - .3 Staple vapour retardant sheet strip to underside of nailers before installation. Apply strip continuous with 200 mm overlap at joints, free of wrinkles or tears, with at least 200 mm exposed for overlap on roof deck.
 - .4 Install wood nailers for roof hopper, dressed, tapered and recessed slightly below top surface of roof insulation.
- 3.6 Fasteners
- .1 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.
 - .2 Countersink bolts where necessary to provide clearance for other work.
 - .3 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.
- 3.7 Surface-Applied Wood Preservative
- .1 Treat surfaces of material with wood preservative, before installation. Wherever possible apply preservative after materials have been cut and fit to size.
 - .2 Apply preservative by dipping, or by brush or spray to completely saturate and maintain wet film on surface for minimum 3 minute soak on lumber and one minute soak on plywood.
 - .3 Re-treat surfaces exposed by cutting, trimming or boring with liberal brush application of preservative before installation.
 - .4 Treat all material as follows:
 - .1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.

- END OF SECTION -

PART 1 - GENERAL

1.1 References

- .1 CSA A101-M1983 Thermal Insulation, Mineral Fibre, for Buildings.
- .2 CSA B111-1974 Wire Nails, Spikes and Staples.

PART 2 - PRODUCTS

2.1 Insulation

- .1 Mineral fibre: to CSA-A101, equal to Roxul Plus insulation in semi-rigid batts. Fire resistant, moisture resistant (absorption no greater than 1% water). Sizes as noted.

2.2 Vapour Barrier Film

- .1 Polyethylene film to CAN2-51.33-M89. Tape for sealing as recommended by manufacturer.

2.3 Accessories

- .1 Staples: 12 mm minimum leg.
- .2 Sealant: to CGSB 19-GP-21M.

PART 3 - EXECUTION

3.1 Insulation Installation

- .1 Install insulation to maintain continuity of thermal protection to building elements and spaces.
- .2 Fit insulation closely around electrical boxes, pipes, ducts, frames and other objects in or passing through insulation.
- .3 Do not compress insulation to fit into spaces.
- .4 Do not enclose insulation until it has been inspected and approved by Departmental Representative or Delegate.

3.2 Vapour Barrier Installation

- .1 Install polyethylene on warm side of insulation and tight to insulation.
- .2 Staple vapour barrier to framing members. Lap joints 150 mm (6") minimum and tape seal. Ensure joints occur over framing members.
- .3 Tape seal areas where nails or staples penetrate vapour barrier and at points of penetration. Attach warning labels to walls with vapour barrier.
- .4 Extend vapour barrier tight to perimeter of windows, door frames and other items interrupting continuity of membrane. Seal with sealant.

END OF SECTION

PART 1-GENERAL

1.1 Work Included

- .1 Provide spray application of polyurethane Foam to provide insulation, air barrier and vapour barrier as shown on Drawings and specified herein.

1.2 Related Work

- | | | |
|----|------------------------|------------------|
| .1 | Brick Masonry: | Section 04 21 13 |
| .2 | Concrete Unit Masonry: | Section 04 22 00 |
| .3 | Rough Carpentry: | Section 06 10 10 |

1.3 References

- .1 CAN/ULC S705.1-98 Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
- .2 CAN/ULC S705.2-98 Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Installer's Responsibilities - Specifications.
- .3 Canadian Urethane Foam Contractors Association (CUFCA)" Manual for Installers of Spray Polyurethane Foam Thermal Insulation".
- .4 CCMC Evaluation Report 12380-R Insulation material.
- .5 CCMC Evaluation Report 12893-R Air barrier material.
- .6 CNRC A-3136 Investigation report of Water Vapour Transmission.

1.4 Submittals

- .1 Before commencing work, submit the following in accordance with Section 01340: Results of independent laboratory test reports, product data sheets, physical properties, meeting or exceeding requirements of the standard and specification.
- .2 Submit a laboratory report of the adhesion compatibility with: flashing, membranes, coatings and substrates.
- .3 Submit license under CUFCA and certification of applicators under CUFC/NECA (National Energy Conservation Association) prior to the commencement of work.
- .4 Submit manufacturer's conformity certification to NBC requirements for the polyurethane foam system.
- .5 Submit independent laboratory results on vapour permeance properties (ASTM E96 system) for three samples in each composition wall.

1.5 Quality Assurance

- .1 Contractor performing work under this section must be licensed under CUFCA (Canadian Urethane Foam Contractors Association) Quality Assurance Program.
- .2 Applicators performing work under this section must be trained and certified by CUFCA/NECA (National Energy Conservation Association).
- .3 Submit a copy of the contractor quality control report as requested in CAN/ULC-S705.2.
- .4 Prior to full application, spray and test a mock-up area 1m² (10 ft²) in accordance with Section 01340.

1.6 Delivery, Storage and Handling

- .1 Deliver materials in manufacturers original sealed containers clearly labelled with manufacturer's name, product identification, safety, information, net weight of contents and expiration date.

- .2 Store material in a safe manner and where the temperatures are in the limits specified by the material manufacturer.
 - .3 Remove empty containers from site on a daily basis in accordance with CANULC-S705.2.
- 1.7 Application Conditions
- .1 At the beginning and during the work, leave access on the job site to product manufacturer representatives for technical support and assistance.
 - .2 Execute the work of this section when the temperature of the air and substrate are within the limits of the data sheet supplied by the manufacturer.
 - .3 Apply the spray-foam only when the relative humidity is lower than 80%.
 - .4 Prepare all oily surfaces with primer, following manufacturer's recommendations.
- 1.8 Protection
- .1 Ventilate area to receive insulation to maintain non-toxic unpolluted, safe working conditions.
 - .2 Protect workers as recommended by standards and manufacturer's recommendations.
 - .3 Protect adjacent surfaces, windows, equipment and site areas from damage of over spray.
- 1.9 Testing
- .1 CUFCA Representative shall visit the Site and perform Quality Assurance testing including the following:
 - .1 Inspect for defects and deficiencies
 - .2 Inspect for areas of off-ratio foam perform random thickness, density, adhesion and cohesion tests. Number of tests shall be determined by Project area.
 - .3 Provide Field Inspector Audit Sheet per NECAICUFCA requirements.

PART 2 - PRODUCTS

- 2.1 Materials
- .1 Furnish spray applied polyurethane foam insulation system in accordance with CAN/ULC-S705.1 Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.
 - .2 Product Heatlock 0240 / A100 as manufactured by Demilec Inc.

<u>Physical Properties</u>	<u>Test</u>	<u>Objective</u>	<u>Result</u>	<u>Unit</u>
.1 Density	ASTM D1622	Min.	32	Kg/m ³
.2 Thermal Resistance	ASTM C518 90 days/23°C	Min.	1.22/25mm 6.93 / 1"	RSI R
.3 Water vapour permeance	ASTM E96 (25mm)	Max.	86.6	ng/Pa s m ²
.4 Dimensional stability	ASTM D2126	(% of change in volume at 28 days)		
	-20°C	Min.	+0.47	%
	70°C R.H.>97+/-3%	Max.	+2.58	%
	100%	Max.	+5.89	%
.5 Flame spread	CAN/ULC S 102-M88	Max.	335	
.6 Self-extinguishing	MVSS 302	Min.	B (Self-extinguishing)	
.7 Compressive strength	ASTM D1621	Min.	174	KPa
.8 Tensile strength	ASTM D1623	Min.	212	KPa
.9 Open cells	ASTM D2856	Min.	6.0	%
.10 Water absorption	ASTM D2842 (96 hrs.)	Max.	0.62	%

.11	Air barrier	at 75 Pa	ASTM E283 (with substrate)	Max.	0.000	L/s/m ²
		at 75 Pa	CCMC 12893-R (25mm free)	Max.	0.00014	L/s/m ²
		At 3000 Pa	ASTM E330		No delamination	
.12	Water vapour permeance for spray foam polyurethane applied on concrete blocks (25mm on substrate)		ASTM E96 (system)	Max.	36.4	ng/Pa s m ²
.13	Water vapour permeance for spray foam polyurethane applied on exterior gypsum board (25mm on substrate)		ASTM E96	Max.	68.3	ng/Pa s m ²

2.2 Primers

- .1 Furnish primers per manufacturers recommendations and CANIULC S705.2 for surfaces conditions.
- .2 For steel oily surface furnish LSC 517 Contact Cement from Lepage, colour: red.

2.3 Equipment

- .1 Furnish equipment as recommended in CANIULC 5705.2 and approved by foam manufacturer for type of application.

PART 3 - EXECUTION

NOTE: check the adhesion compatibility with: flashing, membranes and coatings

3.1 Examination

- .1 Verify that surfaces and conditions are suitable to accept work specified herein.
- .2 According to the prescriptions of the standard CANIULC S750.2 verify the conditions of surfaces.
 - .1 Surfaces-to be covered with spray foam should be free of an excess of moisture, frost, oil, rust and any other foreign material able to have a negative affect on the adhesion of the product.
 - .2 Make sure of the complete cure of the substrates, concrete, mortar, fillers, membranes, primers, coatings or other surfaces, before foam application, taking into account climatic conditions.
- .3 If the thickness of application is greater than 50mm and if the application and cure temperature is lower than 00C, use galvanized steel mechanical fastener of 90" angle; 13mm x 25mm x 0.42mm in thickness (gypsum corner bead), fixed at 600mm on centre each way.
- .4 Perforated Z-bars (100mm openings at 250mm c/c) to assure the mechanical continuity of the foam will be provided by siding trade.
- .5 Respect the moisture content of the different materials.
- .6 In the case of particular conditions comply with recommendations of the manufacturer.
- .7 Report, to Departmental Representative or Designate in writing, any defects in surfaces or conditions that may adversely affect the performance of products installed under this section, before commencement of work.
- .8 Commencement of work shall be deemed as acceptance of existing work substrates and conditions.

3.2 Application

- .1 Perform spray-application of polyurethane foam in accordance with CANIULC S705.2. Standard for Thermal Insulation Spray Applied Rigid Polyurethane Foam, Medium Density, Installer's Responsibilities.

- .2 Apply only when surfaces and environmental conditions are within limits prescribed by material manufacturer. Refer to technical data sheets.
 - .3 Apply in consecutive passes (min. 15mm, max. 50mm) to obtain the thickness as indicated on drawings.
 - .4 Do not spray closer than 3" (75mm) of sources of heat.
- 3.3 Tolerance
- .1 Apply the product to result of an average (9 readings in 1 m²) +/- 6mm (1/4") of the thickness requirements shown on Drawings.
 - .2 Apply the insulation uniformly in accordance to NBC article 9.25.2.3. 1).

END OF SECTION

PART 1 – GENERAL

- 1.1 Related Work
 - .1 Vapour Retarders Section 07 26 00
- 1.2 Protection
 - .1 Ventilate areas to receive insulation by introducing fresh air and exhausting air continuously during and 24 hours after application to maintain non-toxic, unpolluted, safe working conditions.
 - .2 Provide temporary enclosures to prevent spray from contaminating air beyond application area.
 - .3 Protect adjacent surfaces and equipment from damage by overspray, fall-out, and dusting of insulation materials.
- 1.3 Environmental Requirements
 - .1 Apply insulation only when surfaces and ambient temperatures are within manufacturer's prescribed limits.

PART 2 – PRODUCTS

- 2.1 Materials
 - .1 Insulation: pure cellulose fibres, chemically impregnated to resist mould, mildew and fire, with built-in inorganic water soluble binder which does not react with base surface and adjacent materials.
 - .2 Cellulose fibre insulation: to CGSB 51-GP-60M.

PART 3 – EXECUTION

- 3.1 Application
 - .1 Apply insulation to clean dry surfaces.
 - .2 Pour, pack or pneumatically place loose fibre insulation above ceiling between joists to provide minimum thermal resistance value R-40 and as indicated.
 - .3 Ensure roof areas exposed to outside air are insulated.
 - .4 Ensure unobstructed air circulation to eave vents.
 - .5 Install baffles [as indicated] to prevent insulation from spilling over top of exterior wall and causing blockage of soffit vents, and to prevent displacement of insulation by wind entering vents.
 - .6 Keep insulation minimum 75 mm from heat emitting devices such as recessed light fixtures, and minimum 50 mm from sidewalls of CAN4-S604 type A chimneys and CAN/CGA-B149.1 and CAN/CGA-B149.2 type B and L vents.
- 3.2 Inspection
 - .1 Ensure that ceiling space is not obstructed.

END OF SECTION

PART 1 - GENERAL

- 1.1 Related Work
 - 1. Blanket Insulation Section 07 21 23

- 1.2 References
 - .1 CAN/CGSB-51.33-M80 Vapour Barrier, Sheet, for Use in Building Construction.

PART 2 - PRODUCTS

- 2.1 Sheet Vapour Barrier
 - .1 Polyethylene film: to CAN/CGSB-51.33, Type 1, 6 Mil thick.

- 2.2 Accessories
 - .1 Joint sealing tape: air resistant pressure sensitive adhesive tape, type recommended by vapour barrier manufacturer, 50 mm wide for lap joints and perimeter seals, 25 mm wide elsewhere.
 - .2 Sealants: refer to Section 07900.
 - .3 Staples: minimum 6 mm leg.
 - .4 Moulded box vapour barrier: factory-moulded polyethylene box for use with recessed electric switch and outlet device boxes.

PART 3 - EXECUTION

- 3.1 Installation
 - .1 Install sheet vapour barrier on warm side of exterior wall ceiling and floor assemblies prior to installation of gypsum board to form continuous barrier.
 - .2 Use sheets of largest practical size to minimize joints.
 - .3 Inspect sheets for continuity. Repair punctures and tears with sealing tape before work is concealed.
 - .4 Install sheet vapour barrier on prepared grade for crawl space as noted on drawings.

- 3.2 Exterior Surface Openings
 - .1 Cut sheet vapour barrier to form openings and ensure material is lapped and sealed to frame.

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

3.4 Lap Joint Seals

- .1 Seal lap joints of sheet vapour barrier as follows:
 - .1 Attach first sheet to substrate.
 - .2 Apply continuous bead of sealant over solid backing at joint.
 - .3 Lap adjoining sheet minimum 150 mm (6") and press into sealant bead.
 - .4 Install staples through lapped sheets at sealant bead into wood substrate.
 - .5 Ensure that no gaps exist in sealant bead. Smooth out folds and ripples occurring in sheet over sealant.

3.5 Electrical Boxes

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

END OF SECTION

PART 1 GENERAL

1.1 RELATED WORK SPECIFIED ELSEWHERE

- .1 Section 07 60 00 Flashing and Sheet Metal
- .2 Section 06 10 00 Rough Carpentry

1.2 INTENT

- .1 To provide all materials and labour for the complete, first class installation of wood shingling as called for on the Drawings and specified herein.

1.3 QUALIFICATION

- .1 The roofing applicator and his personnel shall be of recognized standing in the industry, with a proven record of satisfactory installation.

1.4 SAMPLES

- .1 Provide typical "mock-up" panel of wood shingle courses for approval by the Departmental Representative or Designate.

1.5 STORAGE

- .1 Provide a platform so that the first layer of bundles or loose shingles will not be in contact with the ground.
- .2 Use boards to cover the top of the pile to keep out rain and prevent over-drying of the bundles or loose shingles of the top layer.

1.6 PROTECTION

- .1 Workmen to wear soft-soled shoes while applying shingles and under no circumstances wear hob-nailed or caulked footwear.
- .2 If it is essential to walk over the roof for any purpose, boards are to be used for a walkway.
- .3 Scaffolding, toe holds, shingling stools, applicators' platforms and other apparatus employed by the applicator should, when removed, leave little or no trace of its presence and in no way compromise the weather tightness of the roof.
- .4 Protect the roof from damage during construction and the interior from precipitation during construction with full system of "tarps" etc.

PART 2 PRODUCTS

2.1 SHINGLES

- .1 Shall be Western Red Cedar Certigrade shingles No. 1 Blue Label Shingles i.e. 100% heartwood, 100% clear, 100% edge grain.
- .2 Shall be 1/16" at the point and 2/5" at the butt.
- .3 Shall be of random widths with a minimum width of 4" and a max. width of 10".
- .4 Shall be 18" in length.

2.2 EAVE PROTECTION

- .1 `ICE AND WATER SHIELD' at eaves and all other critical areas.i.e. flashing areas Note: Where `ICE AND WATER SHIELD' is used below metal flashings the two materials must be separated by a layer of rosin paper or `dry sheathing'-`ARCTIC PAPER'

2.3 MOSS CONTROL STRIPS

- .1 Purpose made 99% pure zinc flashing strip to inhibit the growth of moss and fungus, (2-5/8" x 50' rolls complete with compatible fasteners), Moss Boss Zinc Strip Model No. 3000 by Peak Products Manufacturing Inc (Canada).

2.4 FASTENERS

- .1 Stainless steel type 304 or 316 roofing nails min. 1-1/4" length or aluminum or hot dipped galvanized roofing nails.

2.5 SEALANT

- .1 Polyurethane-based sealant i. e. Sikaflex 1A meeting Cgsb 16 M Type 2.

PART 3 EXECUTION

3.1 PREPARATION

- .1 Check job dimensions and extent of work as noted on the Drawings and notify the Departmental Representative or Designate of any discrepancies.
- .2 Co-ordinate installation with Sheet-metal, Masonry and Carpentry Trades to ensure correct and timely repair of deck, chimneys, rafters, purlins and trusses, parapets and installation of flashings.

3.2 STRIPPING OFF

- .1 Remove existing roofing and flashings and underlay and expose sheathing.
- .2 Withdraw all existing nails, cleats etc., setting those which break off. Leave surfaces free from dirt and loose material.

3.3 ROOF APPLICATION

- .1 Install shingles over dry, sound substrate. Repair sheathing as required.
- .2 Spacing
 - .1 Provide 1/4" joint between shingles over 5" wide.
 - .2 Provide 1/8" joint between shingles under 5" wide.
- .3 Joints
 - .1 Stagger joints min. 1-1/2" in succeeding courses.
- .4 Nailing
 - .1 Use 2 nails per shingle spacing nail 3/4" from edge with additional nails 4" apart across face of shingle and 1-1/2" above butt line of following course.
 - .2 Bottom shingles of the double starter course to have additional line of nailing 1/2" back from overhang. Spacing to be similar to that of typical roof course.
 - .3 Extra nailing shall be provided at final course of shingles at ridge.
 - .4 Drive nails flush but do not crush shingles.

3.4 SHINGLE ROOFING

- .1 Starter course
 - .1 Double shingles at eaves.
 - .2 Project butts 1-1/2" from first sheathing board.
- .2 Typical Course
 - .1 Install shingles with 5-1/2" weather exposure and having a double thickness of shingles at any given point.

- .3 Finishing the ridge and hips
 - .1 Finish ridges and hips with Boston method consisting of 6" wide shingles over shingle courses with lead shingle alternating from side to side and bevelled. Below concealed hot-dipped galvanized flashing, rosin paper and 'ICE AND WATER SHIELD'.

END OF SECTION

PART 1-GENERAL

- 1.1 Work Included
 - .1 Provide firestopping at penetrations through wall and floor assemblies as shown on Drawings and specified herein.
 - .2 Firestopping shall be done by one trade experienced in the use of the applicable materials and standards.
- 1.2 Submittals
 - 1. Submit details of firestopping and ULC 45 minute fire separation system references in accordance with Section 01 33 00 - Submittals.
 - .2 Submit manufacturer's product data for each product utilized.
- 1.3 Testing
 - .1 All systems used for firestopping shall be tested and pass CAN4-S 1 15 for the use intended. Firestop systems must be installed in overall assemblies which pass CAN4-S 1 01.

PART 2 - PRODUCTS

- 2.1 Firestop System: Equal to Dow Corning "Fire-bloc" Firestop System or other approved by Double AD or 3M. System shall include:
 - .1 Firestop Sealant #2000 or Fire-bloc 3-50: One part silicone elastomer.
 - .2 Firestop Foam #2001: Two part silicone elastomer.
 - .3 Intumescent Wrap Strip #2002: Expanding wrapping for piping in penetrations.
 - .4 Mineral Wool Insulation: Equal to Roxul as specified in Section 07 21 13 or Fire-bloc 1 preformed firestopping.

PART 3 -EXECUTION

- 3.1 Installation Assemblies
 - .1 For plumbing simple cable systems, conduit installed through sleeves: Sealant #2000 and floor/wall penetration detail #129.
 - .1 Butter sealant into joint and spread with putty knife.
 - .2 For multiple cables, multiple conduit and pipes and mixtures of cables and pipes: Sealant #2001 and floor penetration detail #1 14.
 - 1 Mix liquid A and B components on site and install to manufacturer's instructions.
 - .3 Others as required by field conditions and as recommended by material manufacturer.
- 3.2 Preparation
 - 1 Clean substrate penetrations of contaminants and impurities and loose materials. Clean metal surfaces with an oil-free absorbent cloth saturated with xylol or toluol (observe all safety precautions regarding ventilation, protection of exposed skin, protection from heat & sparks).
 - .2 Mask areas around penetration to provide a neat appearance where areas are exposed to view. Remove masking immediately after tooling.

3.3 Installation

- 1 Install sealant. Self leveling sealant opening must be dammed to prevent leakage. Use rock wool (Roxul) to dam opening. Apply thickness of sealant to meet specified fire resistance rating for opening.
- .2 Tool non-leveling sealants to a smooth finish.
- .3 Clean up around work.

END OF SECTION -

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

1. Division One, General Requirements, is a part of this Section and shall apply as if repeated here.

1.2 ENVIRONMENTAL CONDITIONS

1. Sealant and substrate materials to be minimum 5°C (40°F).
2. Should it become necessary to apply sealants below 5°C, consult manufacturer and follow their recommendations.

1.3 WARRANTY

1. Provide a written warranty signed and issued in the name of the Client and Project stating the caulking work will not crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces in accordance with GC 12.3, as amended by the Supplementary General Conditions, but for a period of three years.

PART 2 - PRODUCTS

2.1 MATERIALS

1. Primers: Type recommended by sealant manufacturer.
2. Joint fillers:
 1. General: Compatible with primers and sealants, outsized 30 to 50%.
 2. Polyethylene, urethane, neoprene or vinyl: Extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.
3. Bond breaker: Pressure sensitive plastic tape, not bondable to sealants.
4. Sealants
 1. Type 1: In locations except where indicated otherwise below;
one component to CGSB/CAN-19.13-M87, Class MCG-2-25-B-N,
 1. CSL Silicones Inc. **343**
 2. Sikaflex **15LM**
 3. Dow Corning Canada Inc. **795**
 4. Sonneborn ChemRex Inc. **Sonolastic**
 5. Tremco **Spectrem 2**
 2. Type 2: For use at horizontal traffic joints:
 1. Master Builders **Isoflex**
 2. Tremco **THC900**
 3. Sikaflex **ICSL**
 3. Type 3: For use in areas of high moisture including washrooms, kitchens, change rooms, custodial areas to CGSB/CAN-19GP22M;
 1. Canadian General Electric **Sanitary Sealant SCS 1700**
 2. C.S.L. Silicones Inc. **302**
 3. Dow Corning Canada Inc. **786**
 4. Tremco **Tremsil 200**
 4. Type 4: For use in windows and glazing;
 1. Canadian General Electric **Silglaze-SCS 2501**
 2. Dow Corning Canada Inc. **999**

3. C.S.L. Silicones Inc. **302**
4. Tremco **Tremsil 200**
5. Type 5: For use where acoustical sealant is required;
 1. Tremco **Acoustical Sealant**
 2. Presstite **Acoustical Sealant No. 579-64**
6. Type 6: For use where painting of caulking is required and only in non-moving construction joints. Example; where wall surfaces meet interior door frames:
 1. Dow Corning **8644 Paintable Sealant**
 2. Tremco **Dymonic**
 3. Sikaflex **15LM**
5. Colour(s) of sealants: To be selected by Departmental Representative or Delegate from standard colours.
6. Joint cleaner: Xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.
7. Vent tubing: 3mm (0.125") inside diameter extruded polyvinyl chloride tubing.

PART 3 - EXECUTION

3.1 PREPARATION

1. Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.
2. Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.
3. Remove oil, grease and other coatings from non-ferrous metals with joint cleaner.
4. Prepare concrete, masonry, glazed and vitreous surfaces to sealant manufacturer's instructions.
5. Examine joint sizes and correct to achieve depth ratio $\frac{1}{2}$ of joint width with minimum width and depth of 6mm (0.25"), maximum width 25mm (1").
6. Install joint filler to achieve correct joint depth.
7. Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.
8. Apply bond breaker tape where required to manufacturer's instructions.
9. Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

3.2 APPLICATION

1. Apply sealants, primers, joint fillers, bond breakers to manufacturer's instructions. Apply sealant using gun with proper size nozzle. Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.
2. Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities. Neatly tool surface to a slight concave joint.
3. Apply sealant to joints between all dissimilar materials, around perimeter of every external opening unless specified otherwise, to control and expansion joints in masonry and concrete walls, to joints where built-ins meet adjacent building elements (by Section 06240), to perimeters of interior window sills, to perimeters of hollow metal screen including interior floor junctures, to drywall edge mold / and adjacent building elements, to aggregate panel joints and perimeters and where indicated.
4. In masonry cavity construction, vent caulked joints from cavity to 3mm (0.125") beyond

external face of wall by inserting vent tubing at bottom of each joint and maximum of 1500mm (5'-0") o.c. vertically. Position tube to drain to exterior.

5. Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after tooling of joints.
6. Supply and application of sealant to joints between aluminum window, sloped aluminum, curtain wall, or aluminum door frames to adjacent interior and exterior building components, shall be by aluminum window and aluminum frame respective sections.

END OF SECTION

PART 1 - GENERAL

1.1 SECTION INCLUDES

- .1 Wood single hung, complete with hardware, glazing, weather strip, insect screen, Authentic Divided Lite, jamb extension and standard or specified anchors, trim, and attachments.

1.2 RELATED SECTIONS

- .1 Section 01 33 23—Submittal Procedures: Shop Drawings, Product Data, and Samples
- .2 Section 01 62 00—Product Options
- .3 Section 01 65 00—Product Delivery
- .4 Section 01 66 00—Storage and Handling Requirements
- .5 Section 01 71 00—Examination and Preparation
- .6 Section 01 73 00—Execution
- .7 Section 01 74 00—Cleaning and Waste Management
- .8 Section 01 76 00—Protecting Installed Construction
- .9 Section 06 22 00—Millwork: Wood trim other than furnished by window manufacturer
- .10 Section 07 92 00—Joint Sealants: Sill sealant and perimeter caulking
- .11 Section 09 90 00—Paints and Coatings: Paint or stain other than factory applied finish

1.3 REFERENCES

- .1 American Society for Testing and Materials (ASTM):
 1. E 283: Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
 2. E 330: Standard Test Method for Structural Performance of Exterior Windows, Curtains Walls, and Doors by Uniform Static Air Pressure Difference.
 3. E 547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 4. E 774: Specification for Sealed Insulated Glass Units.
 5. C 1036: Standard Specification for Flat Glass.
- .2 American Architectural Manufactures Association / Window and Door Manufactures Association (AAMA / WDMA): ANSI / AAMA / NWWDA 101 / I.S.2-97 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors; 101 / I.S.2 / NAFS-02 Voluntary Performance Specification for Windows, Skylights and Glass Doors; AAMA/WDMA/CSA 101/I.S.2/A440-05 Standard/Specification for Windows, Doors, and Unit Skylights; AAMA/WDMA/CSA 101/I.S.2/A440-08 NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights
- .3 Sealed Insulating Glass Manufactures Association / Insulating Glass Certification Council (SIGMA / IGCC).
- .4 National Fenestration Rating Council (NFRC): 101: Procedure for Determining Fenestration Product Thermal Properties.

1.4 SYSTEM DESCRIPTION

- .1 Design and Performance Requirements:
 1. Window units shall be designed to comply with ANSI / AAMA / NWWDA 101 / I.S.2-97 and 101 / I.S. 2/ NAFS-02:
 - a. Double Hung / Single Hung: (H-LC40 rating up to CN 3036, CN 4026) (H-LC30 rating up to CN 4036)

2. Air leakage shall not exceed the following when tested at 1.57 psf according to ASTM E 283: .30 cfm per square foot of frame.
3. No water penetration shall occur when units are tested at the following pressure according to ASTM E 547: (H-LC40 - 6.0) (H-LC30 - 4.5) (TR-LC40 - 6.0) (F-LC40 - 6.0) psf.
4. Assembly shall withstand the following positive or negative uniform static air pressure difference without damage when tested according to ASTM E 330: (H-LC40 - 60) (H-LC30 - 45) (TR-LC40 - 60) (F-LC40 - 60) psf.

1.5 SUBMITTALS

- .1 Shop Drawings: Submit shop drawings under provisions of Section 01 33 23.
- .2 Product Data: Submit catalog data under provisions of Section 01 33 23.
- .3 Samples:
 1. Submit corner section under provisions of Section 01 33 23.
 2. Include glazing system, quality of construction, and specified finish.
- .4 Quality Control Submittals: Submit manufacture's certifications indicating compliance with specified performance and design requirements under provisions of Section 01 33 23.

1.6 DELIVERY

- .1 Comply with provisions of Section 01 65 00.
- .2 Deliver in original packaging and protect from weather.

1.7 STORAGE AND HANDLING

- .1 Prime or seal wood surfaces, including surface to be concealed by wall construction, if more than thirty (30) days will expire between delivery and installation.
- .2 Store window units in an upright position in a clean and dry storage area above ground and protect from weather under provisions of Section 01 66 00.

1.8 WARRANTY

- .1 Windows shall be warranted to be free from defects in manufacturing, materials, and workmanship for a period of ten (10) years from purchase date.
- .2 Insulating glass shall be warranted against visible obstruction through the glass caused by a failure of the insulating glass air seal for a period of twenty (20) years from the date of original purchase.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

- .1 Description: Wood Single Hung, as manufactured by Marvin Windows and Doors, Warroad, Minnesota or equivalent to match existing profile and sizing at the site.

2.2 FRAME DESCRIPTION

- .1 Finger jointed edge-glued pine, finger jointed, edge-glued Douglas fir, mahogany, vertical grain Douglas fir head and side jambs with interior clear veneer, finger jointed (clear) sill.
 1. Kiln dried to a moisture content no greater than twelve (12) percent at the time of fabrication.
 2. Water repellent preservative treated in accordance with WDMA I.S.4.
- .2 Frame thickness: 1 1/16 inch (17 mm) head and side jambs, 1-7/16 inches (37 mm) at sill.

- .3 Frame width: 4-9/16 inches (116 mm).

2.3 SASH DESCRIPTION

- .1 Clear pine; Douglas fir, mahogany; vertical grain Douglas fir.
 - .1 Kiln dried to a moisture content no greater than twelve (12) percent at the time of fabrication.
 - .2 Water repellent preservative treated in accordance with WDMA I.S.4.
- .2 Sash thickness: 1-5/8 inches (41 mm) for double hung, 1-5/8 inches (41 mm) or 2 inches (51 mm) for picture units.
- .3 Removable exterior glazing stops.

2.4 GLAZING

- .1 Select quality complying with ASTM C 1036. Insulating glass SIGMA / IGCC certified to performance level CBA when tested in accordance with ASTM E 774.
- .2 Glazing method: Single glazed; Single glazed with energy panel; Insulated glass for operators is 11/16" (17 mm), 5/8" for ADL, 7/8" for Tri-pane (Altitude adjusted).
- .3 Glass Type: Clear.
- .4 Glazing Seal: Silicone bedding.

2.5 FINISH

- .1 Interior / Exterior: Treated bare wood; Latex prime coat, white.
- .2 Painted Interior Finish: per Painting 09 92 23.

2.6 HARDWARE

- .1 Balance system: Coil spring block and tackle with nylon cord and fiber filled nylon clutch.
- .2 Jamb carrier: Vinyl extrusion with wood inserts. Color: Beige.
- .3 Lock: High pressure zinc die-cast cam lock and keeper.
 - 1. Finish: Antique Brass.

2.7 WEATHER STRIP

- .1 Continuous leaf weather strip at head jamb parting stop; dual durometer bulb weather strip at check rail; foam bulb type dual durometer weather strip on vertical sash edge; dual durometer bulb weather strip at bottom rail. Color: Beige.

2.8 JAMB EXTENSION

- .1 Factory installed jamb extension for wall thickness indicated or required.
- .2 Finish: Match interior frame finish.

2.9 HEAD / SEAT BOARD

- .1 Factory installed head board / seat board for wall thickness indicated or required.
- .2 Finish: Match interior finish.

2.10 AUTHENTIC DIVIDED LITES (ADL)

- .1 7/8 inch (22 mm) single glaze muntin; 1-11/16 inches (43 mm) insulating glass muntin.
 - 1. Pattern: Rectangular; Custom lite layout to match existing.
 - 2. Finish: Match sash finish.

2.11 ACCESSORIES AND TRIM

- .1 Installations and Hardware Accessories:
 - .1 Installation brackets: 6-3/8 inches (162 mm)
 - .2 Masonry brackets: 6 inches (152 mm); 10 inches (254 mm).
 - .3 Sash lifts: High pressure zinc die-cast. Color: Brass.
- .2 Exterior Wood Moulding:
 - .1 Profile: Brick mould casing as indicated on drawings.
 - .2 Finish: Match exterior frame finish.

PART 3 EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: Before Installation, verify openings are plumb, square, and of proper dimension as required in Section 01 71 00. Report frame defects or unsuitable conditions to the General Contractor before proceeding.
- .2 Acceptance of Conditions: Beginning of installation confirms acceptance of existing conditions.

3.2 INSTALLATION

- .1 Comply with Section 01 73 00.
- .2 Assemble and install window unit according to manufacturer's instructions and reviewed shop drawings.
- .3 Install sealant and related backing materials at perimeter of unit or assembly in accordance with Section 07 92 00 Joint Sealants. Do not use expansive foam sealant.
- .4 Install accessory items as required.
- .5 Use finish nails to apply wood trim and mouldings.

3.3 CLEANING

- .1 Remove visible labels and adhesive residue according to manufacture's instructions.
- .2 Leave windows and glass in a clean condition. Final cleaning as required in Section 01 74 00.

3.4 PROTECTING INSTALLED CONSTRUCTION

- .1 Comply with Section 01 76 00.
- .2 Protect windows from damage by chemicals, solvents, paint, or other construction operations that may cause damage.

3.5 SEALANT

- .1 Apply sealant in accordance with Section 07 92 10 Joint Sealing.

END OF SECTION

PART 1-GENERAL

- 1.1 Summary of Work
 - .1 Provide new plaster wall finishes and plaster repairs as shown.
- 1.2 Related Work
 - .1 Masonry brick infill Section 04 21 13
 - .2 Rough Carpentry Section 06 10 10
 - .3 Gypsum board Assemblies Section 09 21 16
- 1.3 Reference Standards
 - .1 Do plastering work to CSA A82.30-M except where specified otherwise.
- 1.4 Delivery and Storage
 - .1 All materials, except water and sand, shall be delivered in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.
- 1.5 Environmental Conditions
 - .1 Temperature in building shall be maintained in uniform range above 13°C while plastering is executed, and after plaster is dry.

PART 2 -PRODUCTS

- 2.1 Materials
 - .1 Lath: Furnish self-furring galvanized metal lath
 - .2 Screw Fasteners: Furnish corrosion resistant self-tapping screws to secure metal lath to masonry.
 - .3 Steel Framing Components: Roll formed (0.53mm) galvanized steel complying with ASTM C645.
 - .4 Basecoat Plaster: Red Top Two Purpose Plaster by CGC complying with CSA A82.22-M.
 - .5 Finish Coat Plaster: Red Top Finish Hydrate by CGC.
 - .6 Water: potable.
 - .7 Accessories: Provide corner beads, casing beads, control joints, etc, required to properly execute the work.

PART 3 -EXECUTION

- 3.1 Workmanship
 - .1 Apply plaster finish level and plumb to maximum variation of 3mm in 2.5m in any plane.
- 3.2 Preparation
 - .1 Prepare surfaces to receive plaster to CSA A82.30-M.
 - .2 Do not plaster adjacent to other finished work until such work is masked.
 - .3 Apply bonding plaster to masonry surfaces in accordance with manufacturer's instructions.

3.3 Basecoat Application

- .1 Mix basecoat plasters by hand or in a mechanical mixer to uniform consistency following manufacturer's directions. Apply basecoat plaster by hand or machine in 2 coats. moderately wet masonry surfaces that exhibit high suction immediately prior to plastering.
- .2 Over metal lath and masonry, apply basecoat (first coat) with sufficient material and pressure to form good bond to base and to cover well, and then double back to bring plaster out to required thickness. Straighten to a true surface with rod and darby without use of additional water and leave rough to receive second coat.

3.4 Finish Coat Application

- .1 Trowel finish coat: Scratch plaster in thoroughly and immediately double back to fill out to a smooth, dense surface, free of surface blemishes and irregularities. Apply finish coat as thin as possible, preferably 1.5mm to no more than 3mm maximum thickness.

3.5 Patching and Completion

- .1 Point up around trim and other work. Cut out and patch defective and damaged plaster. Patch plaster to match existing work in texture and finish flush and smooth. At completion of finish plaster work, clean all plaster from beads, screeds, metal and metal trim, leaving work ready for painting by Section 09 91 23.
- .2 Remove all plaster rubbish, excess material, scaffolding, tools, and other equipment from the building, leaving floors vacuum clean.

- END OF SECTION -

PART 1 - GENERAL

- 1.1 Related Work
 - .1 Rough carpentry: Section 06 10 10
 - .2 Vapour Retarders: Section 07 26 00
 - .3 Painting: Section 09 91 23
- 1.2 Reference Standards
 - .1 Do work in accordance with CSA A82.31-M1980 except where specified otherwise.

PART 2 - PRODUCTS

- 2.1 Gypsum Board
 - .1 Standard board: to CSA A82.27-M1977 regular, 12.7 mm thick and Type 'X', 15.8 mm thick, 1200 mm wide x maximum practical length, ends square cut, edges squared.
 - .2 Water resistant board: to CSA A82.27-M1977 regular, 12.7 mm thick and Type 'X', 15.8 mm thick, 1200 mm wide x maximum practical length.
- 2.2 Metal Furring and Suspension Systems
 - .1 Metal furring runners, hangers, tie wires, inserts, anchors: to CSA A82.30-M1980, galvanized.
 - .2 Drywall furring channels: 0.5 mm core thickness galvanized steel channels for screw attachment of gypsum board.
 - .3 Resilient clips and drywall furring: 0.5 mm base steel thickness galvanized steel for resilient attachment of gypsum board.
- 2.3 Fastenings and Adhesives
 - .1 Nails, screws and staples: to CSA A82.31- M1980.
 - .2 Stud adhesive: to CGSB 71-GP-25M-77.
 - .3 Laminating compound: as recommended by manufacturer, asbestos-free.
- 2.4 Accessories
 - .1 Casing beads, corner beads fill type: 0.5 mm base thickness commercial grade sheet steel with Z275 zinc finish to ASTM A525-86, perforated flanges; one piece length per location.
 - .2 Acoustic sealant: to CAN/CGSB-19.21-M87.
 - .3 Polyethylene: to CAN/CGSB-51.33-M89, Type 2.
 - .4 Insulating strip: rubberized, moisture resistant, 3 mm thick closed cell neoprene strip, 12 mm wide, with self sticking permanent adhesive on one face, lengths as required.
 - .5 Joint compound: to CSA A82.31-M1980, asbestos- free.
- 2.5 Finish
 - .1 Texture finish: asbestos-free standard white texture coating and primer-sealer, recommended by gypsum board manufacturer.

PART 3 - EXECUTION

3.1 Suspended and Furred Ceilings

- .1 Erect hangers and runner channels for suspended gypsum board ceilings in accordance with CSA A82.31-M1980 except where specified otherwise.
- .2 Support light fixtures by providing additional ceiling suspension hangers within 150 mm of each corner and at maximum 600 mm around perimeter of fixture.
- .3 Install work level to tolerance of 1:1200.
- .4 Frame with furring channels, perimeter of openings for access panels, light fixtures, diffusers, grilles, etc.
- .5 Install 19 x 64 mm furring channels parallel to, and at exact locations of steel stud partition header track.
- .6 Furr for gypsum board faced vertical bulkheads within termination of ceilings.
- .7 Furr above suspended ceilings for gypsum board fire and sound stops and to form plenum areas as indicated.

3.2 Wall Furring

- .1 Install wall furring for gypsum board wall finishes in accordance with CSA A82.31-M1980, except where specified otherwise.
- .2 Furr openings and around built-in equipment, cabinets, access panels, on four sides. Extend furring into reveals. Check clearances with equipment suppliers.
- .3 Furr duct shafts, beams, columns, pipes and exposed services where indicated.

3.3 Resilient Furring

- .1 Erect drywall resilient furring transversely across studs, spaced maximum 600 mm oc and not more than 150 mm from ceiling/wall juncture. Secure to each support with 25 mm drywall screw.
- .2 Install 150 mm continuous strip of 12.7 mm gypsum board along base of partitions where resilient furring installed.

3.4 Gypsum Board Application

- .1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.
- .2 Apply single layer gypsum board to metal furring or framing using screw fasteners. Maximum spacing of screws 300 mm oc.
- .3 Apply single layer gypsum board to concrete or concrete block surfaces, where indicated, using laminating adhesive.
- .4 Apply water resistant gypsum board where wall tiles coating to be applied and adjacent to slop sinks janitors closets. Apply water- resistant sealant to edges, ends, cut-outs which expose gypsum core and to fastener heads. Do not apply joint treatment on areas to receive tile finish.
- .5 Apply 12 mm diameter bead of acoustic sealant continuously around periphery of each face of partitioning to seal gypsum board/structure junction where partitions abut fixed building components. Seal full perimeter of cut-outs around electrical boxes, ducts, in partitions where perimeter sealed with acoustic sealant.
- .6 Apply gypsum board sheets vertically only. Horizontal joints below finished ceiling height will not be permitted.

3.5 Fire Rated Assemblies

- .1 Construct fire rated assemblies where indicated.

3.6 Accessories

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Make joints tight, accurately aligned and rigidly secured. Mitre and fit corners accurately, free from rough edges. Secure at 150 mm oc.
- .2 Install casing beads around perimeter of suspended ceilings.
- .3 Install casing beads where gypsum board butts against surfaces having no trim concealing junction and where indicated. Seal joints with sealant.
- .4 Install insulating strips continuously at edges of gypsum board and casing beads abutting metal window and exterior door frames, to provide thermal break.

3.7 Control Joints

- .1 Construct control joints of two back-to-back casing beads set in gypsum board facing and supported independently on both sides of joint.
- .2 Provide continuous polyethylene dust barrier behind and across control joints.
- .3 Locate control joints where indicated approximately 10m spacing on long corridor runs at approximate 15 m spacing on ceilings.
- .4 Install control joints straight and true.

3.8 Access Doors

- .1 Install access doors to electrical and mechanical fixtures specified in respective Sections.
- .2 Rigidly secure frames to furring or framing systems.

3.9 Taping and Filling

- .1 Finish face panel joints and internal angles with joint system consisting of joint compound, joint tape and taping compound installed according to manufacturer's directions and feathered out onto panel faces.
- .2 Finish corner beads, control joints and trim as required with two coats of joint compound and one coat of taping compound, feathered out onto panel faces.
- .3 Fill screw head depressions with joint and taping compounds to bring flush with adjacent surface of gypsum board so as to be invisible after surface finish is completed.
- .4 Sand lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .5 Completed installations to be smooth, level or plumb, free from waves and other defects and ready for surface finish.

END OF SECTION

PART 1 -GENERAL

- 1.1 Work Included
- .1 Provide porcelain tile floor and base system and cast marble tile finishes as scheduled and specified herein.
- 1.2 Related Work
- .1 Caulking between tile and adjacent substrates Section 07 92 10
- 1.3 Examination
- .1 Prior to commencing, examine the work to verify that R is in conformity to the design drawings. Where problems occur consult with the Departmental Representative or Designate prior to proceeding.
- 1.4 Reference Standards
- .1 Do tile work in accordance with Installation Manual 200-1979, "Ceramic Tile", produced by Terrazzo Tile and Marble Association of Canada (TTMAC), except where specified otherwise.
- 1.5 Submittals
- .1 Submit manufacturers data on each product specified herein.
 - .2 Submit shop drawings for layouts indicating tiles and trim pieces.
- 1.6 Maintenance Material
- .1 Provide minimum 2% of each type and colour of tile required for project for maintenance use. Store where directed by Owners Representative.
 - .2 Maintenance material to be of same production run as installed material.
- 1.7 Environmental Conditions
- .1 Maintain air temperature and structural base temperature at tile installation area above 10 deg for 24 hours before, during and 24 hours after installation.

PART 2 - PRODUCTS

- 2.1 Washroom Ceramic Tile:
- .1 Walls: Alba Collection
 - Size: 150mm x 203mm (6"x8").
 - Colour: QT.AL.BGE.0608, with co-ordinating grout.
 - Supplied by Olympia Tile.
- 2.4 Grout and Adhesive Materials
- .1 Furnish thin-set mortar and adhesive grout as specified herein.
 - .2 Water: potable and free of minerals which may discolour mortar.
- 2.5 Sealant
- .1 Furnish single component urethane Sika "Sikaflex 1a" or equivalent for sealing control joints within ceramic tile systems.

2.6 Leveling Coat

- .1 Furnish field mixed leveling coat composed of 1 part CAN 3-A5-M Type 10 Portland cement, 4 parts masonry sand, 1/10th part latex additive plus water.

PART 3 - EXECUTION

3.1 Preparation of Surfaces

- .1 Surfaces to receive tile shall be thoroughly clean, dry and sound. Remove all oil, was grease, dirt, paint and other foreign material from substrates by sanding or other suitable methods.
- .2 Substrates shall be sound, level and plumb, within a maximum tolerance of 3mm (1/8") in 2400mm (8'-0") for vertical surfaces, and horizontal surfaces within a maximum tolerance of 6mm (1/4") in 3000mm (10'-0") from finished levels of the surface.
- .3 Apply leveling coat on uneven surfaces, or surfaces which are not within tolerances specified.
- .4 Maintain temperatures to minimum of 100C during installation and until mortar and grout have properly cured.
- .5 Clean and fill substrate shrinkage control joints flush with latex-cement compound specified for leveling coat.

3.2 Installation

- .1 Field mix and apply setting beds and grout per manufacturers instructions.
- .2 Apply tile to clean and sound surfaces.
- .3 Cut and fit tile around corners, fitments, fixtures, drains and other built-in objects. Maintain uniform joint appearance. Cut edges smooth and even.
- .4 Maximum surface tolerance 1:800.
- .5 Make joints between tile uniform and approximately 3mm (1/8") wide, plumb, straight, true, even and flush with adjacent tile.
- .6 Lay out tiles so perimeter tiles are minimum 1/2 size.
- .7 Sound tiles after setting and replace hollow - sounding units to obtain full bond.
- .8 Make internal angles square, external angles bull nosed.
- .9 Provide divider strips at junction of tile flooring and dissimilar materials.
- .10 Allow minimum 48 hours after installation of tiles, before grouting.
- .11 Provide 6mm (1/4") deep raked sealant control joint between wall tile coved base unit and floor tile. Fill joint with sealant after grout has cured.
- .12 Clean installed tile surfaces after installation and grouting is cured. Use only cleaning products and procedures as recommended by tile and grout manufacturer.
- .13 Caulk sealant around piping, fittings, fixtures, and other penetrations through tile.

3.3 Base Tile

- .1 Install tiles on walls in accordance with TTMAC detail No. 200-5.

END OF SECTION

PART 1 - GENERAL

- 1.1 Related Sections
- .1 Section 01 33 00 - Submittal Procedures.
 - .2 Section [01 74 21 - Construction/Demolition Waste Management And Disposal.
 - .3 Section [01 78 00 - Closeout Submittals].
- 1.2 References
- .1 American Society for Testing and Materials (ASTM International)
 - .1 ASTM D 1055-[97], Specification for Flexible Cellular Materials - Latex Foam.
 - .2 ASTM D 1335-[98], Tuft Bind of Pile Floor Coverings.
 - .3 ASTM D 1667-[97], Standard Specification for Flexible Cellular Materials-Vinyl Chloride Polymers and Copolymers (Closed-Cell Foam).
 - .4 ASTM D 3936-[00] Standard Test Method for Resistance to Delamination of the Secondary Backing of Pile Yarn Floor Covering.
 - .5 ASTM D 5252-[98a], Standard Practice for the Operation of the Hexapod Drum Tester.
 - .6 ASTM D 5417-[99], Standard Practice for Operation of the Vettermann Drum Tester.
 - .7 ASTM E 84-[01], Test Method for Surface Burning Characteristics of Bulding Materials.
 - .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-4.2 No.27.6-[M91], Textile Test Methods - Flame Resistance - Methemine Tablet Test for Textile Floor Coverings.
 - .2 CAN/CGSB-4.2 No.77.1-[94]/ISO 4919:1978, Textile Test Methods - Carpets - Determination of Tuft Withdrawal Force.
 - .3 CGSB 4-GP-36M-[78], Carpet Underlay, Fiber Type.
 - .4 CAN/CGSB-4.129-[93(R1997)], Carpets for Commercial Use.
 - .5 CGSB 20-GP-23M-[78], Cushion, Carpet, Flexible Polymeric Material.
 - .6 CAN/CGSB-25.20-[95], Surface Sealer Floors.
 - .4 Carpet and Rug Institute (CRI)
 - .1 CRI-104-[96], Standard Installation of Commercial Carpet.
 - .2 IAQ Carpet Testing Program.

- .5 National Floor Covering Association (NFCA)
 - .1 Floor Covering Specification Manual [1998].
- .6 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S102-[88(R2000)], Surface Burning Characteristics of Building Materials and Assemblies.
 - .2 CAN/ULC-S102.2-[88(R2000)], Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.

1.3 Submittals

- .1 Submit control submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit verification to demonstrate compliance with CAN/ULC S102.
- .3 Submit proof that carpet has been tested and passed the Indoor Air Quality (IAQ) Carpet Testing Program requirements of the Carpet and Rug Institute (CRI) and the Canadian Carpet Institute (CCI).
- .4 Submit report verifying that tuft bind meets requirements of CAN/CGSB-4.129 when tested to CAN/CGSB-4.2 No.77.1.
- .5 Submit report outlining proposed dust control measures.
- .6 Submit carpet schedule using same room designations indicated on drawings.
- .7 Submit carpet manufacturer's installation instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.4 Product Data

- .1 Submit product data in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit product data sheet for each carpet, undercushion, adhesive, carpet protection and subfloor patching compound.
- .3 Submit WHMIS MSDS - Material Safety Data Sheets acceptable to Labour Canada and Health Canada for carpet adhesive and seam adhesive. Indicate VOC content.
- .4 Submit data on specified products, describing physical and performance characteristics, sizes, patterns, colours, and methods of installation.

- 1.5 Shop Drawings
- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate locations and lengths of seams for carpeted areas.
 - .3 Indicate nap direction, open edges, special patterns, and other details required by Departmental Representative or Designate to clarify work.
 - .4 Submit drawings showing columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required as well as direction of carpet pile and pattern, location of edge moldings and edge bindings to Departmental Representative or Designate for review prior to installation of carpet.
- 1.6 Samples
- .1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Submit duplicate 675 x 900 mm pieces of carpet specified, 150 mm lengths of carpet gripper and binder bars and divider strips.
- 1.7 Closeout Submittals
- .1 Submit operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
 - .2 Submit maintenance data: Include maintenance procedures, recommendations for maintenance materials and equipment, and suggested schedule for cleaning.
- 1.8 Qualifications
- .1 Installer Qualifications:
 - .1 Flooring contractor requirements.
 - .1 Specialty contractor normally engaged in this type of work, with prior experience in installation of these types of materials.
 - .2 Certified by carpet manufacturer prior to bid submission.
 - .3 Must not sub-contract labour without written approval of Departmental Representative or Designate.
 - .2 Be responsible for proper product installation, including floor testing and preparation as specified and in accordance with carpet manufacturers written instructions.
- 1.9 Regulatory
- .1 Prequalification: tested to CAN/CGSB-4.2-No.27.6.

Requirements

- .2 Indoor Air Quality: compliance with CRI/CCI Green Label Indoor Air Quality Program, CRI/CCI-IAQ requirements for maximum total volatile chemicals released into air. Label each carpet product with CRI/CCI-IAQ label.
- 1.10 Delivery, Storage and Handling
- .1 Label packaged materials. For carpet tile products indicate nominal dimensions of tile and indicate installation direction.
- .2 Store packaged materials in original containers or wrapping with manufacturer's seals and labels intact.
- .3 Store carpeting and accessories in location as directed by Departmental Representative or Designate. Store carpet and adhesive at minimum temperature of 18° C and relative humidity of maximum 65% for minimum of 48 hours before installation.
- .4 Prevent damage to materials during handling and storage. Keep materials under cover and free from dampness.
- .5 Store materials in area of installation for minimum period of 48 hours prior to installation.
- .6 Modular carpet: store on pallet form as supplied by Manufacturer. Do not stack pallets.
- 1.11 Waste Management and Disposal
- .1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with Waste Reduction Workplan.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material for recycling in accordance with Waste Management Plan.
- .4 Vacuum used carpet before removal.
- .5 Maintain possession of removed used carpet.
- .6 Remove used broadloom in large pieces, roll tightly and pack in container. Use effective packing techniques to maximize amount of material in container.
- .7 Sort only clean, dry carpet materials for reclamation. Clean

is defined as carpet free from demolition debris, asbestos contamination, garbage and tack strips.

- .8 Immediately remove used carpet from site and transport to reclamation point.
- .9 Carpet undercushion: provide recycling of carpet padding where locally available or as designated by carpet reclamation program.

1.12 Environmental Requirements

- .1 Moisture: Ensure substrate is within moisture limits and alkalinity limits prescribed by manufacturer. Prepare moisture testing and provide report to Departmental Representative or Designate.
- .2 Temperature: Maintain ambient temperature of not less than 18° C from 48 hours before installation to at least 48 hours after completion of work.
- .3 Relative humidity: Maintain relative humidity between 10 and 65% RH for 48 hours before, during and 48 hours after installation.
- .4 Safety: Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials.
- .5 Ventilation:
 - .1 Provide continuous ventilation during and after carpet application. Run ventilation system during installation; provide continuous ventilation for 7 days after completion of carpet installation.
- .6 Test existing floor levelling compound for presence of asbestos contamination. Notify Departmental Representative or Designate for additional instructions where asbestos is discovered.
- .7 Do not install carpet until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete.

1.13 Extra Materials

- .1 Provide extra materials of carpet, carpet base, and adhesives in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Provide 2.0 m² of each colour, pattern and type of carpeting.
- .3 Extra materials to be from same production run as installed

materials.

- .4 Identify each package of carpet and each container of adhesive.
- .5 Deliver to Departmental Representative or Designate and store where directed by Departmental Representative or Designate.

PART 2 - PRODUCTS

2.1 Manufacturers

- .1 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute IAQ requirements.

2.2 Modular Carpet

- .1 Acceptable material:
 - .1 Centura, product Venture, pattern Venice Murano.
 - .2 Patterns and colours from manufacturers standard range.
 - .3 Carpet Tile Dimensions: 500 x 500 mm.
 - .4 Carpet: to CAN/CGSB-4.129 and as follows:
 - .1 Certified for flammability to Health Canada regulations under "Hazardous Products (Carpet) Regulations", Part II of the Schedule.
 - .2 Maximum flame spread rating 300, maximum smoke developed classification 500, when tested to CAN/ULC-S102.2.
 - .3 Certified to Carpet and Rug Institute's and the Canadian Carpet Institute's IAQ requirements.
 - .5 Construction: fusion bond.
 - .6 Pile Surface Appearance:
 - .1 Multi-level loop: concealed-pile.
 - .7 Pile fibre: to CAN/CGSB-4.129.
 - .1 Nylon: BCF.
 - .1 Type: Aquafil Nylon 6.
 - .8 Yarn Dye Method: 100% solution dyed.
 - .9 Total Weight: 628 g/m³.
 - .10 Colourization: patterned.
 - .11 Colourfastness to light: to [CAN/CGSB-4.2No.18.3.
 - .12 Colour Fastness to Atmospheric Fading: to AATCC 129 and AATCC 23.

- .13 Primary Backing: non-woven.
- .14 Secondary Backing: fibreglass reinforced thermoplastic.
- 2.4 Special Requirements
 - .1 Anti-microbial: to AATCC 174, 99% reduction, 0% growth.
 - .2 Stain resistance: to AATCC 175, 8.
- 2.5 Accessories
 - .1 Base:
 - .1 Resilient base: 100mm high, coved rubber to CAN4.102.2, 1200mm lengths, 2.54mm thickness, including premoulded corner units, standard colours
 - .2 Carpet tackstrips: types recommended by carpet manufacturer.
 - .3 Seaming tape: types recommended by carpet manufacturer for purpose intended.
 - .4 Seaming sealer adhesive: type recommended by carpet manufacturer for purpose intended.
 - .5 Binder bars: aluminum finish.
 - .6 Adhesive: Henry H630 or Tec TA749 or as recommended by the manufacturer.
 - .7 Carpet protection: non-staining heavy duty kraft paper.
 - .9 Concrete floor sealer: to CAN/CGSB-25.20, Type 1.
 - .10 Subfloor patching compound: Portland cement base filler, mix with latex and water to form a cementitious paste.
- PART 3 - EXECUTION
 - 3.1 Demolition
 - .1 Remove and divert carpet for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management And Disposal, and with Waste Reduction Workplan. Coordinate with Departmental Representative or Designate.
 - 3.2 Sub-Floor Treatment
 - .1 Concrete shall be inspected to determine special care required to make it a suitable foundation for carpet. Cracks 3 mm wide or protrusions over 0.8 mm will be filled and

levelled with appropriate and compatible latex patching compound.

- .2 Do not exceed manufacturer's recommendations for patch thickness.
- .3 Large patch areas are to be primed with a compatible primer.
- .4 Concrete substrates shall be cured, clean and dry.
- .5 Concrete substrates shall be free of paint, dirt, grease, oil, curing or parting agents, and other contaminants, including sealers, that may interfere with the bonding of the adhesive.
- .6 Wherever a powdery or porous concrete surface is encountered, a primer compatible with the adhesive shall be used to provide a suitable surface for glue-down installation.

3.3 Preparation

- .1 Prepare floor surfaces in accordance with CRI 104 Standard for Installation of Commercial Carpet.
- .2 Pre-condition carpeting following manufacturer's printed instructions.

3.4 Installation

- .1 Install carpeting using minimum of pieces in one-quarter turned pattern.
- .2 Install in accordance with manufacturer's printed instructions and in accordance with Carpet and Rug Institute Standard for Installation of Commercial Carpet, CRI 104.
- .3 Install carpet after finishing work is completed but before demountable office partitions and telephone and electrical pedestal outlets are installed.
- .4 Finish installation to present smooth wearing surface free from conspicuous seams, burring and other faults.
- .5 Use material from same dye lot. Ensure colour, pattern and texture match within any one visual area. Maintain constant pile direction.
- .6 Adhesive seams and cross-joints. Seam edges must be sealed.
- .7 Fit neatly around architectural, mechanical, electrical and telephone outlets, and furniture fitments, around perimeter

of rooms into recesses, and around projections.

.8 Extend carpet into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.

.9 Install carpet smooth and free of bubbles, puckers, and other defects.

3.5 Carpet
Tackstrips and
Binder Bars

.1 Install carpet grippers at junctions of walls and vertical surfaces. Secure gripper to prevent movement.

.2 Install binder bars at exposed carpet edges and centre under doors in door openings.

3.6 Direct Glue
Down Carpet

.1 Apply adhesive and install carpeting in accordance with manufacturer's written instructions, by direct glue-down method.

3.7 Modular Carpet

.1 Apply acrylic release type adhesive and install modular carpet in accordance with manufacturer's written instructions.

.2 Lay modular carpet with butt seams.

.3 Roll modular carpet with appropriate roller for complete contact of carpet with mill-applied adhesive to sub-floor.

3.8 Base
Installation

.1 Install resilient base cove at junction of floor and wall.

.2 Attach resilient base to wall with adhesive. Neatly fit against floor carpet.

3.9 Protection of
Finished Work

.1 Vacuum carpets clean immediately after completion of installation. Protect traffic areas.

.2 Prohibit traffic on carpet for a period of 24 hours until adhesive is cured.

.3 Install carpet protection to satisfaction of Departmental Representative or Designate.

END OF SECTION

PART 1 GENERAL

1.1 RELATED SECTIONS

- .1 Section 08 14 01 - New Sashes, Frames and Doors.
- .2 Section 08 01 52.91 - Wood Window Restoration.
- .3 Section 06 01 10.91 - Rough Carpentry Restoration.
- .4 Section 08 52 01 - Wood Epoxy Consolidation.
- .5 Section 08 52 02 - Wood Epoxy Patching.
- .6 Section 09 93 01 - Surface Preparation for Wood.

1.2 DESCRIPTION

- .1 The work in this section describes priming and painting for all exterior wood work, and both the interior and exterior faces of windows and entrance doorways.

1.3 DELIVERY AND STORAGE

- .1 Deliver packaged materials in original, unopened, labeled and sealed containers.
- .2 Keep stored materials at a temperature between 50-90 degrees F., and protect from direct sun or inclement weather.

1.4 JOB CONDITIONS

- .1 No painting shall be undertaken if the temperature is expected to fall below 50 degrees F. within the next 48 hours unless a heated enclosure is provided.
- .2 Finishes shall not be applied in direct sunlight.
- .3 Finishes shall be protected from moisture for 48 hours after application.
- .4 Surfaces must be dry, clean, free from dust, grease, oil or other contaminants that will affect the work of this Section.
- .5 Ensure that moisture content of wood is less than 10%.

1.5 PROTECTION

- .1 Use sufficient drop cloths and protective coverings to protect furnishings, work of others and adjacent historic fabric not being painted.
- .2 Remove waste rags from site at the end of each working shift.
- .3 All exterior surfaces shall be protected by the use of polyethylene tents to protect from moisture from the time that surface preparation begins and until painting is about to commence. Once painting begins use breathable tarps through to final painting.

1.6 COLOUR SCHEDULE

- .1 At the exterior assume the use of two contrasting colours.
- .2 At the interior assume one colour.
- .3 Colours and placement will be provided by Departmental Representative or Designate.
- .4 Contractor shall provide as many as three sample panels of the different paint colour(s) and finish(es) for review by Departmental Representative or Delegate. Colours other than white may be custom tints different than those available in standard colour wheels.

PART 2 PRODUCTS

2.1 EXTERIOR

- .1 Primer

- .1 Top of the line alkyd primer by Para, Benjamin Moore, or Pratt & Lambert.
- .2 Top Coats
 - .1 Top of the line alkyd finish coats by same manufacturer as primer.

2.2 INTERIOR

- .1 Primer
 - .1 Top of the line latex primer by Para, Benjamin Moore, or Pratt & Lambert.
- .2 Top Coats
 - .1 Top of the line latex finish coats by same manufacturer as primer.

2.3 OTHER

- .1 Knot sealers, thinners, cleaners, primers, and sealers recommended by the coating manufacturer.
- .2 All materials to be new and top line of manufacturer.

2.4 CAULKING

- .1 For joint between clapboard ends and corner boards top of the line, exterior grade, paintable, acrylic latex caulking.

PART 3 EXECUTION

3.1 GENERAL

- .1 Preparation: see "Section 09 93 01 - Surface Preparation".
- .2 Follow all manufacturers' printed instructions.
- .3 Seal knots.
- .4 Back prime, i.e., back side and end grain, all new material before installation.
- .5 Reinstall hardware once painting is completed.
- .6 Conform with approved samples.

3.2 APPLICATION

- .1 Typically (1) coat primer, two (2) finish coats. Finish and number of coats specified are intended to cover surfaces completely. If they do not, apply further coats until complete coverage is achieved to Departmental Representative or Delegate's approval.
- .2 Apply materials in strict accordance with manufacturer's directions and specifications.
- .3 All primer and finish paint shall be applied by brush.
- .4 After application of first coat, Departmental Representative or Delegate must give approval of colour before second coat application. Contractor shall allow for changes in tint at this stage.
- .5 Finishes shall be uniform in sheen, colour and texture, and free from sags, runs or other defects.
- .6 After application of primer neatly caulk and tool joint at ends of clapboard where they meet corner boards or window/door trim.

3.3 CLEAN UP

- .1 On completion of work, remove surplus material, tools, equipment, and debris from work area to satisfaction of owner.
- .2 Remove excess paint from glass and other adjacent surfaces.

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END OF SECTION

PART 1 - GENERAL

- 1.1 Related Work
 - .1 Summary of Work Section 01 11 00
 - .2 Sitework Demolition: Section 02070
 - .3 Site Grading: Section 02210

- 1.2 References
 - .1 ASTM C117-87, Test Method for Material Finer Than: 0.075 mm Sieve in Mineral Aggregates by Washing.
 - .2 ASTM C136-84a, Method for Sieve Analysis of Fine and Coarse Aggregates.
 - .3 ASTM D698-78, Test Methods for Moisture Density Relations of Soils and Soil Aggregate Mixtures Using 2.49 kg Rammer and 304.8 mm Drop.
 - .4 ASTM D1557-78, Test Methods for Moisture Density Relations of Soils and Soil-Aggregate Mixtures Using 4.54 kg Rammer and 457 mm Drop.
 - .5 CAN/CGSB-8.1-88, Sieves, Testing, Woven Wire, Inch Series
 - .6 CAN/CGSB-8.2-M88, Sieves, Testing, Woven Wire, Metric.

- 1.3 Definitions
 - .1 Rock excavation: excavation of material from solid masses of igneous, sedimentary or metamorphic rock which, prior to its removal, was integral with its parent mass, and boulders or rock fragments having individual volume in excess of 1 m³.
 - .2 Common excavation: excavation of materials of whatever nature, which are not included under definitions of rock excavation including dense tills, hardpan and frozen materials.
 - .3 Topsoil: material capable of supporting good vegetative growth and suitable for use in top dressing, landscaping and seeding.
 - .4 Protection of Existing Features
 - .1 Existing buried utilities and structures:
 - .1 Size, depth and location of existing utilities and structures as indicated are for guidance only. Completeness and accuracy are not guaranteed.
 - .2 Prior to commencing any excavation work, notify applicable owner or authorities, establish location and state of use of buried utilities and structures. Clearly mark such locations to prevent disturbance during work.
 - .3 Confirm locations of buried utilities by careful test excavations.
 - .4 Maintain and protect from damage, water, sewer, gas, electric, telephone and other utilities and structures encountered as indicated. Obtain direction of Consultant before moving or otherwise disturbing utilities or structures.
 - .5 Advise Departmental Representative or Delegate and Utility Company to remove or re-route existing lines in area of excavation. Pay costs for such work.
 - .6 Record location of maintained, re-routed and abandoned underground lines.
 - .2 Existing buildings and surface features:
 - .1 Conduct, with Departmental Representative or Delegate, condition survey of existing buildings, trees and other plants, lawns, fencing,

service poles, wires, rail tracks and paving, survey bench marks and monuments which may be affected by work.

- .2 Protect existing buildings and surface features which may be affected by work from damage while work is in progress and repair damage resulting from work.
- .3 Where excavation necessitates root or branch cutting, do so only as approved by Departmental Representative or Delegate in accordance with Section 02104 - Shrub and Tree Preservation.

1.5 Shoring, Bracing and Underpinning

- .1 Comply with Section 01545 - Safety Requirements and applicable local regulations to protect existing features.
- .2 Engage services of qualified professional engineer who is registered in province of Ontario to design and inspect cofferdams, shoring, bracing and underpinning required for work.
- .3 At least 2 weeks prior to commencing work, submit design and supporting data.
- .4 Design and supporting data submitted to bear the stamp and signature of qualified professional engineer registered in the Province of Ontario.
- .5 Professional engineer responsible for design of temporary structures to submit proof of insurance coverage for professional liability except where engineer is employee of contractor, in which case contractor shall submit proof that work by professional engineer is included in contractor's insurance coverage.

1.6 Protection

- 1 Prevent damage to existing structures, utilities, trees, landscaped areas and site appurtenances which were to remain. Make good any damage.
- .2 Verify locations of utilities at the site and as shown on the drawings prior to commencing any excavation.
- .3 There are significant archaeological resources on site. Archaeologists may be required to monitor work to ensure no archaeological resources are damaged. Refer to section 01 11 00 Summary of Work for requirements. Be aware that work could be stopped in the area where such resources are found and redirected elsewhere until situation is resolved to satisfaction of Departmental Representative or Designate.
- .4 The site is a National Historic Site recognized in Canada and must be treated as such. Excavation beyond the immediate work area as outlined by the Engineer or Site Representative is strictly prohibited. If Roads/Routes require modification, confirm with Site Representative or Designate prior to proceeding. Submit a detailed plan for the construction access roads as well as protection procedures and methods. Contractor is required to prevent damage to site assets and protect as required. These requirements are listed in the project specifications and the general conditions of the contract.
- .5 Present to Site Representative or designate method proposed to ensure acceptable, however, no delays in production will be accepted with regards to protecting assets where greater protection is required.

Roadway/Route damage criteria limit is based on 15cm or six (6) inch depression from finished grade to bottom of depression and no further depression shall be permitted and additional protection will be required.

Sample:

A site protection method of geofabric and granular fill for exterior roadway. Where areas are not protected, traffic loads will be limited to lightweight vehicles ie. Gators, light tracked equipment and pickups. Protection methods and roadway modifications require acceptance by Parks Canada Representative or Designate. Protection to interior of fort will be with timber mats for cranes and heavy equipment and plywood for other vehicles.

PART 2 - PRODUCTS

2.1 Materials

- .1 Type 1 and Type 2 fill:
 - .1 Crushed, pit run or screened stone, gravel or sand consisting of hard durable particles free from clay lumps, cementation, organic material, frozen material and other deleterious materials.
- .2 Gradations to be within limits specified when tested to ASTM C136 and ASTM C117. Sieve sizes to CAN/CGSB-8.1.

<u>Sieve Designation</u>		<u>% Passing</u>	
		<u>Type 1</u>	<u>Type 2</u>
75	mm	-	100
50	mm	-	-
37.5	mm	-	-
25	mm	100	-
19	mm	75-100	-
12.5	mm	-	-
9.5	mm	50-100	-
4.75	mm	30-70	22-85
2.00	mm	20-45	-
0.425	mm	10-25	5-30
0.180	mm	-	-
<u>0.075</u>	<u>mm</u>	<u>3-8</u>	<u>0-10</u>

- .2 Type 3 fill: selected material from excavation or other sources, approved by Engineer for use intended, unfrozen and free from rocks larger than 75 mm, cinders, ashes, sods, refuse or other deleterious materials.
- .3 Shearmat: honeycomb type bio-degradable cardboard 100 mm thick, treated to provide sufficient structural support for poured concrete until concrete cured.

PART 3 - EXECUTION

3.1 Site Preparation

- .1 Remove obstructions, ice and snow, from surfaces to be excavated within limits indicated.
- .2 Cut pavement or sidewalk neatly along limits of proposed excavation in order that surface may break evenly and cleanly in accordance with Section 02070 - Sitework

Demolition and Removal.

3.2 Stripping of Topsoil

- .1 Commence topsoil stripping of areas as indicated after area has been cleared of brush weeds and grasses and removed from site.
- .2 Strip topsoil to depths as indicated. Avoid mixing topsoil with subsoil.
- .3 Stockpile in locations as indicated. Stockpile height not to exceed 1 m.
- .4 Dispose of unused topsoil as directed by Consultant off site.

3.3 Stockpiling

- .1 Stockpile of fill materials on site is not permitted. All excavated materials are to be removed from the site.

3.4 De-watering and Heave Prevention

- .1 Keep excavations free of water while work is in progress.
- .2 Avoid excavation below ground water table if quick condition or heave is likely to occur. Prevent piping or bottom heave of excavations by ground water lowering, sheet pile cut-offs, or other means.
- .3 Protect open excavations against flooding and damage due to surface run-off.
- .4 Dispose of water in a manner not detrimental to public and private property, or any portion of work completed or under construction.
- .5 Submit for Consultant's approval details of proposed de-watering or heave prevention methods, such as dikes, well points, and sheet pile cut-offs.

3.5 Excavation

- .1 Excavate to lines, grades, elevations and dimensions as indicated.
- .2 Remove concrete, masonry, paving, walks and other obstructions encountered during excavation in accordance with Section 02070 - Sitework Demolition and Removal.
- .3 Excavation must not interfere with normal 45° splay of bearing from bottom of any footing.
- .4 Do not disturb soil within branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut roots with sharp axe or saw.
- .5 For trench excavation, unless otherwise authorized by Engineer in writing, do not excavate more than 30 m of trench in advance of installation operations and do not leave open more than 15 m at end of day's operation.
- .6 Dispose of surplus and unsuitable excavated material off site.
- .7 Do not obstruct flow of surface drainage or natural watercourses.
- .8 Earth bottoms of excavations to be undisturbed soil, level, free from loose, soft or organic matter.
- .9 Notify Engineer when bottom of excavation is reached.
- .10 Obtain Engineer approval of completed excavation.
- .11 Remove unsuitable material from trench bottom to extent and depth as directed by Engineer.
- .12 Where required due to unauthorized over- excavation, correct as follows:
 - .1 Fill under bearing surfaces and footings with fill concrete.
 - .2 Fill under other areas with Type 2 fill compacted to minimum of 95% in accordance with Section - 02501 - Corrected Maximum Dry Density.
- .13 Hand trim, make firm and remove loose material and debris from excavations. Where

material at bottom of excavation is disturbed, compact foundation soil to density at least equal to undisturbed soil. Clean out rock seams and fill with concrete mortar or grout to approval of Engineer.

3.6 Fill Types and Compaction

- .1 Use fill of types as indicated or specified below.
 - .1 Exterior side of perimeter walls: Use Type 3 fill to subgrade level. Compact to 95%.
 - .2 Within building area: use Type 2 to underside of base course for floor slabs. Compact to 98%.
 - .3 Under concrete slabs: provide 150 mm compacted thickness base course of Type 1 fill topped with shearmat filler as indicated to underside of slab. Compact base course to 100%.
 - .4 Retaining walls: use Type 2 fill to subgrade level on high side for minimum 500 mm from wall and compact to 95%. For remaining portion, use Type 3 fill compacted to 95%.

3.7 Bedding and Surround of Underground Services

- .1 Place and compact granular material for bedding and surround of underground services as indicated and as specified.

3.8 Backfilling

- .1 Vibratory compaction equipment requires approval.
- .2 Do not proceed with backfilling operations until Consultant has inspected and approved installations.
- .3 Areas to be backfilled to be free from debris, snow, ice, water and frozen ground.
- .4 Do not use backfill material which is frozen or contains ice, snow or debris.
- .5 Place backfill material in uniform layers not exceeding 150 mm compacted thickness up to grades indicated. Compact each layer before placing succeeding layer.
- .6 Backfilling around installations.
 - .1 Place bedding and surround material as specified elsewhere.
 - .2 Do not backfill around or over cast-in- place concrete within 24 h after placing of concrete.
 - .3 Place layers simultaneously on both sides of installed work to equalize loading. Difference not to exceed 250 mm.
 - .4 Where temporary unbalanced earth pressures are liable to develop on walls or other structures:
 - .1 Permit concrete to cure for minimum 14 days or until it has sufficient strength to withstand earth and compaction pressure and approval obtained from Engineer or:
 - .2 If approved by Engineer, erect bracing or shoring to counteract unbalance, and leave in place until removal is approved by Engineer.
- .7 Install drainage system in backfill as indicated or as directed by Consultant.

3.9 Restoration

- .1 Upon completion of work, remove surplus materials and debris, trim slopes, and correct defects as directed by Consultant.
- .2 Replace topsoil as indicated.
- .3 Reinstate pavement and sidewalks lawns to elevation which existed before excavation.
- .4 Clean and reinstate areas affected by work as directed by Consultant.

END OF SECTION