SPECIFICATIONS

ADAMSON ESTATE | MULTIPLE PROJECTS RENOVATION AND RESTORATION

ISSUED FOR HERITAGE AND CLIENT REVIEW
DECEMBER 2023

CITY PROJECT No.: 23727
PROJECT No. 202311

Prepared for:
City of Mississauga

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ARCHITECT INC.

DIVISION 01 – GENERAL REQUIREMENTS

DIVISION 02 – EXISTING CONDITIONS

DIVISION 04 – MASONRY

DIVISION 06 – WOOD, PLASTICS AND COMPOSITES

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

DIVISION 08 – OPENINGS

DIVISION 09 – FINISHES

END OF SECTION

1 General

1.1 **WORK TO A HISTORIC PROPERTY**

.1 The buildings to be worked on are historic property and Work should be undertaken with care. The property are designated under Part IV of the Ontario Heritage Act and recognized as a National Historic Place. All work is to be completed with the appropriate methods and standards applied to heritage properties, in particular the Standards and Guidelines for Conservation of Historic Places in Canada.

.2 As specified in individual specification sections, trades are to have heritage project experience.

.3 Where replacement is specified to match original elements, the elements are to be fabricated as close as possible to the original in all respects.

1.2 **GENERAL REQUIREMENTS**

.1 Commence work as specified in the Contract documents after written authorization is issued by the Owner and proceed to ensure Work is completed fully in the specified time according to the Contract.

.2 Perform all work in accordance with the provisions of all applicable by-laws, ordinances, codes regulations, authorities, and standards.

.3 Limit access by work people to those areas of the site required for work of the Contract. Agree means of access to areas of work with Owner before starting work.

.4 Notify Owner and Consultant if any work is proposed to be carried out outside normal working hours, Monday to Friday, 7am-5pm. Unless otherwise agreed, all work is to be performed within the noise By-laws of the region work is being conducted.

.5 Request instructions, clarification, or explanation from the Consultant of any discrepancies, errors or omissions in the Contract Documents, or any doubts as to the meaning or intent of any part.

1.3 **INSURANCES**

.1 Refer to City of Mississauga requirements for insurance.

.2 Provide evidence of insurance and a current certificate of clearance from the Workers' Compensation Board, at the start of work.

.3 Submit copies of insurance policies for Owner's review before contract is signed.

.4 With all applications for payment provide statutory declaration and current certificate of clearance from the Workers' Compensation Board.

1.4 **LIAIBILITY INSURANCE**

.1 Refer to City of Mississauga requirements for insurance.

END OF SECTION

1 General

1.1 **SUMMARY OF WORK**

.1 Work of this Contract comprises of the following scope of work. Work summary to be read in conjunction with the Contract Documents.

i. Restoration of the windows and doors at the Adamson Estate Main House.

ii. Full replacement of the clay roof tile roof including flashings and roofing membrane.

iii. Masonry repointing at back of parapets.

iv. Painting of woodwork on the eyebrow windows and roof related woodwork, ie fascia and soffits.

v. Remove and replace all asphalt on driveway, and parking lots.

vi. Install new traffic calming as indicated on drawings.

vii. Remove and replace existing concrete curb, where indicated on drawings.

viii. Tree protection for trees along roadway and at parking lot.

ix. Repair light standard poles.

x. Replace fixture on top of poles with new.

1.2 **CONTRACT METHOD**

.1 Construct Work under single stipulated price contract. CCDC-2 2008 “Stipulated Price Contract” and all amendments. Bidders are required to familiarize themselves with the form of Contract. All General Conditions and Article of the CCDC Contract Form are included and form part of the Bid Documents.

1.3 **SUBMITTALS**

.1 Submit in accordance with Section 01 33 00 - Submittals.

.2 Submit Project construction progress schedule in accordance with Section 01 30 00 – Project Requirements.

.3 Submit site-specific and Work Plan Health and Safety Planning accordance with Section 01 35 29 - Health and Safety Requirements.

1.4 **WORK SEQUENCE**

.1 Construct Work in stages, if required to provide for continuous usage. If main access is required to be cut off, prior to completing the work coordinate with the Consultant and Owner for alternative access.

.2 Maintain fire access/control.

.3 Protect workers and public safety.

1.5 **DOCUMENTS REQUIRED**

.1 Refer to Specification section Project Requirements 01 30 00.

END OF SECTION

1 General

1.1 **ACCESS AND EGRESS**

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

1.2 **USE OF SITE AND FACILITIES**

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with Owner and Consultant to facilitate work as stated.

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

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

.4 Where using interior spaces protection is required and approval of Owner and Consultant is required prior to use.

.5 Accept liability for damage, safety of equipment and overloading of existing equipment.

1.3 **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 Owner and Consultant to facilitate execution of work.

1.4 **EXISTING SERVICES**

.1 Notify Owner, Consultant, and utility companies of intended interruption of services and obtain required permission.

.2 Where Work involves breaking into or connecting to existing services, give Owner and Consultant minimum of 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 pedestrian and vehicular traffic.

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

1.5 **SPECIAL REQUIREMENTS**

.1 Carry out noise generating Work according to local By-law regulations.

.2 Submit schedule in accordance with Section 01 30 00 – Project Requirements.

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

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

1.6 **SECURITY**

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

1.7 **BUILDING SMOKING AND VAPING ENVIRONMENT**

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

END OF SECTION

1. General

1.1 **CASH ALLOWANCE**

.1 Refer to CCDC 2 – 2008, GC 4.1 and all amendments.

.2 Cash allowances is available for hazardous material removal.

.3 Material and installation contingency allowance shall include and provide payment for:

i. Net cost of material

ii. Applicable duties and taxes

iii. Delivery to site

iv. Handling site, including unloading, uncarting, storage and hoisting.

v. Protection from damage by elements or otherwise.

vi. Labour installation and finishing.

vii. Other expenses required to complete installation.

.3 Expend each allowance as directed by the Consultant.

.4 Cash allowance to be included in base Bid Price.

.5 Each cash allowance will be adjusted to actual cost as defined hereunder and contract price will be amended accordingly by written order.

.6 Progress payments for work and material authorized under cash allowances will be made in accordance with contract terms of payment.

.7 The Contractor Price, and not the cash allowances, includes contractor's overhead and profit in connection with such cash allowance.

.8 Where costs under a cash allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents. Where the actual cost of the Work under the cash allowance is less than the amount of the allowance, the Owner shall be credited for the unexpected portion of the cash allowance, but not for the Contractor's overhead and profit on such amount. Multiple cash allowances shall be combined for the purpose of the calculating the foregoing.

.9 Prepare schedule jointly with Consultant and Contractor to show when items called for under cash allowances must be authorized by Consultant for ordering purposes so that progress of Work to avoid delaying the progress of Work.

1.2 **CONTINGENCY ALLOWANCE**

.1 Refer to CCDC 2 – 2008, GC 4.2 and all amendments.

.2 The Contract Price includes the contingency allowance, if any, stated in the Contract Documents.

.3 The contingency allowance includes the Contractor's overhead and profit in connection with such contingency allowance.

.4 Expenditures under the contingency allowance authorized by the Owner. (GC 6.1, GC 6.2, GC 6.3 – CCDC 2008)

.5 Where costs under a contingency allowance exceed amount of allowance, Contractor will be compensated for excess incurred and substantiated plus allowance for overhead and profit as set out in Contract Documents.

.6 Each contingency allowance will be adjusted to actual cost as defined hereunder and contract price will be amended accordingly by written order.

.7 There will not be extension in time for work under Construction Contingency.

END OF SECTION

1 General

1.1 **REFERENCE STANDARDS**

.1 Owner Agreement

.2 Read all of CCDC 2 2008 Contract forms and all amendments.

1.2 **PAYMENT**

.1 Pay and include in the cost of Work all government sales taxes, custom duties, and excise taxes payable on materials required for Work.

.2 Pay and include in the cost of Work all HST payable on materials and services required for execution of Work.

.3 Prices included in the Contract shall be complete for the applicable Work, and shall include the following costs for each price:

.1 Expenditures for wages and for salaries of workers, engineers, superintendents, draftspersons, superintendents, time-keepers, accountants, expediters, clerks, guards and such other personnel as may be approved, employed directly under the Contractor and while engaged on the applicable Work at the site and expenditures for traveling and board allowances of such employees when required by location of the applicable Work or when covered by trade agreements and when approved; provided however, that nothing shall be included for wages or salary of the Contractor if an individual, or of any member of the Contractor's firm if the Contractor is a corporation, unless otherwise agreed to in writing.

.2 Expenditures for material used in or required in connection with the construction of the applicable work, including material tests and mix designs required by the laws or ordinances of any authority having jurisdiction.

.3 Expenditures for preparation, inspection, delivery, installation and removal of materials plant, tools and supplies.

.4 Temporary facilities as required for the applicable work.

.5 Traveling expenses properly incurred by the Contractor in connection with the inspection and supervision of the applicable work or in connection with the inspection of materials prepared or in course of preparation for the applicable work and in expediting their delivery.

.6 Rentals of all equipment, whether rented from the Contractor or others, in accordance with approved applicable insurance premiums thereon and expenditures for transportation to and from the site of such equipment, costs of loading and unloading, cost of installation, dismantling and removal thereof and repairs or replacements during its use on the applicable Work, exclusive of any repairs which may be necessary because of defects in the equipment when brought to the Work or appearing within Thirty (30) days thereafter.

.7 The cost of all expendable materials, supplies, light, power, heat, water, and tools (other than tools customarily provided by workers) less the salvage value at the completion of the applicable Work.

.8 Assessments under the Worker's Compensation Act, the Unemployment Insurance Act, Canada Pension Act, statutes providing for government hospitalization, vacations with pay or any similar statutes; or payments on account of usual vacations made by the Contractor to his employees engaged on the applicable Work at the site, to the extent to which such assessments or payments for vacations with pay relate to the Work covered by the specified price; and all sales taxes or other taxes where applicable.

.9 The amounts of all subcontracts related to the specified price.

.10 Premiums on all insurance policies and bonds called for under this Contract as related to the specified price.

.11 Royalties for the use of any patented invention on the applicable work.

.12 Fees for licenses and permits in connection with the applicable work.

.13 Duties and taxes imposed on the applicable work.

.14 Duties and taxes imposed on such other expenditures in connection with the applicable work as may be approved.

.15 Provided always that except with the consent of the Owner, the above items of cost shall be at rates comparable with those prevailing in the locality of the work.

.16 The Contractor and all subcontractors shall include any and all overtime costs that may be incurred in the execution of the Work. The Owner will not be responsible for any costs due to overtime work initiated by the Contractor and his sub-trades.

.17 Should it be necessary, due to special work conditions including requirements of the Owner, or in order to complete the contract within the time specified, to carry on overtime work, the Contractor shall furnish and pay for all necessary overtime and other requirements for same at no additional cost to the Owner. Such work shall be carried out in strict conformity with all applicable municipal regulations and the requirements of all authorities having jurisdiction.

1.3 **PRICING OF CHANGES TO WORK**

.1 Submit, with quotations for changes to work, detailed estimate sheets showing labour, materials, and equipment separately.

.2 Payment for use of small tools, travelling, preparations of price change submittals will be considered a part of overhead.

1.4 **APPLICATIONS FOR PROGRESS PAYMENT**

.1 Refer to CCDC 2 2008 GC5.2 and all amendments to CCDC 2 2008.

.2 Applications for Payment to the Consultant must be accompanied by:

.1 The Contractor's Statement of Payment Progress Draw showing a schedule of values of various trades and for various parts of the work in a format acceptable to the Consultant.

.2 At the start of the project a draft Progress Draw to be submitted for review and approval by the Client and Consultant.

.3 From the second application onwards, a Statutory Declaration stating that all subcontractors and their sub-contractors and suppliers have been paid to date and that there are no construction liens outstanding or filed.

.4 A certificate of good standing from the Worker's Compensation Board.

.5 Progress photographs of work for that billing period in digital format.

.6 Certificate of Insurance to be provided on City of Mississauga's prescribed form.

.7 Provide back-up information for sub-contractor claims.

.3 Co-ordinate progress billing with cost breakdown.

.4 Include gross and net value of work completed during billing period.

.5 Include running total of gross and net value of work completed by the end of the billing period.

1.5 **PREPARING SCHEDULE OF UNIT PRICE TABLE ITEMS**

.1 Submit separate schedule of unit price items of Work requested in Bid form.

.2 Make form of submittal parallel to Schedule of Values, with each line item identified same as line item in Schedule of Values. Include in unit prices only:
- .1 Cost of material.
- .2 Delivery and unloading at site.
- .3 Sales taxes.
- .4 Installation, overhead and profit.
- .5 Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.6 **PROGRESS PAYMENT**

.1 In accordance with the requirements of The Construction Act updated 2019 and amendments.

1.7 **PUBLICATION OF NOTICE OF SUBSTANTIAL PERFORMANCE**

.1 Refer to CCDC 2 2008 GC5.4 and all amendments to CCDC 2 2008.

.2 In accordance with the requirements of The Construction Act updated 2021, and amendments, the Contractor shall be responsible for publication of a Notice of Substantial Performance in the Daily Commercial News and/or other periodicals deemed to meet the requirements of the Act.

.3 The Contractor shall be responsible for paying the cost of publishing the notice and shall provide to the Consultant a copy of the issue of the publication in which the notice appeared as soon as it is available.

1.8 **HOLDBACK**

.1 Invoices paid under the contract will be subject to a 10% holdback accordance with The Construction Act updated 2021. Plus an additional 2% warranty holdback per City of Mississauga terms.

.2 Provide the Consultant with letters from all subcontractors/suppliers stating that they have paid in full and have no further claims against the Owner under the Contract.

.3 Holdback will be released after required holding period and once the Consultant receives the letters identified in item 1.6.2. Refer to CCDC 2 2008 GC5.5 and 5.6 and all amendments to CCDC 2 2008.

1.9 **FINAL PAYMENT**

.1 Refer to CCDC 2 2008 GC57, all amendments to CCDC 2 2008, and Construction Act.

END OF SECTION

.1 General

1.1 **ADMINISTRATION OF CONTRACT**

.1 Provide administrative requirements for the proper coordination and completion of work, including supervisory personnel, preconstruction conference and project meetings.

1.2 **CO-ORDINATION AND CO-OPERATION**

.1 The Contractor shall be responsible for the proper co-ordination of all subcontractors.

.2 Each subcontractor shall familiarize themselves with work of all other contractors to properly prepare their work and make provisions to facilitate the work of others.

.3 Do not proceed with any work without consulting the drawings and specifications of all trades involved in the work.

1.3 **HEALTH AND SAFETY**

.1 Refer to Specification section Health and Safety Requirements 01 35 29.

.2 Provide Health and Safety plan for the work site, which includes procedures related to COVID-19.

1.4 **PRE-CONSTRUCTION MEETING**

.1 Arrange a preconstruction meeting to discuss and resolve administrative and site management issues within 10 working days after award of Contract.

.2 Attendance to include Owner, Consultant, and subcontractors.

.3 Provide 5 working days' notice before meeting.

.4 Location and time to be coordinated in advance with the Owner and Consultant.

.5 Agenda to include as required:

.i Appointment of official representative of participants in the Work.

.ii Schedule of Work: identifying construction progress. Schedule to be provided in Bar (GANTT) Chart.

.iii Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittals.

.iv Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

.v Monthly progress claims, administrative procedures, photographs, hold backs.

.vi Appointment of inspection and testing agencies or firms.

1.5 **PROGRESS MEETINGS**

.1 Are to be conducted bi-weekly, or on a regular schedule as required. Schedule of meetings will be determined at project construction start.

.2 Contractor responsible for preparing, in consultation with the Consultant, and distributing agenda two working days prior to the scheduled meeting to the Owner, Consultant and subcontractor/suppliers whose work is covered by agenda items.

.3 Contractor responsible for preparing and distributing minutes to all meeting participants and affected parties. Minutes to be distributed within three working days following the site meeting. Attendance and action items are to be clearly identified in minutes.

.4 Once a month an updated work schedule is to be included with minutes.

.5 Agenda to include as required:

.vii Review, approval of minutes of previous meeting.

.viii Review of Work progress since previous meeting.

.ix Field observations, problems, conflicts.

.x Problems which impede construction schedule.

.xi Review of off-site fabrication delivery schedules.

.xii Corrective measures and procedures to regain projected schedule.

.xiii Revision to construction schedule.

.xiv Progress schedule, during succeeding work period.

.xv Review submittal schedules: expedite as required.

.xvi Maintenance of quality standards.

.xvii Review proposed changes for effect on construction schedule and on completion date.

.xviii Other business.

1.6 **SCHEDULES**

.1 As required following schedules are to be prepared and distributed at the start-up of the project and updated on a monthly basis, unless otherwise noted or requested.

.i Project Schedule

.ii Submittal Schedule

.iii Schedule of Values

.2 Update Project Schedule on bi-weekly basis reflecting activity changes and completion, as well as activities progress.

1.7 **PROJECT RECORD DOCUMENTS**

.1 Maintain on site, one copy of the following record documents; record actual revisions to the Work:

.i Contract Drawings.

.ii Specifications

.iii Project Manual.

.iv Addenda.

.v Change Orders and other modifications to the Contract.

.vi Reviewed shop drawings, product data, and samples.

.vii List of Outstanding Shop Drawings.

.viii Field Test Reports.

.ix Copy of Approved Work Schedule.

.x Health and Safety Plan and Other Safety Related Documents.

.xi Photo documentation.

.xii Other documents as specified.

.2 Record information concurrent with construction progress

.3 Record Documents and Shop Drawings: Legibly mark each item to record actual construction including, but not limited to:

.i Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.

.ii Field changes of dimension and detail.

.iii Details not on original Contract Drawings

1.8 **CONTACTS**

.1 Submit and post list of project contacts.

.2 Submit and post list of emergency telephone numbers and emails for individuals to be contacted in case of emergency.

END OF SECTION

.1 GENERAL

1.1 **ADMINISTRATIVE**

.1 This section specifies general requirements and procedures for contractor's submissions of shop drawings, product data, samples and mock-ups to Owner's Representative 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 an extension of Contract Time and no claim for extension by reason of such default will be allowed.

.2 Do not proceed with work until relevant submissions are reviewed by Owner's Representative.

.3 Notify Owner's Representative, in writing of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations,

.4 Verify field measurements and affected adjacent Work are coordinated.

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

.6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Owner's Representative review of submission unless Owner's Representative gives written acceptance of specific deviations.

.7 Make any changes in submissions which Owner's Representative may require consistent with Contract Documents and resubmit as directed by Owner's Representative. When resubmitting, notify Owner's Representative in writing of revisions other than those requested.

.8 Notify Owner's Representative, in writing, when resubmitting, of any revisions other than those requested by Owner's Representative.

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

1.2 **SUBMITTALS**

.1 Submit all shop drawings, samples and other items in accordance to this Section to the Consultant for distribution.

.2 Submit to the Consultant shop drawings, samples and other items in accordance to this Section.

.3 All submittals to the Consultant's office to include prepaid carrying and all other charges.

.4 Submittals are to be clearly labelled with the Project Name, Date, and Identification of submittal (material, supplier, etc.), Name of Contractor and whether it is first submittal or resubmittal.

.5 Allow five (5) working days for Consultant review of each submission.

.6 Submit electronic copy in PDF format of product data sheets or brochures for requirements requested in Specification Sections and as requested by Owner's Representative where shop drawings will not be prepared due to standardized manufacture of product.

.7 Submit in good time to avoid delay. Allow for multiple Consultant reviews. And factor timing for resubmittals.

1.3 **SHOP DRAWINGS AND PRODUCT DATA**

.1 Refer to CCDC 2020 GC 3.11 and all amendments of CCDC 2020.

.2 The term shop drawing includes drawings, diagrams, illustrations, schedules, performance charts, product data, brochures and other data to be provided to illustrate portions of the Work.

.3 Shop drawings are to be submitted for Consultant review with reasonable promptness and in a sequence not to cause delay in the Work.

.4 Allow enough time for submittal review and factor timing for resubmittals.

.5 Shop drawings shall be submitted legible. If drawings are deemed illegible they will be rejected.

.6 Submit one (1) electronic copy in PDF format of shop drawings for each requirement requested in specification Sections and as Owner's Representative may reasonably request.

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

.8 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 coordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications

.9 Shop drawings shall show materials, methods of construction and attachment or anchorage, erection diagrams, connections and other details necessary to complete the work.

.10 The Consultant review is for the sole purpose of determining conformance with general design concept. The review shall not mean that the Consultant approves the detail design inherent in the shop drawings; responsibility shall remain with the Contractor. Review will not relieve the Contractor of their responsibility for errors or omissions in the shop drawings or responsibility for meeting all requirements of contract documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for coordination of Work.

.11 Changes to the shop drawings made by the Consultant are not intended to change the Contract Price. If Contractor deems the change impacts the value of work, it is to be stated in writing prior to fabrication and installation of work.

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

.13 Accompany submissions with transmittal letter containing:

- .i Date.
- .ii Project title and number.
- .iii Contractor's name and address.
- .iv Identification and quantity of each shop drawing, product data and sample.
- .v Other pertinent data.

.12 Submissions include:

- .i Date and revision dates.
- .ii Project title and number.
- .iii Name and address of: Subcontractor, Supplier, Manufacturer.

.13 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.

.i Details of appropriate portions of Work as applicable:

a. Fabrication.
b. Layout, showing dimensions, including identified field dimensions, and clearances.
c. Setting or erection details.
d. Capacities.
e. Performance characteristics.
f. Standards.
g. Operating weight.
h. Wiring diagrams.
i. Single line and schematic diagrams.
j. Relationship to adjacent work.

.14 After Consultant's review, distribute copies.

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

.16 Submit electronic copies of manufacturer's instructions for requirements requested in specification Sections and as requested by Consultant.

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

1.4 **SAMPLES**

.1 Provide material samples specified in trade sections on site for Consultant review.

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

.3 Deliver samples prepaid to Consultant's business address.

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

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

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

.7 Make changes in samples which Consultant may require, consistent with Contract Documents.

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

1.5 **PHOTOGRAPH DOCUMENTATION**

.1 Contractor is responsible for taking photographs of the existing condition, during work and completion of work.

.2 All photographs are to be supplied to the Owner and Consultant at the end of the project in digital format. Photographs during the project are to be available for review by the Owner at any time upon request. Progress photographs are to be included with the monthly invoice submissions

.3 Photographs to be dated and location noted on the electronic file or back of printed copy. Final submission is to be provided on a thumb drive or DVD. The submission is to be clearly labelled with the Project Name and date.

1.6 **MOCK-UPS**

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

.2 The following is a list of mock-ups required prior to work commencing for each item. This is not an exhaustive list, refer to specific sections. Mock-ups may be requested by the Consultant on site during construction that is not listed here.

.3 Mock-Ups list, includes but not limited to;

- .i Sash removal for restoration off-site
- .ii Paint removal
- .iii Putty removal
- .iv Putty installation
- .v Painting application including prep, (both primer and top coat)
- .vi Sash re-installation
- .vii All roof flashings
- .viii Installation of roof tiles

END OF SECTION

1 General

1.1 **REFERENCE STANDARDS**

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

.2 Province of Ontario

i. Occupational Health and Safety Act and Regulations for Construction Projects, R.S.O. [1990, c.0.1, as amended and O. Reg. 213/91 as amended] - Updated [2005].

1.2 **ACTION AND INFORMATIONAL SUBMITTALS**

.1 Submit in accordance with Section 01 33 00 - Submittals.

.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:

ii. Results of site-specific safety hazard assessment.

iii. Results of safety and health risk or hazard analysis for site tasks and operation.

iv. COVID-19 Health and Safety Plan.

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

.4 Submit copies of incident and accident reports.

.5 Submit WHMIS Safety Data Sheets (SDS).

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

.7 Consultant'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.

1.3 **FILING OF NOTICE**

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

.2 Contractor shall agree to install proper site separation and identification in order to maintain time and space at all times throughout life of project. Refer to Specification section Temporary Barriers and Enclosures 01 56 00.

1.4 **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 Consultant may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.

1.5 **RESPONSIBILITY**

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

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

1.6 **COMPLIANCE REQUIREMENTS**

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

1.7 **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 Owner and Consultant verbally and in writing.

1.8 **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 Consultant.

1.9 **CORRECTION OF NON-COMPLIANCE**

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

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

.3 Owner or Consultant may stop Work if non-compliance of health and safety regulations is not corrected.

1.10 **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.

END OF SECTION

.1 General

1.1 **SUMMARY**

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

1.2 **GENERAL**

.1 Read all of CCDC 2 – 2008 and all amendments.

.2 Perform Work in accordance with the provisions of all applicable by-laws, ordinances, codes, regulations, authorities and standards, including, but not limited to, the following:

i. Ontario Ministry of the Environment, Hazardous Contaminants Branch;

ii. Construction Safety Act;

iii. Occupational Health and Safety Act;

iv. Workman's Safety Insurance Act;

v. Ontario Building Code;

vi. Other applicable codes and regulations.

.3 Reference to by-laws, ordinances, codes, regulations, authorities and standards, as well as contract forms, manuals and instructions, shall be to the latest published editions at date of submission of Bid.

.4 Abide by the regulations of all authorities having jurisdiction.

.5 The "Contractor" referred to in the Contract Documents shall be considered as the "Constructor" named in the Occupational Health and Safety Act.

.6 Meet or exceed requirements of specified standards, codes and referenced documents.

.7 Do not undertake Work, which is conditional on permits or approvals until certain that all conditions necessary to obtain these are met. No time extension will be allowed for delay in obtaining necessary permits.

END OF SECTION

.1 General

1.1 **GENERAL**

.1 Read all of CCDC 2 2008 and all amendments. For this section refer specifically to the following:

.2 GC 2.3 Review and Inspection of Work

.3 GC 2.4 Defective Work.

1.2 **INSPECTION AND TESTING (3RD PARTY)**

.1 Allow Owner's Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.

.2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Owner's Representative instructions.

.3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.

.4 Provide samples for testing as and when requested by the Consultant.

.5 Employment of testing agencies does not relax the Contractor's responsibility to perform work in accordance with the Contract Documents.

.6 If defects are revealed by testing, the laboratory may request additional testing to ascertain full extent of defect. Correct defects as advised by the Consultant at no cost to the Owner. Pay costs for re-inspection and re-testing.

1.3 **FIELD SAMPLES AND MOCK-UPS**

.1 As required by other Sections or as requested, mock-ups of the work showing all materials, finishes as a completed assembly.

.2 Locations, area and size to be reviewed prior to commencing mock-ups with the Consultant.

.3 Prepare mock-ups in a timely manner for Consultant review to not delay Work. Provide 48 hours notice to Consultant for review of finished mock-ups.

.4 Approved mock-up to be used as the minimum standard for quality of work for similar work. Approved mock-up may be used as part of the completed Work.

.5 Failure to prepare mock-ups in ample time is not considered sufficient reason for Contract time extension. No claim for time extension with such reason will be allowed.

1.4 **TOLERANCES**

.1 Unless tolerances are otherwise specified in the Contract documents, they are considered to be the following:

.1 "Plumb and level" means plumb and level within 1/8" in 10'-0".

.2 "Square" means not in excess of 10 seconds lesser or greater than 90 degrees.

.3 "Straight" means within 1/8" under a 10'-0" long straight edge.

.4 Existing historic building fabric may not meet these tolerances. Do not attempt to make plumb and level, square or straight any original heritage building fabric without approval by the Consultant.

1.5 **REJECTED/DEFECTIVE WORK**

.1 Refer to CCDC 2008, GC 2.4 and all amendments.

.2 Defective work discovered before expiration of the warranty period specified in the Contract or if extended by this Specification, will be made good by the Contractor, whether or not it has been previously noted or scheduled during the Consultant's inspection, at no cost to the Owner.

.3 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 Consultant as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.

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

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

1.6 **REPORTS**

.1 Submit 1 digital copy of inspection and test reports to Consultants.

.2 Provide copies to all relevant parties.

END OF SECTION

1 GENERAL

1.0 **PRODUCT HANDLING**

.1 Protection: maintain temporary facilities in proper and safe condition throughout work progress.

.2 Replacements: in the event of loss or damage, make all repairs and replacements necessary to the approval of the Consultant and Owner at no additional cost to the Owner.

1.1 **WATER SUPPLY**

.1 Owner will provide an adequate pure water supply for scope of restoration work to be carried out.

.2 If large quantities or a water truck is required for the site scope of work it is the responsibility of the Contractor.

.2 Water supply will be coordinated upon award of the Contract.

1.2 **ELECTRICAL SUPPLY**

.1 Owner will provide an adequate electrical supply for scope of work to be carried out.

.2 Further coordination upon award of the Contract.

.3 Provide temporary lighting required to carry out the work.

1.3 **TEMPORARY HEATING AND VENTILATION**

.1 Provide temporary heating as required during construction period, including attendance, maintenance and fuel.

.2 Provide temporary heat and ventilation in enclosed areas as required to:

i. Facilitate progress of Work.

ii. Protect Work and products against dampness and cold.

iii. Prevent moisture condensation on surfaces.

iv. Provide ambient temperatures and humidity levels for storage, installation and curing of materials.

v. Provide adequate ventilation to meet health regulations for safe working environment.

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

.5 Ventilating:

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

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

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

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

1.4 **SANITARY FACILITIES**

.1 The Contractor is permitted to use the sanitary facilities located in the building of Work.

.2 The Contractor is responsible for keeping the facilities clean, and in good working order.

1.5 **PROTECTION DEVICES**

.1 Erect fencing, barricades, covered ways, tarpaulins, steps, and protection of all kinds for the protection of the workmen working on the project, for protection of the surrounding property and the public in accordance with local regulations.

1.6 **PORTABLE FIRE EXTINGUISHERS**

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

.2 Provide portable fire extinguishers throughout the work areas; conform with fire authority for locations.

.3 Maintain extinguishers to requirements of Canadian Fire Underwriters' Association.

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

1.7 **FIRST-AID FACILITIES**

.1 Contractor to provide first aid facilities in accordance with Workmen's Compensation Act.

1.8 **STORAGE AREA**

.1 Refer to CCDC 2 2008, GC 3.12

.2 Location for storage will be determined upon site review with the Owner, Consultant and Contractor for best location for properly completing the Work.

1.9 **SITE OFFICE**

.1 To be coordinated with the Owner at award of Contract.

1.10 **PARKING**

.1 Parking permits will be coordinated and provided by the Owner for a parking lot near the work site. Number of permits will be confirmed upon award of the Contract.

1.11 **CLEANING**

.1 Keep the work area broom and debris clear at all times and remove debris on a daily basis.

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

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

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

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

END OF SECTION

.1 General

1.1 **RELATED REQUIREMENTS**

.1 Section 01 52 00 Construction Facilities.

1.2 **INSTALLATION AND REMOVAL**

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

.2 Remove from site all such work after use.

1.3 **WEATHER ENCLOSURES**

.1 Provide weather tight closures to unfinished door and window openings.

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

1.4 **DUST TIGHT SCREENS**

.1 Provide dust tight screens 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.

1.5 **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.

1.6 **FIRE ROUTES**

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

1.7 **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.

1.8 **PROTECTION OF BUILDING**

.1 Provide the required protection and closure of the building where windows and/or doors have been removed to complete the scope of work.

.2 It is the Contractors responsibility during the work to ensure the building is secure and protected preventing unauthorized entry.

1.9 **PROTECTION OF BUILDING FINISHES**

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

.2 Provide necessary screens, covers, and hoardings.

.3 Confirm with Consultant locations and installation schedule 3 days prior to installation.

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

1.10 **PROTECTION OF TREES**

.1 Tree protection is the responsibility of the Contractor.

.2 Refer to the arborist report and drawings within the Contract Documents for requirements for tree protection.

1.11 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate waste materials for reuse and recycling and dispose of materials appropriately and according to Authorities having Jurisdiction regulations.

END OF SECTION

1 General

1.1 **ADMINISTRATIVE REQUIREMENTS**

.1 Pre-warranty Meeting:

i. Convene meeting one week prior to contract completion with contractor's representative, Owner and Consultant, in accordance with Section Project Requirements 01 30 00 to:

a) Verify Project requirements.

b) Review manufacturer’s installation instructions and warranty requirements.

.2 Consultant to establish communication procedures for:

i. Notifying construction warranty defects.

ii. Determine priorities for type of defects.

iii. 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.

1.2 **ACTION AND INFORMATIONAL SUBMITTALS**

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

.2 Two weeks prior to Substantial Performance of the Work, submit to the Consultant, electronic final copies of maintenance manuals in English.

.3 Provide maintenance materials of same quality and manufacture as products provided in Work.

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

.5 The Contractor shall be responsible for entering into the Owner’s prescribed form, a complete list of all capital assets he is installing. The prescribed form is described in the Owner's Bid Documents.

1.3 **FORMAT**

.1 Organize data as instructional manual.

.2 Documents can be provided in digital format, 1 USB for Owner, digital transfer for Consultant.

.3 Main folder to be titled with project name and year.

.4 Organize each item within appropriate folders, example – Warranty.

.5 Identify each file with title, example 099100_PaintingWarranty.

.6 Arrange content by process flow, under Section numbers and sequence of Table of Contents.

.7 As-built drawings to be properly labelled for ease of future finding, example A100_GroundFloorPlan_YRMONDAY

1.4 **CONTENTS - PROJECT RECORD DOCUMENTS**

.1 Table of Contents for Each Volume: provide title of project;

i. Date of submission; names.

ii. Addresses, and telephone numbers of Consultant and Contractor with name of responsible parties.

iii. Schedule of products and systems, indexed to content of volume.

.2 For each product:

i. List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies.

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

.4 Typewritten Text: as required to supplement product data.

i. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions specified in Section 01 45 00 - Quality Control.

1.5 **AS -BUILT DOCUMENTS AND SAMPLES**

.1 Maintain, in addition to requirements in General Conditions, at site for Consultant and Owner one record copy of:

i. Contract Drawings.

ii. Specifications.

iii. Addenda.

iv. Change Orders and other modifications to Contract.

v. Reviewed shop drawings, product data, and samples.

vi. Field test records.

vii. Inspection certificates.

viii. Manufacturer's certificates.

.2 Store record documents and samples in field office apart from documents used for construction.

.3 Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual.

i. Label each document "PROJECT RECORD" in neat, large, printed letters.

.4 Maintain record documents in clean, dry and legible condition.

i. Do not use record documents for construction purposes.

.5 Keep record documents and samples available for inspection by Consultant.

1.6 **RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS**

.1 Record information concurrently with construction progress.

i. Do not conceal Work until required information is recorded.

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

i. Field changes of dimension and detail.

ii. Changes made by change orders.

iii. Details not on original Contract Drawings.

iv. Referenced Standards to related shop drawings and modifications.

.3 Specifications: mark each item to record actual construction, including:

i. Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.

ii. Changes made by Addenda and change orders.

.4 Other Documents: maintain certifications, field test records, as required by individual specifications sections.

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

1.7 **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.

1.8 **MAINTENANCE MATERIALS**

.1 Extra Stock Materials:

i. Provide maintenance and extra materials, in quantities specified in individual specification sections.

ii. Provide items of same manufacture and quality as items in Work.

iii. Deliver to site, place and store.

.2 Receive and catalogue items.

i. Submit inventory listing to consultant.

ii. Include approved listings in Maintenance Manual.

.3 Obtain receipt for delivered products and submit prior to final payment.

1.9 **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.

1.10 **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:

i. Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.

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

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

iv. Verify that documents are in proper form, contain full information, and are notarized.

v. Co-execute submittals when required.

Retain warranties and bonds until time specified for submittal.

.7 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.

.8 Conduct joint 12 month warranty inspection, measured from time of acceptance, by Consultant.

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

.10 Written verification to follow oral instructions.

i. Failure to respond will be cause for the Consultant to proceed with action against Contractor.

.11 The Contractor shall be responsible for entering into the Owner’s prescribed form, a complete list of all capital assets he is installing. The prescribed form is described in the Owner's Bid Documents.

.12 Refer to City of Mississauga Warranty sheet in bid documents for full extent of warranty requirements.

END OF SECTION

1 General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 01.

1.2 **PRE-START HEALTH AND SAFETY REVIEW**

.1 Provide a Pre-Start Health and Safety Review in accordance with the Occupational Health and Safety Act (Ontario), Regulation 851, as amended.

1.3 **SCOPE OF WORK**

.1 Work under this section covers the requirements for demolition and preparatory Work including dismantling, salvaging, relocating, and removing wholly or in part various items designated on drawings or required to be removed or partially removed for the Work of this Contract; demolition and preparatory Work include but not limited to:

.1 Removal of rubbish, debris, and items resulting from Work of this Section,

.2 Dust control during the operations of the Work of this Section.

1.4 **EXISTING CONDITIONS**

.1 Visit and examine Site, review Site conditions, drawings, and specification to ascertain the extent and nature of Work of this Section. Note all characteristics and irregularities affecting the Work of this Section.

.2 Arrange examination of existing building and property with the Owner and Consultant.

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

1.5 **QUALITY ASSURANCE**

.1 Comply with pertinent codes, regulations and insurance carriers providing coverage for the Work of this Section.

.2 Execute Work of this Section in accordance with Occupational Health and Safety Act, Ontario Regulation 213/91, Construction Projects. Keep copy of Act at the Place of the Work at all times.

.3 Execute demolition Work in accordance with CAN/CSA S350.

.4 A review will be made after completion of Work of this section by Owner and Consultant to assess any outstanding or remaining Work of this Section.

1.6 **PROTECTION**

.1 Use all means necessary to protect existing building and finish, and in the event of damage, immediately make all repairs and replacements necessary to the acceptance of the Owner and Consultant, and at no additional cost to the Owner.

.2 Provide protection required to enable existing building and equipment to remain in continuous and normal operations and maintain construction schedule.

.3 Erect barricades, covered ways, barriers, scaffolding, screens, notices, and warning boards and maintain all lights, signals, and protection of all kinds for the protection of workers performing the Work, for the protection of existing building, adjacent and adjoining properties, and for the protection of public and building occupants.

.4 Prevent movement or settlement of adjacent Work. Provide and place bracing or shoring and be responsible for safety and support of such Work. Be liable for any such

movement or settlement, and any damage or injury caused, and at no additional cost to the Owner.

.5 Cease operations and notify Owner and Consultant if safety of any adjacent buildings or structure appears to be endangered. Take all precautions to support the structure. Do not resume operations until the Work is reviewed by the Owner.

2 Products

2.1 **MATERIALS**

.1 General: Dismantled materials become Contractor's property. Remove materials from Site daily.

3 Execution

3.1 **PREPARATION**

.1 Notify the Owner and Consultant at least two full working days prior to commencing of the Work of this Section.

.2 The drawings do not purport to show all objects existing on the Site.

.3 Schedule all Work in a careful manner with all necessary consideration for the requirements of the Owner, their employees, and the public.

.4 Avoid interference with the use of, and passage to and from, adjacent buildings and facilities.

.5 Before starting the operations, arrange with the appropriate trade concerned for the disconnection of all utility services, affecting the Work.

.6 Preserve in operating condition all active utilities to remain.

3.2 **DEMOLITION AND PREPARATORY WORK**

.1 In order to afford the least interference with the operations of the existing building and to keep the risk of fire to a minimum at all times, ensure that dismantled materials are continuously removed from the buildings and grounds as they accumulate, that no hazard condition is left during non-working hours and that full measures are taken to keep dust to a minimum and to confine what dust there is within the working area.

.2 Maintain proper and safe means of fire exit from all zones of the existing building to the approval of the authorities having jurisdiction.

.3 Confine operation to those parts of the buildings, which are to be altered or renovated. Do not damage existing construction beyond that necessary for performance of new Work and repair such damage as required.

.4 Carefully remove materials and equipment to be relocated for reuse in the new Work in re-usable condition, transport and store on the Site where directed by the Owner and protected against damage.

.5 Do not undermine or damage existing structure, mechanical systems, and electrical systems. Undermined, damaged or endangered Work is to be made good at no additional cost to the Owner.

.6 Where cutting openings through existing walls, and roofs establish exact location of steel reinforcing and services before holes are made. Be responsible for damage to existing reinforcement and be liable for structural failure. Make good surfaces disturbed with materials to match existing.

.7 Dismantle Work into sections of practical size for removal without alteration or damage to the existing building remaining in place.

.8 Upon completion of demolition, leave surfaces broom clean.

.9 Join and make good new Work to existing in such a manner that the joint is structurally sound and inconspicuous.

.10 Cuts, breaks and other temporary openings into existing surfaces, which are required for installation or application of new fixtures, fitments, materials, or services shall be, at completion of Work, patched and made good and finished to match surrounding finishes. Openings to allow passage of ducts shall be closed tight to perimeters of duct at all locations where fire dampers are required.

.11 Where fireproofing membranes or coverings to existing structural steel members and open web steel joists are disturbed, restore the fire protection with materials and methods acceptable by the authorities having jurisdiction.

.12 Materials and other equipment not required for re-use shall not be stored or sold from the Site.

.13 Burning of materials on Site is prohibited.

.14 Maintain the existing building in a weather and watertight condition at all times.

END OF SECTION

1. General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.1 **SCOPE OF WORK**

.1 Pointing of deteriorated exterior mortar joints as noted in Contract documents.

.2 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately, but will be considered incidental to work of this section.

.3 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing flashings and finishes to accommodate the masonry repairs.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

.5 All work to be completed in accordance with the Health and Safety Guideline for Silica on Construction Projects by Occupational Health and Safety Branch of the Ministry of Labour.

1.2 **DEFINITIONS**

.1 As defined in CSA A371 “Masonry Construction for Buildings”:

.1 Raking: Removing loose/deteriorated mortar until solid and sound mortar is found to a depth suitable for repointing and/or 4x joint thickness. Including the removal of pointing mortar from the face of the precast stone at the joint edge.

.2 Repointing: filling and finishing of masonry joints from which mortar is missing, has been raked out or has been omitted.

.3 Finish pointing: Removing deteriorated mortar from the joints of masonry wall to depth of 25mm (1”) measured from the face of the masonry unit and beyond the existing depth of repointing. Then filling and finishing with new mortar.

.4 Back pointing: Removing deteriorated mortar joints beyond repointing depth specified to bring mortar face to specified depth for raked joints in preparation of finish pointing.

.5 Tooling: Compressing and shaping the face of masonry joint with a special tool to provide final contour.

1.3 **INTENT OF WORK**

.1 Intent of the work of this section is to replace existing deteriorated, unsound mortar joints with a sound, durable mortar joint.

1.4 **UNIT PRICES**

.1 For additional pointing outside scope identified on Contract documents.

.1 Repointing: price/ foot.

.2 Back-pointing: price/ foot.

1.5 **REFERENCES**

.1 CAN3-S304: Masonry Design for Buildings

.2 CSA A371: Masonry Construction for Buildings

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

.4 CAN/CSA-A179-[04], Mortar and Grout for Unit Masonry.

.5 ASTM C 1713-[15] Standard Specification for Mortars for the Repair of Historic Masonry

.6 Annotated specifications for Restoration of Historic Masonry (Ministry of Citizenship and Culture, Province of Ontario, Toronto, Canada, 1985)

1.6 **SUBMITTALS**

.1 NOT USED.

1.7 **QUALITY ASSURANCE**

.1 Consultant reserves the right to reject Masonry Contractor or proposed Project Supervisor, mason or apprentice if, documentation provided does not demonstrate level of experience or skill required for successful completion of Work of this Contract.

1.8 **QUALIFICATIONS**

.1 The installer shall be a company specializing in heritage masonry work with a minimum of ten (10) years proven experience for projects of similar size and complexity. Experience should include working on heritage buildings, where integrating into existing masonry was required.

.2 All work to be completed by qualified and experienced trades people with minimum of ten (10) years experience in the type of work specified.

.3 All work to be executed under the direction and continuous supervision of qualified mason.

.4 Use single masonry Contractor for all masonry work.

1.9 **MOCK-UP**

.1 All masons to perform cutting out and pointing mock-ups for Consultant review. Only masons whom receive written approval will be permitted to continue with the work.

.2 Mock-up intent is to confirm quality of cutting out, mortar colour, and tooling.

.3 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.4 The Contractor must receive written confirmation of the mock-up acceptance prior to commencing with the work.

.5 Approved mock-ups shall serve as the standard to which all related work will be evaluated.

.6 Rejected mock-ups will be removed and disposed of at the expense of the Contractor.

1.10 **DELIVERY, STORAGE AND PROTECTION**

.1 Materials to be stored in accordance with section 04 90 00 Mortars.

1.11 **WARRANTY**

.1 The Contractor shall submit a warranty of the work of this section covering a period of not less than two (2) years from the date of Substantial Performance of the Contract. Substantial completion shall be determined by the Consultant and the Owner.

.2 Defective work shall include, but is not limited to, cracking, crumbling, loss of adhesion, loss of cohesion, discolouration, premature deterioration and out of plane movement.

1.12 **ENVIRONMENTAL REQUIREMENTS**

.1 Execute the work when the ambient temperature is above four (4) degrees Celsius. When the ambient temperature is below four (4) degrees Celsius, use care and heat as directed by the Consultant. Refer to section 3.4.

.2 When temperature is below zero (0) degrees Celsius or below five (5) degrees Celsius and falling no mortar is to be placed in open air.

.3 Refer to section 3.3 for cold and hot weather protections.

.4 Remove work exposed to temperatures lower than 5 degrees C as directed by Consultant.

.5 When ambient temperature is above 21 degrees C:

.1 Protect repointed areas from direct sunlight and wind.

.2 Use protective methods acceptable to the Consultant.

.4 Provide humid cure for a minimum of 7 days.

1.13 **EXISTING CONDITIONS**

.1 The Contractor shall provide all required support to safely support all the loads.

.2 The decision to repoint the existing masonry is based on cracked, loose and crumbling mortar joints. Should any other masonry deterioration be detected during the execution of the work that is unrelated to the noted visual defects, immediately inform the Consultant.

.3 At the beginning of the work the Consultant and Contractor will review the building for joint deterioration to determine exact areas of work. These areas will be recorded and updates of the quantities will be maintained for costing purposes.

.4 Study pointing styles and methods for reproducing them before starting the work.

.5 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as the other aspects of workmanship, which establish the authenticity of the original work.

1.14 **ALTERNATIVES**

.1 NOT USED.

2. Products

2.1 **MANUFACTURERS**

.1 Refer to section 04 03 08 Mortars.

2.2 **MATERIALS**

.1 Refer to section 04 03 08 Mortars.

2.3 **EQUIPMENT**

.1 Chisels: all cutting out of joints to be done with hammer and chisel, unless otherwise specified.

.2 All masons to use identical jointing tools.

.3 Brushes: fibre-bristle or plastic. No metal bristle brushes to be used.

.4 Power tools: hand held rotary saws and grinding disks to be used only when specified in section 3.0 Execution.

3. Execution

3.1 **EXAMINATION**

.1 In conjunction with the Consultant review identify deteriorated joints for restoration. Review to be performed visually and by testing for voids and weakness using a chisel. Joints will be marked and recorded in cooperation with the Consultant.

.2 Verify that surfaces and conditions are ready to accept the work of this section.

.3 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.4 Examine mortar joints.

.1 Examine horizontal and vertical joints to determine which were struck first and whether they are the same style, as well as aspects of quality of work which establish authenticity of original work.

.2 Replicate the style selected by Consultant.

3.2 **PREPARATION**

.1 Protect adjacent finished materials from marking or damage due to the work.

.2 Seal and protect all openings, doors, windows and adjacent areas to minimize the potential for damage and the spread of dust, water or other materials into the building or adjacent sidewalks and properties.

.3 All projections should be covered with rigid protection, secured into the joints for the duration of the work.

.4 Provide and install the safety devices and signs near the work area.

.5 Install temporary shoring, bracing or other supports as necessary to support loading in the area of work.

.6 The top surface of uncompleted masonry and openings in the building during the work shall be completely covered and protected with non-staining waterproofing covers when the construction is not in process.

.7 Ensure workers have appropriate protection from dust and debris during the cutting out of joints.

3.3 **COLD AND HOT WEATHER PROTECTION**

.1 Refer to section 04 03 08 Mortars for requirements of this section.

3.4 **PROTECTION**

.1 Protect new work from damage by weather. At end of each day or shutdown period, cover exposed areas of new work with canvas or strong waterproof non-staining

membrane to prevent water from entering partially completed work, and secure to prevent lifting during high winds.

.2 Contractor must maintain the exterior walls watertight at all times to prevent moisture penetration into the wall fabric. The Contractor shall be responsible for all costs associated with damage associated with moisture penetration resulting from inadequate protection as determined by the Consultant.

3.5 **MORTAR REMOVAL/RAKING JOINTS**

.1 Mortar is defective when it is cracked, spalled, chalked, void or otherwise crumbling and previously pointed with hard cement and sand mortar.

.2 Consultant Review

.1 The Contractor shall provide access, permit inspection, correct any defects and obtain written approval of all raked joints prior to commencing with the pointing.

.3 Where mortar is found to be defective beyond the specified raking depth, the Contractor shall continue raking until solid mortar is encountered. Remove all loose mortar, dirt and other undesirable material.

.4 Be aware that additional raking beyond specified depths will be necessary and that voiding can be expected. Back pointing will be required at these locations prior to repointing.

.5 If masonry unseats or the bond is broken, remove the unit and reset in accordance with the work outlined in this section.

.6 Do not cut out sound adjacent joints. Leave in their existing condition.

.7 Tools and Techniques

.1 Tools used for cutting out of the mortar joints shall be narrower than the joint.

.2 Cutting out of the joint shall be performed using the following techniques:

.1 Partial cutting out of the horizontal joints - Hand held rotary saws or any type of grinding disk are permitted provided that a robust dust collection system is put in place to collect dust. And a qualified mason oversees work. Start cut in centre of joint max. 13mm width and cut to full depth required.

.2 Cutting out to stop short of end of joint to avoid over cutting. If over cutting is found Consultant will cease approval to use power tools and removals will need to be completed with hand tools only.

.3 Final cutting out of remaining horizontal mortar joints to specified depth and cutting out of vertical joints to be completed using hand tools.

.4 Vertical joints are not to be cut out with power tools – use hand tools only, unless otherwise noted or approve.

.3 All mortar should be removed on the masonry surfaces to a square surface of existing mortar at the back of the joint.

.4 All loose particles in the mortar joints shall be removed with compressed air and left open for review by the Consultant.

.8 Damage

.1 The Contractor shall take all reasonable precautions in order to prevent damage to the masonry units resulting from the removal process.

.2 Such damage to the masonry includes but is not limited to the widening of the joints, nicks, gouges, and chipped or scratched surfaces from the cutting out tools due to improper workmanship.

.3 The Contractor shall replace or repair all damaged units to the satisfaction of the Consultant with no change in the contract price or schedule.

.9 Depth of Raking

.1 The depth of the raking shall be carried out to at least twice the width of the joint to a minimum depth of 25mm (1") measured from the face of the masonry unit and beyond the existing depth of repointing.

.10 Cleaning of Joint

.1 With brush and medium-pressured compressed air clean joints of debris.

3.6 **BACK POINTING OF JOINTS**

.1 Obtain written acceptance from the Consultant of the rakedout work prior to commencing with pointing operations.

.2 Where the cut-out joints are deeper than raking out depths specified, back point joints to bring the mortar face to the specified depth for raked out joints in preparation of finish pointing. Fill with mortar voids that cannot be filled with conventional back pointing.

.3 Clean by mechanical fan blower surfaces of joint while not damaging the texture of the exposed joints.

.4 Immediately prior to pointing, thoroughly wet the joints in order to control absorption.

.5 Allow water to soak into masonry and mortar, leaving no standing water but remaining wet. Should the surfaces dry prior to pointing, the joints should be wet.

.6 For back pointing, fill all joints full with pointing mortar. Compact the mortar firmly into the joints to ensure positive adhesion to all inner surfaces. Place mortar in layers, with a maximum depth of 13mm (1/2"). Each layer should be set to thumb print hard before placing the next layer. Bring the face of the mortar in back pointed joints to the specified depth for raked out joints, measured from the face of the masonry unit. Leave the joint ready for the final pointing.

.7 Prevent the mortar from being placed or smeared onto the face of the masonry to minimize the potential for staining during back pointing.

.8 Keep the work area clean; remove all droppings as the work proceeds, and again at the end of each day.

3.7 **POINTING OF JOINTS**

.1 Obtain the Consultant's written acceptance of raked out and back pointed work prior to commencing with the pointing operation.

.2 Prevent the mortar from being placed or smeared on to the face of the stone to minimize the potential for staining on the faces during the pointing.

.3 Clean by mechanical fan blower surfaces of joint while not damaging the texture of the exposed joints.

.4 Immediately prior to pointing, thoroughly wet the joints in order to control absorption.

.5 Allow water to soak into masonry and mortar, leaving no standing water but remaining wet. Prior to pointing, the joints should be wet.

.6 Fill all bed and head joints full with pointing mortar, compact joints firmly to ensure positive adhesion to all inner surfaces.

.7 Thoroughly compact the mortar into the joints.

.8 At initial set, finish neatly the joints to match the existing pointing style. Do not over work joints.

.9 Head joints to be tooled first.

.10 Completely fill joint with mortar.

.1 If surface of masonry units has worn rounded edges keep pointing back [1] mm from surface to maintain same width of joint

.2 Avoid feathered edges.

.3 Pack mortar firmly into voids and joints, ensuring full contact with back and sides of joint and leaving no voids.

.11 Build-up pointing in layers not exceeding 25 mm in depth.

.1 Allow each layer to set before applying subsequent layers.

.2 Maintain joint width.

.12 Tool joints to match existing profile.

.1 Tool, compact and finish using mason's slick to force mortar into joint.

.2 Ensure jointing tool fits within width of joint. Use tools of varying widths to meet this requirement.

.3 Provide final exposed aggregate texture when mortar has dried to thumb-print hardness by striking surface of joint with a stiff bristle brush.

.4 Remove excess mortar from masonry face before it sets.

.13 Keep the work area clean; remove all droppings as the work proceeds, and again at the end of each day.

.14 Protection at Completion

.1 Cut out and replace all joints that dry prematurely and are lighter than the surrounding joints and have shrinkage cracks.

.15 Upon daily completion of pointing, cover exposed areas of new work with canvas and secure to prevent lifting during high winds to ensure appropriate curing times.

3.8 PROTECTION DURING CURING PROCESS

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

.2 Membranes should extend to 0.5 m over surface area of work and be tightly installed to prevent finished work from drying out too rapidly.

.3 Cover with waterproof tarps to protect newly laid mortar from frost, rainfall and rapid drying conditions such as wind.

.4 Maintain tarps in place for minimum of 2 weeks after repointing.

.5 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.6 Anchor coverings securely in position.

.7 Damp cure:

.1 Provide damp cure for back pointing and finish pointing mortars, at a minimum temperature of 10 degrees C.

.2 Install and maintain wetted burlap protection during the curing process, using heavy and tight-woven burlap: Minimum 7 days.

.3 Wet mist burlap only - ensure no direct spray reaches surface of curing mortar.

.4 Ensure burlap is not in contact with masonry. Leave air space of minimum [50] mm between burlap and masonry.

.5 Shade areas of work from direct sunlight and maintain constant dampness of burlap.

.6 Provide for off-hours and week-end work as required to maintain specified curing conditions.

.8 Protect from drying winds. Pay particular attention at corners of structure.

.9 Maintain ambient temperature of minimum 10 degrees C after repointing masonry for:

.1 Minimum 30 days in cold weather conditions using dry heated enclosures.

1.1 **FIELD QUALITY CONTROL**

.1 All shop and field materials and workmanship shall be subject to review by the Owner or the Owner's Representative at all times. These reviews shall not relieve the Contractor from the obligations to provide materials conforming to all requirements of the contract documents.

.2 Promptly remove any defective, damaged, or otherwise rejected material from the site. Installed materials which are damaged, or which in the opinion of the Owner do not conform to the contract documents, shall be removed and replaced with acceptable material at no additional cost to the Owner.

1.2 **CLEANING**

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

.2 Clean masonry as work progresses using soft, clean cloths within few minutes after being placed. Upon completion, when mortar has set, so that it will not be damaged by cleaning, clean with soft sponge or brush and clean water. Polish with soft, clean cloths.

.3 All holes in the mortar joints shall be filled with mortar and tooled.

.4 Dry brush the masonry surfaces at the end of each days work and after the final pointing.

.5 Completed wall sections to be washed down from top to bottom once pointing hardens. Allow 3 days for initial hardening of mortar.

.6 Remove all equipment and materials from the site upon completion of the work. Surfaces damaged during the course of the work shall be replaced by the Contractor at no cost to the Owner.

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

.8 Obtain approval of Consultant prior to using other cleaning methods for persistent stains.

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

.10 To be read in conjunction with section Mortars 04 03 08.

1.3 **PROTECTION OF COMPLETED WORK**

.1 Protect adjacent finished work against damage which may be caused by on-going work.

END OF SECTION

1. General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.1 **SCOPE OF WORK**

.1 Mortars for pointing of deteriorated mortar joints.

.2 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately but will be considered incidental to work of this section.

.3 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing flashings and finishes to accommodate the masonry repairs.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

1.2 **REFERENCES**

.1 ASTM C 5-[10], Standard Specification for Quicklime for Structural Purposes.

.2 ASTM C 144-[11], Standard Specification for Aggregate for Masonry Mortar.

.3 ASTM C 185-[15a], Standard Test Method for Air Content of Hydraulic Cement Mortar.

.4 ASTM C 207-[06(2011)], Standard Specification for Hydrated Lime for Masonry Purposes.

.5 ASTM C 260/C 260M-[10a (2016)], Standard Specification for Air-Entraining Admixtures for Concrete.

.6 ASTM C 270-[14a], Standard Specification for Mortar for Unit Masonry.

.7 ASTM C 780-[15a], Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.

.8 ASTM C 1072-[13e1], Standard Test Method for Measurement of Masonry Flexural Bond Strength.

.9 CSA A23.1/A23.2-[09 (2014)], Concrete Materials and Methods of Concrete Construction/Test Methods and Standard Practices for Concrete.

.10 CAN/CSA-A179-[14], Mortar and Grout for Unit Masonry.

.11 CAN/CSA-A3000-[13], Cementitious Materials Compendium (Consists of A3001, A3002, A3003, A3004 and A3005). Annotated specifications for Restoration of Historic Masonry (Ministry of Citizenship and Culture, Province of Ontario, Toronto, Canada, 1985)

1.3 **QUALITY ASSURANCE**

.1 Perform the work in accordance with CAN 3-A370 and CAN3-A371.

1.4 **QUALIFICATIONS**

.1 All work to be completed by qualified and experienced trades people with minimum of ten (10) years' experience in the type of work specified. Experience should include working on heritage buildings, where integrating into existing masonry was required.

.2 All work to be executed under the direction and continuous supervision of qualified mason.

.3 One experienced and competent mason will be in charge of all mortar mixing for the duration of the work.

.4 Use single masonry Contractor for all masonry work.

1.5 **PERFORMANCE REQUIREMENTS**

.1 Average mortar compressive strengths (after 28 days cured)

.1 M type – 17.2 MPa

.2 S type – 12.4 MPa

.3 N type – 5.2 MPa

.4 O type – 2.5MPa

.5 K type – 0.5MPa

.2 If mortar fails to meet 7 day compressive strength requirements, but meets 28 day requirements, it is to be accepted. If mortar fails to meet 7 day compressive strength requirements, but strength at 7 days exceeds two thirds value required for 7 day strength, the Contractor may elect to continue work at their own risk, while waiting results of 28 day test, or opt to take down work affected and redo the work.

1.6 **SUBMITTALS**

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for mortar and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Prior to mixing or preparation of mortars submit for review to consultant confirmation of source or product data sheet of:

.1 Premixed products.

.2 Samples:

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

.3 Sample of freshly broken non-weathered mortar from original masonry pointing.

.4 Sample mortar patties for matching with original mortar.

.5 Approved sample will become standard material. Substitutions are not to be made unless written approval is provided by the Consultant.

1.7 **MOCK-UP**

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

.2 Provide sample of pointing mortar proportioned to represent the final mix formula and amount of pigment one (1) week prior to commencing with the work at a location agreed with the Consultant to show the mortar colour, aggregate proportions and tooling of the

mortar joints. The mock-up shall be at least 1m by 1m in area. And cured to reflect final appearance.

.3 Notify Consultant 24 hours before commencing mock-up.

.1 Obtain approval from consultant before commencing mock-up.

.4 Allow 24 hours for inspection of mock-up before proceeding with work.

.5 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.6 The Contractor must receive written confirmation of the mock-up acceptance prior to commencing with the work.

.7 Approved mock-up shall serve as the standard to which all related work will be evaluated.

.8 Rejected mock-ups will be removed and disposed of at the expense of the Contractor.

1.8 **DELIVERY, STORAGE AND PROTECTION**

.1 Provide weather protection and construction protection in accordance with CAN3-S304.

.2 Store cementitious materials in accordance with CSA-A23.1/A23.2.

.3 Store aggregate in accordance with A179-94.

.4 Keep the materials dry and protected from the weather, freezing and contamination.

.5 Ensure that the labels and seals on all materials are intact upon delivery.

.6 Remove rejected, deteriorated, frozen or contaminated materials from the site.

1.9 **WARRANTY**

.1 The Contractor shall submit a warranty of the work of this section covering a period of not less than two (2) years from the date of Substantial Performance of the Contract. Substantial completion shall be determined by the Consultant and the Owner.

.2 Defective work shall include, but is not limited to, cracking, crumbling, loss of adhesion, loss of cohesion, discolouration, premature deterioration and out of plane movement.

1.10 **ENVIRONMENTAL REQUIREMENTS**

.1 Execute the work when the ambient temperature is above four (4) degrees Celsius. When the ambient temperature is below four (4) degrees Celsius, use care and heat as directed by the Consultant.

.2 When temperature is below zero (0) degrees Celsius or below five (5) degrees Celsius and falling - no mortar is to be placed in open air.

.3 Refer to sections 3.4 and 3.5 for cold and hot weather protection.

1.11 **ALTERNATIVES**

.1 Alternative products may be accepted. Alternatives to be formally submitted for review by the Consultant. Alternatives cannot be used until written approval has been provided by the Consultant.

2. Products

2.1 **MATERIALS**

.1 Water: to be potable and free of salts and other impurities.

.2 Pre-bagged bedding mortar

.1 HLM 500, King Packaged Materials Company.

.2 XhN-101, Daubois.

.3 Pre-bagged pointing mortar

.1 HLM 350, King Packaged Materials Company.

.2 XhN-60, Daubois.

.4 The colour of the mortar shall match the existing. Colouring pigments shall be used in accordance with the manufacturer's written recommendations.

3. Execution

3.1 **EXAMINATION**

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.3 The Contractor shall commence with the pointing upon receipt of approval by the Consultant in writing.

3.2 **PREPARATION**

.1 Ensure protection is installed in mortar mixing area to avoid marking or damage due to the work.

.2 Mortar mix station to be set-up to ensure secure, dry area for materials, and clean and protected area for mixing.

.3 Premixed Mortar:

.1 Follow manufacturer's written instructions.

.2 Whole bag has to be prepared.

3.3 **COLD WEATHER PROTECTION**

.1 In ambient temperature below 4 deg C (40 deg F), use heat and maintain temperature of masonry materials. Protect completed work from freezing to satisfaction of the Consultant. Heat and maintain temperature of masonry materials to at least 4 deg C (40 deg F), but not more than 48 deg C (120 deg F), and maintain air temperature above 4 deg C (40 deg F) on both sides of masonry for period of at least 72 hours.

.2 Do not use scorched sand. Do not use salts or anti-freezes. Use approved smokeless heaters.

.3 Heat water to a minimum temperature of twenty (20) degrees Celsius and a maximum of thirty (30) degrees Celsius.

.4 Use warm water and use less mix water in winter; cover sand to keep dry; heat sand and ensure no frozen lumps; use small batches; provide temporary heat and weather protection enclosure at area of masonry work; cover top of all unfinished work to prevent water or ice getting into masonry work.

.5 When the temperature is ten (10) degrees Celsius or less, store cements and sands for immediate use within a heated enclosure. Allow these materials to reach a minimum temperature of ten (10) degrees Celsius or a temperature that is in equilibrium with the air in the enclosure.

.6 At the time of the use, the temperature of the mortar is to be a minimum of fifteen (15) degrees Celsius and a maximum of thirty (30) degrees Celsius.

3.4 **HOT WEATHER REQUIREMENTS**

.1 Do plan for hot weather construction. Protect freshly pointed areas from drying too rapidly, by means of waterproof, non-staining coverings.

.2 No masonry work to be completed at temperatures above twenty-seven (27) degrees Celsius unless work area is shaded and new mortar is protected with water-misted burlap.

.3 Do not over mix mortar materials; do not re-temper mortar after 2 hours of use; do not re-temper pigment coloured mortar.

.4 Do not mix cement with water or with aggregate or with water-aggregate mixtures having a temperature higher than thirty (30) degrees Celsius.

3.5 **MIXING**

.1 General:

.1 Use batching box.

.2 Follow proper batching procedure.

.3 Monitor mixing time.

.2 Mortar:

.1 Mix Characteristics:

.1 Pointing mortar: slightly stiffer than bedding mortar with a consistency such that mortar can be hand-formed into a stiff ball.

.2 Record amount of water required to reach this consistency and use for subsequent mixes.

.2 Prepare only enough mortar to be used within two hours. Do not re-temper mortar beyond this time.

.3 Follow manufacturer instructions when premixed mortar is used.

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

3.6 **CONSTRUCTION**

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

3.7 **CLEANING**

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

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 77 00 – Close Out Procedures.

.3 When the joint is thumb print hard, a bristle brush and/or a slightly moistened sponge may be used to finish the joint, partly remove the very thin layer of binder and so expose some of the surface of the aggregate.

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

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

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

3.8 **PROTECTION OF COMPLETED WORK**

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

.2 Enclose and protect work using wetted burlap.

.3 Cover with waterproof tarps to prevent weather from eroding recently laid material.

.4 Maintain tarps in place for minimum of 1 week after laying.

.5 Ensure that bottoms of tarps permit airflow to reach mortar in joints.

.6 Anchor coverings securely in position.

END OF SECTION

1. General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.2 **SCOPE OF WORK**

.1 Restoration of existing woodwork

.2 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately, but will be considered incidental to work of this section.

.3 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing flashings and finishes to accommodate the masonry repairs.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

.5 All work to be completed in accordance with the Health and Safety Guideline for Silica on Construction Projects by Occupational Health and Safety Branch of the Ministry of Labour.

1.3 **REFERENCES**

.1 References and industry standards listed in this Section are applicable to the Work. Unless more restrictive criteria or differing requirements are explicitly stated in the Specifications, or mandated by governing codes or regulations, the recommendations, suggestions, and requirements described in the referenced standards shall be deemed mandatory and applicable to the Work.

1. Comply with the applicable provisions of the "Architectural Woodwork Standards" (First Edition-2009) (AWS) except as otherwise specified herein. References to "Premium", "Custom" and "Economy" Grades herein, shall be as defined in that Standard.

.2 Lumber Standard: AWS Section 3.

.3 Preservative Treatment Standard: American Wood Protection Association Standard (AWPA) U1-02

.4 Architectural Woodwork Institute (AWI) - Architectural Woodwork Quality Standard

.5 American Society for Testing and Materials (ASTM) -E84 Standard Test Method for Surface Burning Characteristics of Building Materials

.6 American National Standards Institute (ANSI) - ANSI A108.1

1.4 **SUBMITTALS**

.1 Not used.

1.5 **MOCK-UPS**

.1 For each repair type, construct a typical mock-up one (1) week prior to commencing with the work at a location agreed with the Consultant.

.2 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.3 The Contractor must receive written confirmation of the mock-up acceptance prior to commencing with the work.

.4 Approved mock-up shall serve as the standard to which all related work shall be evaluated.

.5 Rejected mock-ups will be removed and disposed of at the expense of the Contractor.

1.6 **QUALIFICATIONS**

.1 The fabrication and install of new woodwork shall be a company specializing in woodwork with a minimum of ten (10) years proven experience for projects of similar size and complexity.

.2 The wood restoration shall be completed by a company specializing in wood restoration work with a minimum of ten (10) years proven experience for projects of similar size and complexity.

.3 Use single wood restoration company for all wood restoration work.

1.7 **DELIVERY, STORAGE AND PROTECTION**

.1 Store materials and completed fabricated wood items in a dry, well ventilated area completely protected from the weather. Comply with temperature and humidity requirements for storage and installation as specified in the applicable quality standards.

.2 Protect sanded and prefinished surfaces during handling and installation. Keep such surfaces covered with polyethylene film or other suitable protective covering.

1.8 **ENVIRONMENTAL REQUIREMENTS**

.1 Environmental Requirements: Maintain constant minimum temperature of 15.5 degrees C and maximum relative humidity of 55 percent in areas to receive the Work of this Section.

1.9 **LEAD-CONTAINING PAINT**

.1 General: Perform all work that disturbs lead-containing paint (LCP), handle all material that involves lead-containing paint, and transport and dispose of all lead-containing paint and residue in compliance with all applicable federal, provincial, and local laws and regulations for identification, removal, labeling, handling, containerization, transportation, and disposal of lead-containing material including, but not limited to, those referenced herein.

.2 Refer to Guidelines for lead-paint abatement, Appendix A in the Contract Documents.

2.0 Products

2.1 **MATERIALS**

.1 Lumber: Kiln-dried to 12 percent average moisture content

.2 Fasteners:

1. Nails, Spikes, and Staples: Size and type to suit application; non-ferrous metal or galvanized steel for exterior locations, high humidity locations, treated wood, and wood to receive transparent finishes.

2. Bolts, Nuts, Washers, Lags, and Screws: Medium carbon steel; size and type to suit application; galvanized for exterior locations, high humidity locations, and treated wood.

3. Anchors: Toggle bolt type for anchorage to hollow masonry; expansion shield and lag bolt type for anchorage to solid masonry or concrete; galvanized steel or stainless steel.

4. Screws: Corrosion resistant self-tapping #8 wood screws. Length to suit application – at least 2 times the thickness of wood being secured.

2.2 **EXTERIOR AND INTERIOR WOOD SPECIES**

.1 Comply with AWS Sections 6 and/or 12 as applicable, and as otherwise specified herein.

.2 Exterior Woodwork:

.1 Restoration: replacement wood to match existing in species, grade and cut.

.2 For existing wood restoration the intent is that all existing woodwork will be repaired and replaced, where necessary. If required, new wood shall be used to replace the existing at the direction of the Consultant. All replacement material shall match the existing wood species, grade and cut.

.3 Interior Woodwork:

.1 New: American Yellow Poplar, paint grade

2.3 **GENERAL**

.1 Lumber shall be of sound stock, solid wood without finger joints or other joints within members, thoroughly seasoned, and kiln-dried to a moisture content not exceeding 8 percent.

.2 Wood shall be free from defects or blemishes on surfaces exposed to view that will show after paints and finishes have been applied. Materials that do not comply with specifications for quality and grade, are in any way defective, or are otherwise not in proper condition will be rejected.

.3 Preservative treatment shall be used for new wood after machining.

.4 Finger-jointed stock may be used for interior casing and trim only where scheduled to be painted.

2.4 **WOOD ELEMENT TOLERANCES**

.1 Tolerance on any face dimension is + or – 1 mm.

.2 Tolerance on thickness is + or – 1 mm.

.3 Maximum variation from true plane on flat surface is 0.8 mm.

.4 Maximum variation on edge straightness is 0.8 mm.

2.5 **ADHESIVES**

.1 Adhesive for Dutchman Repairs: two-part, low-viscosity liquid epoxy, designed for use with wood. Such as G2 glue manufactured by System Three or approved equivalent.

.2 Adhesive for wood plugs and thin Dutchmen: use an adhesive with some flexibility. Titebond II or III manufactured by Franklin International or approved equivalent.

2.6 **RESTORATION**

.1 Boiled linseed oil

2.7 **FABRICATION**

.1 Mill assemble items to largest sizes practicable, to minimize field cutting and jointing. Allow for cutting and fitting where necessary to fit at the Site.

3.0 Execution

3.1 **EXAMINATION**

.1 Verification of Conditions: Examine substrate conditions and surfaces upon which finish Work is to be installed. Do not proceed with finish Work until unsatisfactory substrate conditions are corrected.

3.2 **PREPARATION**

.1 Condition the Work of this Section to average prevailing humidity conditions in installation areas prior to installing.

3.3 **EXISTING WOOD REHYDRATION**

.1 Sand finish off existing wood window elements to bare wood.

.2 Clean and prep wood for application of linseed oil where wood is dry and requires re-moisturizing prior to finish application. Allow for 2 coat application on 25% of the window elements.

.3 Linseed oil to cure for specified time as per manufacturer's instructions.

.4 Prep and apply 2 coats clear urethane finish, sanding prior to each application.

3.4 **MINOR WOOD REPAIRS**

.1 Repair small holes and small areas of damage found on the wood surfaces using a round wood plug repair.

.2 Wood used for this type of repair to match the existing wood species and grain orientation it is to be installed into.

.3 Size of repairs should range from 5 to 25 mm in diameter. The smallest possible diameter should be used for each repair to ensure that the maximum original materials are being retained.

.4 Glue in repairs using specified glue. Hand plane or chisel off excess wood.

.5 Sand area until even surface for proper application of finishes.

3.5 **DUTCHMAN REPAIRS**

.1 General: Provide dutchman repairs where wood is structurally compromised. Wood repairs will not be made for aesthetic purposes. The repairs shall provide continuous smooth surfaces matching planes and profiles of wood members being repaired. The replacement piece shall match wood being repaired in species and cut.

.2 Preparation: Neatly cut out existing opening as required to provide a prismatic void. Wherever possible create voids that will provide mechanical attachments as in dovetails. The amount of wood removed should be minimized but the amount should include all damaged wood and extend just past damaged wood to prevent spread of any fungus contained therein. Cut away area will provide ample glue surface.

.3 Dutchman: Cut dutchman to exactly fit void, with exposed portion matching original profile of woodwork and just slightly proud of original surface. Orient grain of dutchman parallel to grain of element being patched. Where deterioration or loss at end of

component requires dutchman repair, use a diagonal scarf joint for end-to-end joint between dutchman and remaining portion of component.

.4 Installation: Clean glue surfaces with acetone or denatured alcohol. Insert dutchman using specified adhesive and clamp in place until glue is set. Where clamping is not feasible, use small brads; remove brads and fill holes after adhesive has set.

.5 Surfacing: Plane or scrape dutchman to provide smooth continuous surface coplanar with adjacent wood. Do not damage or alter profile or finish of adjacent wood.

3.6 **THIN WOOD DUTCHMAN REPAIRS**

.1 Clean out large cracks or checks. Use thin metal scrapers to dig any embedded particulates out of the cracks.

.2 Clean area using oil free compressed air.

.3 Mask areas to avoid glue run off.

.4 Shape replacement piece of wood to size while ensuring that new piece matches species and grain orientation.

.5 Glue wood into place using specified glue.

.6 Hand plane or chisel off excess wood.

.7 Sand area until even surface has been attained to allow for proper application of finishes.

3.7 **NEW WOOD INSTALLATION**

.1 Install the Work plumb, level, and free of distortion. Shim where required, with concealed shims.

.2 Cut wood items to fit. Scribe and cut for accurate fit where Work abuts other finish Work. Drill pilot holes at corners before making cut outs.

.3 Distribute defects to the greatest appearance advantage possible

.5 Do not allow kerfing on faces of trim or moldings.

.6 Attach the Work securely in place.

.1 Nailing: Blind nail where possible. Use finishing nails where exposed. Set nail heads for filling.

.2 Anchoring: Secure the Work to anchors or to blocking which is built-into or directly attached to substrates.

3.8 **PROTECTION**

.1 Protect installed Work from damage by Work of other trades. Maintain temperature and humidity requirements during the construction period in interior installation areas.

3.9 **CLEANING**

.1 Clean exposed surfaces of prefinished Work.

END OF SECTION

1. GENERAL

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1

1.2 **SCOPE OF WORK**

.1 Restoration of the clay tile roof.

.2 Salvage of existing clay tile for reinstallation.

.3 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authourization from utilities, protection, etc. The cost associated with these items will not be paid for separately but will be considered incidental to work of this section.

.4 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing woodwork and finishes to accommodate the slate replacement.

.5 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

1.3 **REFERENCES**

.1 ASTM standard C1167.

1.4 **SUBMITTALS**

.1 Two (2) weeks prior to commencing with the work, provide access shop drawings (i.e. scaffolding) as required to access the full roof area to carry out the work. As required shoring shop drawings shall be provided to confirm that the bearing capacities of supporting existing structures is adequate. All shop drawings are to be stamped and signed by a Profession Engineer licensed to practice in the Province of Ontario.

.2 Product Data: Submit catalogue sheets, specifications, and installation instructions for the following:

.3 Sample: Clay tile matching the existing in form, dimension, colour and quality.

.4 Provide example of proposed cataloguing and labeling method for salvaged clay tile to consultant for review prior to tile removal. Removal of tile to not commence until written approval has been provided by the consultant.

.5 Shop Drawings: Submit complete shop drawings including roof plan showing jointing methods and location of flashings, and large scale details of all flashing conditions. Indicate all dimensions and materials.

.6 Material Test Reports: For each slate type, performed by a qualified testing laboratory, per ASTM C406

.8 Distributor's Warranties: Distributors warranty for clay tile specified.

.9 Installer's Warranties: Installers warranty for work specified.

.10 Installer's Qualifications: Installer's roofing with clay tile project references; not fewer than four.

1.5 **QUALITY ASSURANCE**

.1 Installer Qualifications: Company experienced in installing traditional clay tile roofing of the type and scope specified in this section and employing persons with not fewer than

five (5) years of documented experience. Company shall provide skilled workers, thoroughly trained and experienced in the necessary crafts of clay tile roof systems and who are familiar with this specification and methods required for a warrantable roof. The skills of individuals will be subject to review and acceptance by the Consultant. Review will include production of basic mock-ups for all types of work specified.

.2 Workers shall be supervised by a foreman having minimum five (5) years of experience with traditional clay tile roofing work.

.3 Provide a list of the proposed workers a minimum one week prior to commencement of the work.

.4 No workers shall be changed during the progress of the work without written acceptance by the Consultant.

.5 Pre-roofing Conference: At the option of the Client, before the roofing Work is scheduled to commence, a conference will be called by the Client's Representative at the site for the purpose of reviewing the Drawings and the Specifications and resolving all questions before actual Work is started. The conference shall be attended by the Contractor and the approved slate roofing applicator.

1.6 **MOCK-UP**

.1 Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

.1 Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by consultant in writing.

.2 Install in area and of size designated by consultant.

.3 Do not proceed with remaining work until finish color, texture, pattern, joint sizes, and installation workmanship are approved by consultant.

.4 Correct mock-up area as required to produce acceptable work.

.5 Mock-up may be incorporated into final construction upon consultant’s approval.

1.7 **DELIVERY, STORAGE AND PROTECTION**

.1 Deliver clay tiles to project site in distributor's crates/pallets, labeled with data indicating source.

.2 Store and handle in strict compliance with manufacturer's written instructions and recommendations.

.3 Protect from damage due to weather, excessive temperature, and construction operations.

.5 Handle clay tiles to prevent chipping, breakage, soiling, or other damage. Protect edges with wood or other rigid material.

.6 Place and stack crates/pallets to distribute weight evenly and to prevent breakage or cracking.

.5 Stage roofing materials on the building in a manner to avoid significant or permanent damage to the roof deck or structural supporting members.

.6 Scaffolding, rigging or other apparatus employed by applicator should when removed, leave little or no trace of its presence and not compromise in any way weather tightness of roof or sidewall.

1.8 **WARRANTY**

.1 Clay Tile Distributors Warranty: Submit distributors warranty, signed by the distributor and covering the clay tile described in this section, in which the distributor agrees to replace clay tiles that fail in materials.

.2 Roofing Installer's Warranty: Submit roofing installer's warranty, signed by roofing Installer and covering Work of this Section, in which roofing Installer agrees to repair or replace roofing that fails in materials or workmanship within the following warranty period. Defects shall include breakage, slippage, and falling of shingles during this period.

.1 Warranty Period: Five years from date of Substantial Completion.

.3 Should any defects or leaks occur during the period of guarantee, such defects or leaks shall at once be remedied and all damage caused by such defects or leaks shall be repaired and made good without cost or expense to the Authority. Provide yearly inspections during the 5 year period and replace fallen tiles during this period.

.4 In the event of failure on the part of the Contractor to commence within three (3) days after the notification by the Authority, any work required to be performed under the terms of the aforesaid guarantee, and to complete the same within a reasonable time thereafter, the Authority may have such work done by other parties and charge the cost thereof to the Contractor and the Surety herein.

.5 The Performance Bonding Company's guarantee shall be for the entire five (5) years guarantee period.

1.11 **EXTRA MATERIALS**

.1 Provide an additional 3 percent of installed clay tiles for Owners use in roof maintenance.

1.12 **ENVIRONMENTAL REQUIREMENTS**

.1 General:

.1 All work shall be performed in strict accordance with manufacturer’s written requirements for all products specified in the specification.

.2 Should a conflict arise between the requirements of this section and the manufacturer’s requirements, the more stringent requirements shall govern.

1.13 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials appropriately.

.2 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials. Labelling and provision of MSDS sheets shall be acceptable to Labour Canada.

.3 Ensure that all materials, containers, rags, etc. are disposed of in accordance with the local Waste Management Plan and hazardous material disposal regulations and requirements.

1.14 **PRE-CONSTRUCTION MEETING**

.1 Prior to work commencing the Owner, Contractor and Consultant will meet on site to review scope of work and procedures.

2 PRODUCTS

2.1 **CLAY TILE**

.1 Style: Ludowici Spanish “S”

.2 Colour, shape and texture: to match existing.

.3 Thickness: to match existing.

.4 Size: to match existing.

.5 Grade 1 tile, for maximum frost resistance.

2.2 **UNDERLAYMENT**

.1 Refer to section 07 52 00 Roofing Membranes

2.3 **ACCESSORIES**

.1 Bedding mortar: Type S

2.4 **FLASHING FABRICATION**

.1 Refer to section 07 62 00 Sheet Metal Flashing and Trim

3 EXECUTION

3.1 **EXAMINATION**

.1 Notify consultant when one roof face of tile has been removed for review and confirmation of existing roof installation method.

.2 Verify that deck surfaces are sound, smooth, properly secured; and free of ridges, depressions and voids; properly sloped and dry.

.2 Verify that roofing penetrations are in place and properly flashed to deck surface.

.3 Proceed with installation only after unsatisfactory conditions have been corrected.

.4 Proceeding with the installation acknowledges the acceptance of the sub-roof condition.

3.2 **STRIPPING OFF EXISTING FINISHES**

.1 Remove existing roof finishes, flashings, underlay and slip sheets without damage to existing sheathing and roof structure.

.2 Carefully remove all existing clay tiles for salvage, and reinstallation. Clay tile to be labelled for reinstallation in same location as found, protected and stored in manner to protect them from damage, and weather until the roof is ready for reinstallation of the salvaged tiles.

.3 Contractor to photograph each tile with label and provide catalogue for consultant review after removal and prior to reinstallation.

.4 Label tile in a manner to not stain or leave markings on the visible side of the tile.

.3 Ensure finished surface is continuous smooth and free of gaps.

3.3 **PREPARATION**

.1 Broom clean deck surfaces prior to installation of underlayment.

3.4 **INSTALLATION**

.1 Proceed with installation only after written approval and acceptance of all materials and accessories has been issued by the consultant.

.2 Install underlayment, ice and water shield and flashing components as required and specified prior to clay tile installation.

.3 Installation of clay tile is to match the existing roof in coursing, securing method, profile tile locations and pattern.

.4 Tiles to be embedded in mortar for securing.

3.5 **PROTECTION**

.1 Minimize traffic over finished roof surface.

.2 Ensure roof is protected adequately until full roof installation is complete.

3.6 **CLEANING**

.1 Remove all equipment and materials from the site upon completion of the work. Surfaces damaged during the course of the work shall be replaced by the Contractor at no cost to the Owner.

END OF SECTION

1 GENERAL

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1

1.2 **SCOPE OF WORK**

.1 Roofing membrane for full clay tile roof replacement.

.2 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authourization from utilities, protection of adjacent wall and roof areas, etc. The cost associated with these items will not be paid for separately, but will be considered incidental to work of this section.

.3 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing systems.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

1.3 **REFERENCES**

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

.2 CAN/CGSB 51.33-M89: Vapour Barrier Sheet, Excluding Polyethylene, for use in Building Construction.

.3 CAN/CGSB 51.34-M86: Vapour Barrier, Polyethylene Sheet, for use in building construction.

.4 Complies with AC-188 Acceptance Criteria for Roof Underlayments.

.5 Complies with ASTM E108/UL 790 for use in the installation of Class A asphalt glass fiber mat shingles and Class C asphalt organic felt or metal shingles.

.6 Meets ASTM D226 physical requirements of Type I and Type II.

1.4 **SUBMITTALS**

.1 Submit manufacturer's Product data in accordance indicating the products characteristics, performance criteria, and limitations. Indicate surface preparation requirements, installation requirements and techniques, product storage, and handling criteria.

.2 Submit the information directly to the Consultant.

1.5 **QUALITY ASSURANCE**

.1 Perform Work in accordance with product manufacturers instructions. Maintain Manufacturer’s installation guides on-site.

1.6 **DELIVERY, STORAGE AND PROTECTION**

.1 Provide weather protection and construction protection in accordance with CAN3-S304.

.2 Keep the materials dry and protected from the weather, freezing and contamination.

.3 Ensure that the labels and seals on all materials are intact upon delivery.

.4 Remove rejected or contaminated materials from the site.

1.7 **ENVIRONMENTAL REQUIREMENTS**

.1 All work shall be performed in strict accordance with manufacturer's written requirements for all products specified in the specification.

.2 Should a conflict arise between the requirements of this section and the manufacturer's requirements, the more stringent requirements shall govern.

1.8 **EXISTING CONDITIONS**

.1 The Contractor shall provide all required support to safely support all the loads.

.2 Report, in writing to the Consultant, any conditions which will adversely affect the work of this section.

1.9 **ALTERNATIVES**

.1 Alternatives to manufacturer's brands or supply sources of materials can be submitted for review and approval by consultant. Information about the alternative material; manufacturer's Product data indicating the products characteristics, performance criteria, and limitations, to be formally submitted. Alternatives are not to be used unless written approval has been provided by the Consultant.

2 PRODUCTS

2.1 **MEMBRANES**

.1 Modified bitumen membrane reinforced with skid resistant polyethylene surface film, self-adhesive type membrane. Minimum thickness 40 mils.

i. Acceptable Products:

a. Underlayment - Tri-Flex 15 Synthetic Underlayment as manufactured by GCP Applied Technologies. Or approved alternative.

b. Ice and Water Shield - Blueskin RF200 Ice and Water Barrier by Henry or an approved alternative.

2.2 **ACCESSORIES**

.1 Lap End Seals: Polybitume 570-05 Polymer Modified Sealing Compound or HE925 BES Sealant, by Henry. All seams in waterproofing membrane to receive flashing sealant. OR approved alternative.

.2 Cap staples

3 EXECUTION

3.1 **EXAMINATION**

.1 Verify that surfaces and conditions are ready to accept the work of this section.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

3.2 **PREPARATION**

.1 Protect adjacent finished materials from marking or damage due to the work.

.2 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar, corrosion by-product or other contaminants.

.3 Install temporary shoring, bracing or other supports as necessary to support loading in the area of work.

.4 Incomplete areas of work shall be completely covered and protected with non-staining waterproofing covers when the construction is not in process.

3.3 **PROTECTION**

.1 The membranes specified in this section are not designed for permanent exposure. Ensure that membranes are covered promptly after completing the work.

.2 Contractor must maintain the roof is watertight at all times to prevent moisture penetration. The Contractor shall be responsible for all costs associated with damage associated with moisture penetration resulting from inadequate protection as determined by the Consultant.

3.4 **ICE AND WATER BARRIER/SELF ADHERING MEMBRANE INSTALLATION**

.1 Apply the membrane at all ridges, valleys and eaves for 3'-0" width to the prepared substrate in an overlapping shingle fashion, and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.

.2 Align and position the membrane, remove protective film and press firmly in place. Ensure a minimum of 2" (50mm) overlap at all end and side laps. Promptly roll all laps and membrane with a counter top roller to promote adhesion.

.3 At the end of each days work, seal the top edge of the membrane where it meets the substrate using the flashing sealant or as recommended by the manufacturer.

3.5 **ROOF UNDERLAYMENT**

.1 The roof deck must be swept clean and be smooth and dry before installation begins.

.2 Lay underlayment horizontally (parallel to eave), starting at the bottom of the roof, with printed side up and with 4-inch side laps and 6-inch end laps. Side laps run with the flow of water in a shingling manner.

.3 The underlayment according to manufacturer's specifications.

.4 The underlayment is attached to the roof with roofing nails or staples both having 1-inch diameter plastic/metal caps, spaced at 8 inches on center (oc) on both side and end laps in normal wind zones. In high wind zones or coastal applications, double the fastening to 4 inches oc. In all cases fasten at 24 inches oc down the middle of the roll in the field of the roof. Fasteners may be hand or machine applied. Staples without caps cannot be used.

.5 Where seams or joints require sealant or adhesive, use a high quality, low solvent, asbestos free plastic roofing cement meeting ASTM D4586 Type 1, Federal Spec SS-153 Type 1 (Asbestos Free). Consult your local GCP representative for more details.

.6 Install drip edge at eaves under underlayment and at rake over underlayment.

.7 Installation of the roof covering can proceed immediately following underlayment application. The installation of the final roof covering should take place within 60 days.

.8 For additional protection lay a single length of underlayment vertically in valleys and on hips prior to installing metal flashings and before installing horizontal underlayment.

3.6 **CLEANING**

.1 Daily as the work proceeds and on completion, remove all surplus materials and debris resulting from the foregoing work.

END OF SECTION

1 General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.2 **PRE-START HEALTH AND SAFETY REVIEW**

.1 Provide a Pre-Start Health and Safety Review in accordance with the Occupational Health and Safety Act (Ontario), Regulation 851, as amended.

1.3 **SCOPE OF WORK**

.1 All flashings related to the full roof replacement.

.2 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately but will be considered incidental to work of this section.

.3 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing flashings and finishes to accommodate the masonry repairs.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

1.4 **REFERENCES**

.1 American Society for Testing and Materials (ASTM)

.1 ASTM B 370-98 - Specification for Copper Sheet and Strip for Building Construction.

.2 ASTM B 32-96, Standard Specification for Solder Metal

.3 ASTM C406 / C406M - 10 Standard Specification for Roofing Slate

.2 Copper Development Association (CDA)

.3 Copper Architecture Handbook, December 1996.

.4 Canadian Roofing Contractors Association (CRCA)

.1 Roofing Specifications Manual

.5 Canadian Standards Association (CSA)

.2 CSA B111 - Wire Nails, Spikes and Staples

.3 CAN/CGSB-51.32 - Sheathing, Membrane, Breather Type

.4 CAN/CGSB-93.1 - Sheet, Aluminum Alloy, Prefinished, Residential

.6 Sheet Metal & Air Conditioning Contractors National Association - Architectural Sheet Metal Manual.

1.5 **SUBMITTALS**

.1 Submittals shall meet requirements of Section Submittals 01 33 00.

.2 Submittals to be provided prior to work commencing.

.3 Submit shop drawings to demonstrate the proposed profile, size, dimensions, seams, joints, securing methods, etc.

.4 Submit duplicate 300 x 300mm samples of each type of sheet metal material, colour and finish.

1.6 **MOCK-UP**

.1 Install mock-up to illustrate typical flashing to stone and wood details, and valleys: all joints, fixings and cover flashings.

.2 Mock-ups will be used to judge workmanship, substrate preparation, operation of equipment, types of material and application and conformity of sizes, profiles and details with existing conditions.

.3 Provide 48 hours notice for review by consultant.

.4 Correct mock-ups at Consultant's discretion until required quality of Work is achieved.

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this Work. Approved mock-ups may remain as part of finished Work.

1.7 **STORAGE AND HANDLING**

.1 Prevent contact with materials during storage that may cause discolouration, staining, or damage.

.2 Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation.

.3 Store products in weather protected environment, clear of ground and moisture.

.4 Deliver products in manufacturer's original containers/assembly, dry, undamaged, with seals and labels intact.

1.8 **QUALIFICATIONS**

.1 A recognized specialized fabricator and installer, having at least five (5) years of experience, with skilled mechanics, thoroughly trained and competent in all phases of the work, shall perform the copper work.

1.9 **WARRANTY**

.1 The Contractor shall provide a warranty covering a period of two (2) years for all labour and materials from the date of Substantial Performance of the contract agreeing to furnish sheet metal to repair or replace those that do not comply with performance and other requirements specified in this Section within the specified warranty period.

.2 Defective work shall include, but is not limited to, premature corrosion, warping, failed anchors, fasteners, and welds, and leakage through seams.

1.10 **ENVIRONMENTAL REQUIREMENTS**

.1 Install copper sheeting at ambient temperatures of no less than 5 degrees Celsius, or to joint sealant manufacturer's recommendations.

.2 Underlay membrane shall be covered by copper sheeting within 60 days of its application.

1.11 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate waste materials for reuse and recycling in accordance with applicable regional regulations.

.2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

.3 Separate for reuse and recycling and place in designated containers metal waste in accordance with Waste Management Plan.

.4 Place materials defined as hazardous or toxic in designated containers.

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

.6 Ensure emptied containers are sealed and stored safely.

.7 Divert unused metal materials from landfill to metal recycling facility as approved by Owner.

.8 Unused paint, caulking, and sealing compound materials must be disposed of at an official hazardous material collections site as approved by Owner.

.9 Unused paint, caulking, and sealing compound materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.10 Fold up metal banding, flatten and place in designated area for recycling.

2 PRODUCTS

2.1 **SHEET METAL FLASHINGS**

.1 Flashing: CDA 110, ASTM B 370 copper, cold rolled, 16 oz/sq ft (0.56 mm thick), natural finish.

.2 Profile to match existing with hemmed edges, drip edges, and starter strips, etc.

2.2 **JOINTING**

.1 Flat-lock and solder joints when run horizontally.

.2 Lap joints and do not solder vertically.

.3 Jointing and layout is to match the existing exactly, unless original construction is in contravene of current industry standard or best practice. At these locations, the contractor is to advise the consultant and obtain written confirmation prior to proceeding.

2.3 **ACCESSORIES**

.1 Cleats and Starter Strips:

.1 Copper, minimum 50mm (2") wide with bent to accept flashing.

.2 Thickness to be 0.56mm (16 oz/sq ft) and fastened at 300 mm o.c.

.2 Solder:

.1 ANSI/ASTM B32; composition 50% tin and 50% lead.

.3 Flux:

.1 Rosin, muriatic acid neutralized with zinc or approved equal.

.4 Lumber material

.1 Blocking, nailing strips, shimming:

.1 S2S is acceptable

.2 Board and dimension sizes – Standard or better grade.

.3 Preservative pressure treated

2.4 **FASTENERS**

.1 Nails for metal flashing shall be copper, to CSA B111 flat head, wire, barbed, roofing nail type; 32 mm long x 3 mm diameter minimum.

2.5 **FABRICATION**

.1 Fabricate metal flashing work to match approved mock-ups and shop drawings, and in accordance with applicable recommendations and details of CRCA Roofing Specifications, Copper in Architecture Handbook by CDA, and methods of reviewed submittals and mock-ups.

.2 Form pieces in 2400 mm maximum lengths.

.3 Make allowance for expansion at joints.

.4 Hem exposed edges on underside 12 mm. Mitre and weld corners.

.1 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

3 EXECUTION

3.1 **EXAMINATION**

.1 Verify that substrate surfaces are sound, smooth, properly secured; and free of ridges, depressions and voids; properly sloped and dry. Notify Consultant of any defects.

.2 Verify that roofing penetrations are in place.

.3 Proceed with installation only after unsatisfactory conditions have been corrected. Substrates are dry, free of snow, ice or frost and clean.

3.2 **PREPARATION**

.1 Site verify all measurements prior to fabricating work.

.2 Install starter and edge strips, and cleats before starting installation.

3.3 **INSTALLATION**

.1 Ice and Water Shield Installation

.1 Install the membrane where indicated in a shingle fashion in accordance with the Manufacturer's recommendations.

.2 Prime all areas.

.3 Use a heavy steel roller over all areas of the membrane to ensure full contact and full adhesion of the membrane.

.4 Provide 3-inch lap at all seams and 6 inch at all end laps.

.5 Provide a sealant bead at the perimeter of all penetrations.

.2 Breathable Underlayment

.1 Prime the plywood cover board in accordance with the manufacturer's requirements.

.2 Apply the membrane to the prepared substrate in an overlapping shingle fashion, and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.

.3 Align and position the membrane, remove protective film and press firmly in place. Ensure a minimum of 2" (50 mm) overlap at all side laps and 3" (75mm) at all end laps. Promptly roll all laps and membrane with a counter top roller to promote adhesion.

.4 At the end of each days work, seal the top edge of the membrane where it meets the substrate using the sealant or as recommended by the manufacturer.

.5 Provide transitions to each adjacent system as shown on the drawings. Ensure that the breathable underlayment wraps around the eave and ridge, and extends up and onto the parapet. Note that the underlayment acts as a separation sheet for the copper roofing.

.3 General Installation

.1 Provide shop/fabrication drawings to confirm profile, layout, dimension, fabrication, and installation. Plan lengths to maximize sheet lengths and minimize joints. Refer to the drawings for proposed joint locations.

.2 Provide for thermal expansion and contraction of the work. Form joints as shown and as required for leakproof construction. Shop-fabricate materials to greatest extent possible. Do not over crimp the seams.

.3 Protect material from electrolytic action when dissimilar metals are in contact with one another.

.4 Fabricate and install work with lines and corners of exposed units true and accurate. Form exposed faces flat and free of buckles, excessive waves, and avoidable tool marks considering temper and reflectivity of metal. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant. Except as otherwise shown, fold back sheet metal to form a hem on concealed side of exposed edges.

.5 Conceal fasteners and expansion provisions where possible in exposed work, and locate so as to minimize possibility of leakage. Cover and seal

fasteners and anchors as required for a tight installation.

.6 Tin uncoated copper surfaces at edges of sheets to be soldered, for a width of 1-1/2", using solder recommended for copper work. Where surfaces to be soldered are lead- coated, do not tin the edges, but wire brush lead coating before soldering.

.7 Remove protective film (if any) from exposed surfaces of copper roofing promptly upon installation. Strip with care to avoid damage to finishes.

.8 Clean exposed metal surfaces of substances that would interfere with uniform oxidation and weathering.

.4 Flashings and reglets;

.1 Flashing:

.1 Install underlayment under flashings as indicated.

.2 Form cap flashings to shed water.

.3 Use only concealed fastenings.

.4 Fasten cleats and hook strips using specified anchors.

.5 Fold cleat tabs over anchor heads.

.6 Secure flashings in place using specified type fasteners.

.7 Solder joints where indicated; clean and flux joints prior to soldering. Protect underlay membrane as described above.

.8 Lap, lock, seam and seal all joints.

.9 Fit flashings tight in place. Make corners square, surfaces true and straight in planes and lines accurate to profiles.

.2 Reglets:

.1 Verify that reglets to receive flashings have been raked to the correct depth and cleaned. Advise consultant of defects that may affect work.

.2 Insert flashing sheet into reglets to form weather tight junction.

.3 Wedge flashings securely into reglets using lead wool to achieve correct joint depth and shape.

.4 Caulk joints with specified sealant in accordance with manufacturer's written instructions.

.1 Apply sealant in continuous beads.

.2 Apply sealant using gun with proper size nozzle.

.3 Use sufficient pressure to fill voids and joints solid.

.4 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets, embedded impurities.

.5 Tool exposed surfaces before skinning begins to give slightly concave shape.

.6 Remove excess compound promptly as work progresses and upon completion.

.7 Clean adjacent surfaces immediately and leave Work neat and clean.

3.4 **CLEANING**

.1 Daily as the work proceeds and on completion, remove all surplus materials and debris resulting from the foregoing work.

.2 Remove all stains, caulking or other adhesive from all affected surfaces.

END OF SECTION

1 General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.2 **PRE-START HEALTH AND SAFETY REVIEW**

.1 Provide a Pre-Start Health and Safety Review in accordance with the Occupational Health and Safety Act (Ontario), Regulation 851, as amended.

1.3 **SCOPE OF WORK**

.1 At all flashings related to full roof replacement.

.2 Review other Sections of the Specifications for extent of sealant Work specified in those Sections. Provide all other joint sealant materials, equipment and labour necessary to complete the Work of this Section as indicated on the Drawings and specified herein.

.1 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately but will be considered incidental to work of this section.

.2 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

.3 All work to be completed in accordance with the Health and Safety Guideline for Silica on Construction Projects by Occupational Health and Safety Branch of the Ministry of Labour.

1.4 **REFERENCES**

.1 Meet or exceed the following standards or the latest revised versions of same:

a. CAN/CGSB-19.24-M90;

b. CAN/CGSB-19.13-M87;

c. CAN/CGSB-19.13-M87, Classification MCG-2-25-A-L.

d. ASTM C920, Type M, Grade P, Class 25, Use T, M, A and O.

e. ASTM C 510 Standard Test Method for Staining and Color Change of Single- or MulticomponentJoint Sealants.

f. ASTM C 661 Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants byMeans of a Durometer

g. ASTM C 719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint SealantsUnder Cyclic Movement (Hockman Cycle).

h. ASTM C 794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.

i. ASTM C 920 Standard Specification for Elastomeric Joint Sealants.

j. ASTM C 1193 Standard Guide for Use of Joint Sealants.

k. ASTM C 1248 Standard Test Method for Staining of Porous Substrate by Joint Sealants.

l. ASTM C 1311 Standard Specification for Solvent Release Sealants.

m. ASTM D 2203 Standard Test Method for Staining from Sealants.

.1 ASTM D 2240 Standard Test Method for Rubber Property—Durometer Hardness

.2 ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Materials

1.5 **QUALITY ASSURANCE**

.1 Applicators: Member, in good standing, of Sealant and Waterproofing Association. Trained and approved by manufacturer and having a minimum five years' experience in the installation of the Work described in this Section and can show evidence of satisfactory completion of projects of similar size, scope and type.

.2 Pre-installation meeting: Two weeks prior to commencing Work of this Section, arrange for manufacturer's technical representative to visit the site and review preparatory and installation procedures to be followed, conditions under which the Work will be done, and inspect the surfaces to receive the Work of this Section. Advise the Owner of the date and time of the meeting.

.3 Single source responsibility: Use sealants from single manufacturer for each different product required to ensure compatibility.

.4 Provide masking tape and apply to areas to receive primer and sealant Work to avoid staining and soiling of adjacent and existing surfaces. Contractor is responsible for all additional cost and additional time required to clean stained and soiled surfaces resulting from installation Work of this section. When directed by Owner, clean all stained and soiled surfaces immediately and make good existing surfaces with no extra cost to Owner and no increase to Contract Price and Contract Time.

1.6 **SUBMITTALS**

.1 Submittals shall meet requirements of Section Submittals 01 33 00.

.2 Two (2) weeks prior to work commencing provide the specified submittals.

.3 List of materials to be provided under this section.

.4 Manufacturer's Data: Submit manufacturer's literature describing each material to be used in the Work of this Section. Literature to indicate the material complies with the specified standard. Submit product information to contain sealant composition and physical characteristics, surface preparation requirements, priming and application procedures, suitability of sealants for purposes intended and joint design, suitability of sealants for temperature and humidity conditions at time of application.

.5 Sealant manufacturer's written project recommendations.

.6 Samples: Provide cured, colour samples of in each type of sealing and caulking compound specified herein. Submit samples of primer, bond breaker tape and joint backing material.

.7 Safety Data Sheets: Submit WHMIS safety data sheets for inclusion with project record documents. Keep one copy of WHMIS safety data sheets on site for reference by workers.

1.7 **MOCK-UP**

.1 Construct mock-ups two (2) weeks prior to commencement of the work to demonstrate all of the joints encountered in this project.

.2 The mock-ups shall be 1 m in length for each type of sealant and substrate.

.3 The mock-ups shall demonstrate the surface preparation prior to the sealant installation and the location, size, shape, colour, depth of joints, and adhesion and

cohesion, complete with back-up material, primer, and new sealant.

.4 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part ofthe finished work.

.5 The approved mock-up shall be the standard to which all work shall be performed.

.6 The mock-up shall be performed prior to the pre-installation conference.

1.8 **DELIVERY, STORAGE AND HANDLING**

.1 Deliver sealants to site in original sealed containers bearing manufacturer's name, brand name of sealant and reference standard to which sealant complies, expiration period, pot life.

.2 Store materials in a dry area having an ambient temperature within limitations recommended by material manufacturer. Protect from freezing, moisture, and water.

1.9 **PROJECT/SITE CONDITIONS**

.1 Apply sealants only to completely clean and dry surfaces, and at air and material temperatures above minimum established by manufacturer.

.2 Do not apply any sealant under adverse weather conditions, when joints to be sealed are damp, wet or frozen, or when at ambient temperatures below 5 deg C or above 25 deg C. Maintain minimum temperature of application during application and for 8 hours after application. Consult manufacturer for specific instructions before proceeding with the Work.

1.10 **ENVIRONMENTAL REQUIREMENTS**

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials. Labelling and provisionof MSDS sheets shall be acceptable to Labour Canada.

.2 Ensure that all materials, containers, rags, etc. are disposed of in accordance with the local WasteManagement Plan and hazardous material disposal regulations and requirements.

1.11 **ALTERNATIVES**

.1 Alternatives to manufacturer’s brands or supply sources of materials will not be accepted

1.12 **WARRANTY**

.1 Provide a written five-year material, labour, and workmanship warranty, commencing from the date of Substantial Performance, covering the replacement and making good of defects in materials and workmanship. Defects to include, but not restricted to, leakage, cracking, deterioration, shrinkage, adhesive and cohesive failure, staining or failure to provide intended seal.

2 Products

2.1 **MATERIALS – GENERAL**

.1 Sealant: Non-Bleeding and capable of supporting their own weight.

.2 Sealants, cleaning solvents and primers: Compatible with each other, as recommended by sealant manufacturer.

.3 Sealant Colours: To later selection by consultant. Allow for standard colours as selected by the consultant.

2.2 **SEALANTS**

.1 Exterior: One component, neutral-cure, medium-modulus, elastomeric silicone sealant or polyurethane; pre-pigmented. To ASTM C920.

n. Product: Dowsil CWS Building Sealant, or approved alternative.

o. Colour: Allow for standard colour.

.1 Colour to match masonry colour. The colour of the sealant shall be approved by the consultant from the manufacturer's range of standard colours.

2.3 **ACCESSORIES**

.1 Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

.2 Masking tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

.3 Cleaning material: as recommended by sealant manufacturer.

3 Execution

3.1 **EXAMINATION**

.1 Examine joints to be sealed and report in writing to the Consultant any defects in Work of other Sections which would impair installation, performance and warranty of sealants.

.2 Commencing with the installation means acceptance of the existing substrates by the Contractor.

.3 Examine the areas and conditions under which the work will be performed. Review the plannedoperating procedures with the Consultant. Do not proceed with work until any unsatisfactoryconditions are corrected in a manner acceptable to both the Owner and the Consultant.

.4 Verify that the specified environmental conditions exist before commencing with the work.

.5 The Contractor shall arrange for the sealant Manufacturer's representative to visit the site and review the surface preparation and installation procedures at the start of the work.

3.2 **PROTECTION**

.1 The Contractor is responsible for maintaining the work weather tight during the course of theproject. At the end of each work day or when stoppage occurs, provide necessary protection toprevent water penetration through the exterior walls.

.2 Seal and protect all openings, doors, windows and adjacent areas to minimize the potential for damage and the spread of dust, water or other materials into the building or adjacent sidewalksand properties.

.3 Protect adjacent finished materials from marking or damage during the work.

.4 Protect completed sealant installation during and after curing period from contact with contaminating substances and from damage resulting from construction operations or othercauses such that sealant is without deterioration or damage at time of substantial completion.If, despite such protection, damage or deterioration occurs, such sealant shall be rectified immediately.

3.3 **PREPARATION**

.1 Prepare joints in accordance with ASTM C1193 and manufacturer's instructions.

.2 Clean and prepare surfaces to be sealed to provide clean sound surfaces for sealant adhesion in accordance with sealant manufacturer's recommendations.

.3 Remove dust, oil, grease, water, frost, loose mortar and other foreign matter. Remove loose particles by blowing joint out with compressed air.

.4 Prevent staining of adjacent surfaces by masking with tape prior to sealing.

.5 Examine joint sizes and correct to achieve depth to width proportions schedule herein, with width and depth of 6 mm.

3.4 **APPLICATION**

.1 Install sealants in accordance with ASTM C1193 and manufacturer's instructions, using suitable equipment.

a. Install sealants immediately after joint preparation.

b. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

.2 Force sealant into joints in full bead, making certain that full contact is made with sides of joint. Tool joints to produce a slightly concave surface.

.3 Provide concaved recessed finish to installed sealant, free of ridges, wrinkles and embedded foreign matter. Sealant shall not spread or bulge beyond surfaces on each side of joint.

.4 Apply sealants in accordance with the manufacturer’s depth to width ratios.

.5 The sealant must be applied continuously to ensure that all voids and joints are completely filled.

.6 Tool the sealant with light pressure immediately after application to ensure positive and complete contact of the sealant to the interface. Only tooling agents that are approved in writing by the sealant manufacturer and that do not discolour sealants or adjacent surfaces shall beused.

.7 Neatly tool the surface to form a slight concave profile. The surface of the sealant shall be smooth, free from ridges, wrinkles, air pockets and embedded impurities.

3.5 **PROTECTION**

.1 Protect all sealant against puncture or damage until sealant has cured attained its final set.

.2 Provide temporary covers over joints where joints have been cleaned out, but not yet sealed.

3.6 **CLEANING**

.1 Remove masking tape in a suitable time to not leave remnants on the protected material.

.2 Clean adjacent surfaces immediately and leave Work neat and clean. Remove excess sealant and droppings, using recommended cleaners as Work progresses. Remove masking tape after tooling of joints. Make good any damage caused.

3.7 **SCHEDULE**

.1 General: Use only sealants which are proven to be compatible with materials they are in contact with. Notify Consultant prior to start of Work should any sealant specified be considered unsuitable for the purpose intended.

.2 Wherever possible sealant application to occur after all other finish work is complete.

END OF SECTION

1. General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.2 **PRE-START HEALTH AND SAFETY REVIEW**

.1 Provide a Pre-Start Health and Safety Review in accordance with the Occupational Health and Safety Act (Ontario), Regulation 851, as amended.

1.3 **SCOPE OF WORK**

.1 Supply and install a new operable painted wood sash one-over-one interior storm windows including all related hardware as identified on the contract documents.

.2 Restoration of the original painted wood hung windows as identified on drawings.

.3 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately but will be considered incidental to work of this section.

.4 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

.5 All work to be completed in accordance with the Health and Safety Guideline for Silica on Construction Projects by Occupational Health and Safety Branch of the Ministry of Labour.

1.4 **REFERENCE STANDARDS**

.1 ASTM International

.1 ASTM E 779-[10], Standard Test Method for Determining Air Leakage Rate by Fan Pressurization.

.2 ASTM E 1186 - [03(2009)], Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Barrier Systems.

.3 ASTM E 1827-[11], Standard Test Methods for Determining Air tightness of Buildings Using an Orifice Blower Door.

.4 ASTM E 2178 -[13], Standard Test Method for Air Permeance of Building Materials.

.2 Canada Green Building Council (CaGBC)

.1 LEED Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations (including Addendum [2007]).

.3 CSA Group (CSA)

.1 CAN/CSA-A440 -[00 (R2005)] Windows.

.2 CAN/CSA-A440.2-[14] /A440.3-[14], Energy Performance of Windows and Other Fenestration Systems / User Guide to CSA A440.2-[04], Energy Performance of Windows and Other Fenestration Systems

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

.1 Safety Data Sheets (SDS).

1.5 **SEQUENCING**

.1 Sequence work of this Section with work of Section 07 92 00 and 09 91 00.

.1 Sequence work to suit scope of work specified:

.2 Protect adjacent masonry and finishes around the window as required.

.3 Confirm on site measurements.

.4 Fabricate storm window.

.5 Install new interior storm window.

1.6 **SUBMITTALS**

.1 Samples: glazing, and hardware.

.2 Shop drawing for interior storm window, including all fastenings and hardware.

.3 Test and Evaluation Reports.

.1 Provide one copy of air leakage test evaluation reports.

.4 Submit the information directly to the Consultant.

.5 Do not fabricate Work of this Section until shop drawings have been reviewed, and related submittals and samples as required by the specifications have been reviewed by the Consultant.

1.7 **CLOSEOUT SUBMITTALS**

.1 Record Documentation.

.1 Provide one copy of photographic documentation before, during and after the storm window installation.

.2 Provide one copy of As-built drawings.

1.8 **MOCK-UPS**

.1 Construct mock-ups in accordance with Section 01 45 01 - Quality Control.

.1 Construct a corner section mock-up of the typical interior storm window.

.2 Provide minimum 2 working days' notice to Consultant prior to beginning mock-up.

.3 Provide 48 hours' notice for inspection of mock-up by Consultant.

.4 Obtain Consultant's written approval of mock-up before proceeding with the Work.

.5 When accepted, the approved mock-up will serve as the quality standard for this work.

.6 Approved mock-up may remain as part of finished work.

1.9 **QUALIFICATIONS**

.1 The fabrication and installation of new interior storm windows shall be completed by a company specializing in historic wood window work with a minimum of ten (10) years proven experience for projects of similar size and complexity.

1.10 **DELIVERY, STORAGE AND PROTECTION**

.1 Storage and handling of dismantled components:

.1 Protect from weather.

.2 Ensure easy accessibility.

.3 Store together in logical groupings.

.4 Pad, support and stack sashes and frames. Prevent damage to components.

.5 Maintain component labels in good condition and securely attached to components until re-installation.

.2 Packaging Waste Management.

.1 Separate and recycle/reuse pallets, crates, padding and packaging materials of products and systems in accordance with Section 01 74 03 - Waste Management and Disposal and the Waste Reduction Workplan, and the Waste Management Plan to the maximum extent economically possible.

.2 Separate corrugated cardboard in accordance with the Waste Disposal Plan and place in designated areas for recycling.

.3 Do not burn waste at project site.

.4 Fold up metal banding, flatten, and place in designated area for recycling.

1.11 **WARRANTY**

.1 The Contractor shall submit a warranty of the work of this section covering a period of not less than five (5) years from the date of Substantial Performance of the Contract. Substantial completion shall be determined by the Consultant and the Owner.

1.12 **ENVIRONMENTAL REQUIREMENTS**

.1 All work shall be performed in strict accordance with manufacturer's written requirements for all products specified in the specification.

.2 Should a conflict arise between the requirements of this section and the manufacturer's requirements, the more stringent requirements shall govern.

1.13 **DESIGN CRITERIA**

.1 Consultants Drawings:

.1 Details shown on drawings are schematic and show general arrangement and intent.

.2 This section is responsible for:

.1 The design, positioning, sizing and configuration of all anchoring devices, clips, angles and the like.

.2 Providing means of compensating for unevenness and dimensional differences in the Work of others to which Work of this section is secured.

1.14 **HAZARDOUS MATERIAL MANAGEMENT**

.1 Assume paint contains lead. Follow the appropriate abatement procedures as outlined by the Authorities having Jurisdiction.

.2 General: All work that disturbs lead-containing paint (LCP), should be handled, transported and disposed, including residue in compliance with all applicable federal, provincial, and local laws and regulations for identification, removal, labeling, handling, containerization, transportation, and disposal of lead-containing material including, but not limited to, those referenced herein.

2. Products

2.1 **GENERAL**

.1 Coordinate and confirm all new interior storm window dimensions with actual measure of window openings.

.2 All reinforcing and connectors shall be in conformance with CSA A370.

.3 Reinforcing connectors shall be installed in accordance with the manufacturer's instructions.

.4 All reinforcing and connectors shall have a corrosion protection level of II as specified in CSA Standard A370.

.5 Fasteners: Comply with NWWDA requirements for fabrication; and with manufacturer's printed recommendations for type and size of installation fasteners except as follows:

i. Zinc-coated or non-ferrous nails and screws for installation of wood window units.

ii. Nails, Spikes, and Staples: Size and type to suit application; non-ferrous metal or galvanized steel for exterior locations, high humidity locations, and treated wood.

2.2 **PERFORMANCE/DESIGN CRITERIA**

.1 Air infiltration for primary sashes: CAN/CSA-A440.2/A440.3

2.3 **WOOD**

.1 Lumber shall be of sound stock, solid wood without finger joints or other joints within members, thoroughly seasoned, and kiln-dried to a moisture content not exceeding 12 percent for exterior and 8 percent for interior.

.2 Wood shall be free from defects or blemishes on surfaces exposed to view that will show after paints and finishes have been applied. Materials that do not comply with specifications for quality and grade, are in any way defective, or are otherwise not in proper condition will be rejected.

.3 For existing wood restoration the intent is that all existing woodwork will be repaired and replaced, where necessary. If required, new wood shall be used to replace the existing at the direction of the Consultant. All replacement material shall match the existing wood species, grade and cut.

.4 For new wood window frames use kiln-dried, Clear C select, eastern white pine: match existing profile, thickness and dimensions of the existing windows.

2.4 **WOOD FASTENERS**

.1 Screws: Corrosion resistant self-tapping #8 wood screws. Length to suit application – at least 2 times the thickness of wood being secured.

.2 Corrosion resistant #8 countersunk wood screws.

2.5 **ADHESIVES**

.1 Adhesive for Dutchman Repairs: two-part, low-viscosity liquid epoxy, designed for use with wood.

.2 Adhesive for Window manufacturing: exterior grade polyvinyl acetate glue

2.6 **CAME**

.1 Lead came: to match existing profile in all dimensions excepting for the provision of semi-round for added dimensional strength.

.2 Lead came to be Cascade lead products; #2 alloy restoration lead came, 1614 West 75th Ave., Vancouver, BC, V6P 6G2, (604) 261 8884 or approved alternative.

2.7 **SOLDER**

.1 To be 60/40

2.8 **REINFORCEMENT BARS**

.1 New cold rolled steel bars

2.9 **HARDWARE**

.1 Casement hardware.

.1 Latch: To match existing,

.1 Ives No 66 Casement Fastener, supplier Kilian, finish antique brass (to match existing).

.2 Traditional Sash Lock, supplier Kilian, finish antique brass (to match existing).

.2 Adjuster: To match existing,

.1 Rod type casement window adjuster, supplier Kilian, finish antique brass (to match existing).

.2 Premium casement window adjuster with beveled bases, supplier House of Antique Hardware, finish antique brass (to match existing).

.3 Telescoping casement stay, finish antique brass (to match existing).

.3 Or approved alternatives.

2.10 **GLASS**

.1 Existing glass replacement, if required will be completed with glass to match the existing glass being replaced.

2.11 **PUTTY**

.1 Restoration windows: Dap 33 window glazing , or approved alternative.

.2 Interior storm window glazed with putty and wooden glazing stops.

2.12 **ACCESSORIES**

.1 Non-corroding glazing points.

.2 Heavy felt with adhesive back.

.3 For caulking refer to Section 07 09 10 Joint Sealing.

2.13 **CLEANING SOLUTION FOR GLAZING**

.1 Neutral pH, non-ionic cleaning product, such as Orvus WA Paste by Procter and Gamble Professional.

2.14 **FINISH**

.1 Refer to Section 09 91 00 Painting for product specification.

3. Execution

3.1 **PROTECTION**

.1 Protect all adjacent surfaces including masonry and landscaping from any damage resulting from work of this section.

.2 Prevent dust and fumes from entering the building.

3.2 **INSPECTION AND DOCUMENTATION**

.1 Examine the areas and conditions where window restoration is to be executed. Take all necessary field measurements. Notify the Consultant of conditions detrimental to the proper and timely completion of Work. Do not proceed until unsatisfactory conditions are corrected.

.2 Prior to fabrication review locations and installation methods for each window location with the Consultant and Owner to confirm placement, dimensions for units and to identify any unique details for individual windows. Consultant to provide sign-off of review prior to fabrication.

3.3 **PREPARATION**

.1 Photograph window sash, frame elements and hardware.

.2 Install temporary enclosures where required.

.3 Protect window frames for duration of the Work.

.1 Protect from direct sun.

.2 Keep dry.

.3 Protect from vandalism.

.4 Identify, label and photograph window sash and frame elements.

.1 Use same component designation as shown on Contract Drawings.

.1 Provide sufficient additional information: ensure component configuration and orientation is recorded on label.

.2 Record component label information on Contract Drawings.

.3 Labels: gasket paper marked with waterproof marker. Securely attach to component.

.4 Glazing components: ensure required component information is marked on gasket paper with waterproof marker. Securely attach to component.

.5 Discuss with Consultant intended approach for removal of window sash, and hardware.

.1 Provide written methodology for approval by the Consultant.

.2 Obtain Consultant's written approval of approach for removal of window frame and hardware.

.6 Notify Consultant before removing window sashes.

.1 Remove sashes from frame, label components, carefully pack in crates and transport to shop for repairs.

3.4 **WINDOW REMOVAL**

.1 Prior to removal Contractor to provide a written plan for the method of removal, transport and storage of the windows.

.2 Windows are **not** to be removed until all documentation is complete. Documentation includes photographs, and rubbings.

.3 Windows to be removed with extreme care not to damage glass or associated materials and finishes.

.4 Loose fragments are to be held with low tack masking tape (blue or green). Compromised leading structure to be held with regular tack masking tape. All tape to be removed upon delivery to studio.

.5 Provide safe transport in protective crates or covered stained glass rack.

.6 Temporary boarding of openings to be coordinated with General Contractor.

3.5 WINDOW OPENING PROTECTION

.1 After windows are removed install tightly fit exterior grade 15.8mm (5/8") plywood with rigid foam in window opening.

.2 Friction fit. No fastening into exterior or interior finishes is permitted.

.3 If seams are required in the plywood assembly ensure seams are weather tight by sealing with removable caulking (DAP Draft Attack or approved alternative).

.4 Seal around plywood perimeter with the same removable caulking identified in item 3.4.3.

3.6 SHOP FABRICATION / REPAIR

.1 Fabricate window components in accordance with approved shop drawings.

.2 Surface preparation of sashes. Remove paint products.

.1 Conduct surface preparation in the shop.

.3 Make repairs of window units plumb, level, square and true.

.4 Existing Glazing Removal

.1 Remove existing glazing lights from sashes.

.2 Remove existing glazing putty, paint and corrosion products from sash.

.3 Remove remnants of glazing putty with scrapers, chisels and razor blades as required.

.4 Clean with specified product and absorbent cloths.

.5 Replace broken glazing lites with new to match existing.

.6 Replace glazing broken during removal procedures at own expense.

.5 Splicing in new material.

.1 Cut out deteriorated wood sections as identified from the assessment with the Consultant.

.2 Splice in new wood sections to match profile of existing wood section.

.3 Shop fit parts before connecting and gluing.

.4 Corners of sashes.

.1 Mitre corners.

.2 Connect and dress corners.

.3 Stile, and rail joints: glue and plane smooth.

.6 Surface Voids.

.1 Fill surface voids with compounds formulated for wood.

.2 Repair damaged area with two-pack resin and hardener.

.7 New glazing installation.

.1 Sand and clean rebates.

.2 Apply back putty to rebate.

.3 Bed glass firmly into position in rebate. Ensure it is evenly seated.

.4 Install glazing points.

.5 Neatly apply exterior putty bevel in line with edges of stiles and rails.

.6 Strike off excess putty.

.7 Allow putty to cure for minimum 3 weeks before shipping and painting. According to manufacturer's specifications.

.8 Prepare windows for transportation to site.

.1 Prepare sashes with glazing stops temporarily installed.

.2 Pack repaired windows in crates and padding.

.3 Transport to site.

3.7 **IN-SITU RE-FINISHING**

.1 Paint Removal

.1 Remove existing paint with tools in the following order:

.1 Wire brush

.2 Wire wool

.3 Wet and dry

.2 Undertake minor repairs including:

.1 Fill of the surface voids.

.1 Fill surface voids with compounds formulated for wood.

.2 Apply patching compound. Build up surfaces [where indicated on Contract Drawings].

.3 Slope built-up surfaces away from glazing.

.3 Re-painting and refinishing in accordance with Section 09 91 00 Painting

.4 Keep moving parts and flexible components free from primer and paint.

.1 Prime and seal glazing putties.

.2 Apply one primer base coat to sashes and frame.

.3 Apply two topcoats to sashes and frame.

3.8 **DISMANTLING EXISTING WINDOW SASHES**

.1 General.

.1 Remove paint using scraping and stripping techniques.

.2 Avoid damaging materials and finishes adjacent to the windows being dismantled.

.3 Avoid damaging material and window components.

.4 Avoid marring, crushing or splitting components.

.5 Minimize risk of breakage: reinforce panes of glass with vinyl adhesive tape on both sides.

.6 Remove interior sash.

.7 Retain dismantled components for duration of the Work.

.8 Cover window openings with plywood sheathing while the sash is out for repair.

.2 Storage and handling of dismantled components.

.1 Protect from weather.

.2 Ensure easy accessibility.

.3 Store together in logical groups.

.4 Pad, support and stack sashes. Prevent damage to sashes.

.3 Removal of hardware and screws.

.1 Clean screw heads.

.2 Apply penetrating oil to screw heads 24 hours in advance of removal.

.3 Use only screwdrivers that exactly fit screw heads.

.4 Retain and store for restoration removed hardware and screws.

3.9 **EPOXY REPAIR**

.1 Repair minor holes checks and small pockets of decay using epoxy in accordance with manufacturer's directions.

3.10 **SURFACE VOIDS**

.1 Fill surface voids with filler.

.2 Build up surfaces by applying patching compound.

.3 Repair damaged area with two-pack resin and hardener.

3.11 **SPLICING IN NEW MATERIAL**

.1 Material.

.1 Same wood species as existing parent wood component.

.2 Grain orientation to match existing parent wood component.

.2 Cut out damaged or deteriorated wood sections.

.3 Splice in new wood sections to match profile of existing wood section.

.4 Fit parts before connecting and gluing.

.5 Stile, rail and muntin joints: glue, plane and sand smooth.

3.12 **DUTCHMAN REPAIRS**

.1 Restore original profile and ensure proper fit of wood components:

.1 Repair damage in sashes and frames with Dutchman repairs.

.2 Employ Dutchman repairs only where wood is broken or missing.

.3 Areas with minor wear of wood are acceptable for re-use.

.2 Material.

.1 Same wood species as existing parent wood component.

.2 Grain orientation to match existing parent wood component.

.3 Joints.

.1 Ensure joints are tight and visible only on close inspection.

.2 Exterior exposed joints: weather tight, beveled for moisture drainage to exterior.

.4 Application.

.1 Prepare damaged area of existing parent wood component for Dutchman repair.

.2 Cut out damaged and deteriorated wood sections.

.3 Splice Dutchman repair piece into parent wood component.

.4 Fit parts before connecting and gluing.

.5 Attach Dutchman repair piece to parent wood component only. Do not attach to adjacent wood component.

.6 Clamp repair piece in place until adhesive has set. Protect repair piece and other wood components from pressure marks.

.7 Avoid using surface fasteners.

.8 Larger Dutchman repairs:

.1 Fasten repair piece to parent wood component with stainless steel screws, size to suit.

.2 Countersink screw and fill hole with wood plug.

.3 Match grain orientation of wood plug to parent wood component.

.9 Stile, rail and muntin joints glue, plane and sand smooth.

3.13 **GLAZING RE-PUTTYING**

.1 Existing Glazing.

.1 Remove existing glazing putty, paint and corrosion products from sash and frame.

.2 Remove remnants of glazing putty with scrapers, chisels and razor blades.

.3 Clean with acetone and absorbent cloths.

.4 Replace broken glazing lights with new 3 mm thick glass to match existing.

.5 Replace glazing broken during removal procedures at own expense.

.2 New glazing installation.

.1 Sand and clean rebates.

.2 Apply back putty to rebate.

.3 Bed glass firmly into position in rebate. Ensure it is evenly seated.

.4 Install glazing points.

.5 Neatly apply exterior putty bevel in line with edges of stiles and rails.

.6 Strike off excess putty.

.7 Allow putty to cure for minimum 3 weeks before shipping and painting. According to manufacturer's specifications.

3.14 **REPAIR OF CAME**

.1 Carefully repair came where bent of damaged by removing glazing prior to reshaping.

.2 Care should be taken when reforming. If the reforming will lead to damage stop work and consult with the consultant to determine if work is to be completed.

3.15 **RE-PAINTING AND FINISHING**

.1 Perform re-painting and finishing of wood windows in accordance with Section 09 91 00 Painting.

3.16 **RE-INSTALLATION OF SASHES**

.1 Set units plumb, level and true to line.

.2 Ensure that sashes are operable.

.3 Install new interior storm sashes with new hardware.

.4 Apply final paint top coat to sash.

.5 After painting and finishing, install and adjust restored hardware.

.6 Adjust sashes to operate smoothly in frames.

3.17 **NEW STORM WINDOWS**

.1 Confirm interior storm window glazing sizing and locations on site.

.2 Fabricate woodwork to dimensions, profiles, and details indicated.

.3 Before fabrication of woodwork to be fitted to other construction, obtain field measurements and verify dimensions and shop drawings detail as required for accurate fit.

.4 Install woodwork plumb and level without distortion.

.5 Shim as necessary with concealed shims.

3.18 **TRANSPORTATION OF RESTORED SASHES AND NEW STORM WINDOWS FROM SHOP TO SITE**

.1 Prior to packaging and transporting the restored and new windows back to site Consultant to perform shop review of finished product.

.2 Sash and new storm windows to be transported to site with extreme care to ensure no damage is incurred to the finish product. Transport in protective crates.

3.19 **WOOD ELEMENT TOLERANCES**

.1 Tolerance on any face dimension is + or – 1 mm.

.2 Tolerance on thickness is + or – 1 mm.

.3 Maximum variation from true plane on flat surface is 0.8 mm.

.4 Maximum variation on edge straightness is 0.8 mm.

3.20 **HARDWARE INSTALLATION**

.1 Remove broken hardware.

.2 Ensure windows have finished paint application prior to hardware installation.

.3 Hardware to match adjacent hardware in same window or hardware that is being replaced.

.4 To be installed level in same location as original hardware.

.5 Confirm operation of hardware prior to consultant review.

3.21 **PROTECTION**

.1 Until time of substantial completion protect all restored and new windows from damage or deterioration.

3.22 **CLEANING**

.1 When directed, or just before the Project is turned over to the Owner, remove dirt and other foreign material from finished surfaces and both sides of glass. Wash and polish glass on both sides.

.2 Restore major visual damage to finish in a manner to match the appearance and performance of the original finish.

END OF SECTION

1 General

1.1 **GENERAL REQUIREMENTS**

.1 Comply with requirements of Division 1.

1.2 **PRE-START HEALTH AND SAFETY REVIEW**

.1 Provide a Pre-Start Health and Safety Review in accordance with the Occupational Health and Safety Act (Ontario), Regulation 851, as amended.

1.1 **WORK INCLUDED**

.1 Paint removal, preparation, and repainting of wood and metal windows where specified.

.2 Paint removal, preparation, and repainting of metal doors.

.3 Paint removal, preparation and repainting of woodwork related to the roof replacement.

.4 All work necessary for completion of work of this section, including but not limited to setting up of scaffolding, permits, authorization from utilities, protection of adjacent roof areas, etc. The cost associated with these items will not be paid for separately but will be considered incidental to work of this section.

.5 This section shall include all accessories necessary to complete the work, tie-ins to adjacent systems, and modifications to existing flashings and finishes to accommodate the masonry repairs.

.6 Where conflict exists in the scope of work, requirements, standards, or codes, the most stringent criteria shall apply.

.7 All work to be completed in accordance with the Health and Safety Guideline for Silica on Construction Projects by Occupational Health and Safety Branch of the Ministry of Labour.

1.3 **REFERENCES**

.1 Master Painters Institute (MPI)

i. Maintenance Repainting Manual [current edition], Master Painters Institute (MPI) including Identifiers, Evaluation, Systems, Preparation and Approved Products List.

.2 Environmental Protection Agency (EPA)

i. Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, Method 24 (for Surface Coatings).

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

i. Safety Data Sheets (SDS).

1.4 **QUALITY ASSURANCE**

.1 Applicator experience: Having minimum of five years proven satisfactory experience in heritage painting work. When requested, provide a list of the last three comparable projects including, name and location, start and completion dates, and value of the painting Work.

.2 Applicator qualification: Qualified journeypersons, painters, as defined by local jurisdiction shall be engaged in painting and decorating Work and with experience working on heritage projects. Apprentices may be employed provided they Work under the direct supervision of a qualified journeyperson in accordance with trade regulations.

.3 Materials, preparation, and quality of Work: In conformance with requirements of the latest edition of the Architectural Painting Specification Manual by the Master Painters Institute, referred to as the MPI Painting Manual in this Section, issued by the local MPI Accredited Quality Assurance Association having jurisdiction.

.4 Manufacturers and Products: Listed under the Approved Product List section of the MPI Painting Manual.

1.5 **MOCK-UP**

.1 Construct mock-up in accordance with section 01 45 00 – Quality Control.

.2 Construct a typical mock-up one (1) week prior to commencing with the work at a location agreed with the Consultant to demonstrate preparation, and paint application.

.3 Mock-ups:

.1 3 paint removal mock-ups/substrate to determine best method for removal - wood and metal windows and roof woodwork.

.2 Surface preparation on all surfaces

.3 Primer application on all surfaces

.4 Topcoat application on all surfaces

.4 Upon receipt of written confirmation from the Consultant, the mock-up may remain as part of the finished work.

.5 The Contractor must receive written confirmation of the mock-up acceptance prior to commencing with the work.

.6 Approved mock-up shall serve as the standard to which all related work shall be evaluated.

.7 Rejected mock-ups will be removed and disposed of at the expense of the Contractor.

1.6 **SUBMITTALS**

.1 Submittals shall meet requirements of Section Submittals 01 33 00.

.2 Submittals to be provided prior to work commencing.

.3 List of painting materials: submit a list of painting materials for review prior to ordering materials. If requested, provide an invoice list of all paint materials ordered for project Work to Consultant indicating manufacturer, types and quantities for verification and compliance with specification and design requirements.

.4 Material Safety Data Sheets (MSDS): Submit duplicate copies prior to commencement of Work for review and for posting at Place of the Project as required.

.5 Project Data Manual: At project completion provide an itemized list complete with manufacturers' application instructions, paint type and color coding for all colors used for Owner's later use in maintenance.

1.7 **SAMPLES**

.1 Samples: Provide duplicate minimum 300 mm square samples on same substrate as finished product of specified paint or coating in colors, gloss, sheen, and textures required to MPI Painting Manual standards for review. When approved, samples become acceptable standard of quality.

.2 Sample installations: When requested by the Consultant, prepare and paint designated surface, area, room, or item in each color scheme to requirements specified, with specified paint or coating showing selected colors, gloss, sheen, textures and quality of Work to MPI Painting Manual standards for review and approval. When approved, surface, area, room, and items become acceptable standard of finish quality and workmanship.

1.8 **PRODUCT DELIVERY, STORAGE AND HANDLING**

.1 Deliver all painting materials in sealed, original labelled containers bearing manufacturer's name, brand name, type of paint or coating and color designation, standard compliance, materials content as well as mixing and/or reducing and application requirements.

.2 Store all paint materials in original labelled containers in a lockable, dry, heated and well ventilated single designated area meeting the minimum requirements of both paint manufacturer and authorities having jurisdiction and at a minimum ambient temperature of 7 degree C. Only store material used for this project at Place of the Project.

.3 Where toxic, volatile, explosive, flammable materials are being used, provide adequate fireproof storage lockers and take all necessary precautions and post adequate warnings such as no smoking signs as required.

.4 Take necessary precautionary and safety measures to prevent fire hazards and spontaneous combustion and to protect the environment from hazard spills. Store materials that constitute a fire hazard in suitable closed and rated containers and removed from the Place of the Project daily.

.5 Comply with requirements of authorities having jurisdiction, regarding the use, handling, storage and disposal of hazardous materials.

1.9 **PROJECT CONDITIONS**

.1 Unless specifically accepted by the Consultant and the Product manufacturer, do not perform Work when the ambient air and substrate temperatures are below 10 degree C for both interior and exterior Work.

.2 Do not perform interior Work unless adequate continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above minimum requirements for 24 hours before, during and 48 hours after Work is complete, unless required otherwise by manufacturer's instructions. Provide supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.3 Do not perform Work when the relative humidity is above 85% or when the substrate temperature is less than 3 degree C above the measured dew point.

.4 Apply Work only to dry, clean, properly cured and adequately prepared surfaces in areas where dust is no longer generated by construction activities such that airborne particles will not affect the quality of finished surfaces.

.5 Unless specifically accepted by the Consultant and the Product manufacturer, do not perform Work when Substrate is wet, damp or frosted.

.6 Unless specifically accepted by the Consultant and the Product manufacturer, do not perform Work when Precipitation is forecast to occur before paint has thoroughly cured.

.7 Unless specifically accepted by the Consultant and the Product manufacturer, do not perform Work when It is foggy, misty, raining, icing or snowing at site.

.8 Do not perform Work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted or decorated.

.9 Conduct all moisture tests using a properly calibrated electronic Moisture Meter.

1.10 **CLOSEOUT SUBMITTALS**

.1 Submit in accordance with Section 01 78 00 – Close out Submittals.

.2 Operation and Maintenance Data: submit operation and maintenance data for paints and coatings for incorporation into manual.

i. Provide records of products used. List products in relation to finish system and include following:

i. Product name, type and use (e.g. materials and location).

ii. Manufacturer's product number.

iii. Colour code numbers.

iv. Manufacturer's Safety Data Sheets.

.3 Submit maintenance record of painting work.

1.11 **EXTRA STOCK**

.1 At Substantial Performance provide extra stock of each type and color of paint from same production run used in unopened cans, properly labelled and identified for Owner's later use in maintenance. Include cost of extra stock in Contract Price.

i. 1 L of extra stock when less than 50 L was used for the Work of this Contract.

ii. 3.78 L of extra stock when 50 L to 200 L was used for the Work of this Contract.

iii. 7.57 L of extra stock when over 200 L was used for the Work of this Contract.

1.12 **WASTE MANAGEMENT AND DISPOSAL**

.1 Assume paint is lead containing.

.2 Paint, stain and wood preservative finishes and related materials such as thinners, solvents are regarded as hazardous Products and are subject to regulations for disposal. Obtain information on these controls from applicable authorities having jurisdiction.

.3 Separate and recycle waste materials. Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility. Materials that cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner.

.4 Place materials defined as hazardous or toxic waste, including used sealant and adhesive tubes and containers, in containers or areas designated for hazardous waste.

.5 Strictly adhere to the following procedures to reduce the amount of contaminants entering waterways, sanitary and storm drain systems or into the ground:

i. Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.

ii. Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.

iii. Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.

iv. Dispose of contaminants in an approved legal manner in accordance with hazardous waste regulations.

v. Empty paint cans are to be dry prior to disposal or recycling (where available).

vi. Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

.6 Set aside and protect surplus and uncontaminated finish materials not required by the Owner and deliver or arrange collection for verifiable reuse or remanufacturing.

1.13 **SCHEDULING**

.1 Schedule painting operations to prevent disruption of and by other Sections.

.2 Schedule painting operations in occupied facilities to prevent disruption of occupants in and about the building. Schedule Work such that painted surfaces will have dried before occupants are affected. Obtain written authorization from Owner for changes in Work schedule.

1.14 **WARRANTY**

.1 Provide a written two-year material, labour and workmanship warranty, commencing from date of Substantial Performance, covering the replacement or making good of defects in materials and workmanship. Promptly correct any defects or deficiencies that become apparent within warranty period, acceptable to Owner and at no expense to Owner. Defects include but are not limited to; material shrinkage, cracking, splitting and defective workmanship including but are not limited to failure in bubbling, blistering and delamination.

2 Products

2.1 **MATERIALS**

.1 Only materials listed in the latest edition of the MPI Approved Product List (APL) are acceptable for use for the Work of the Project. Provide material from a single manufacturer for each system used.

.2 Other materials not listed in the APL shall be the highest quality Product of an MPI listed manufacturer and shall be compatible with paint materials being used as required.

.3 All materials used shall be lead and mercury free and comply with Volatile Organic Compound (VOC) Concentration Limits for Architectural Coatings Regulation pursuant to the Canadian Environmental Protection Act.

.4 Provide materials having good flowing and brushing properties and capable to dry or cure free of blemishes, sags, air entrapment.

.5 Apply materials in accordance with manufacturer's printed specifications.

2.2 **PAINT REMOVERS**

.1 Proprietary waterless paint removal system suitable for removing multiple paint layers from decorative wood elements.

i. Acceptable System for Wood Elements: Peel-Away Smart Strip, by Dumond Chemicals Inc.

2.3 **PAINT**

.1 Colour: Standard colour as directed by the Consultant.

.2 Metal

i. Primer:

a. Acrylic Metal Primer V110, Benjamin Moore, Colour: White

b. Kem Bond High Solid Alkyd Universal Primer, Sherwin Williams, Colour: Off White

ii. Finish Coat:

a. Acrylic DTM Enamel, Semi-gloss V331, Benjamin Moore. Final colour to be confirmed after mock-ups.

b. Emerald Exterior Acrylic Latex Paint, Sherwin Williams. Final colour to be confirmed after mock-ups.

iii. Or approved alternatives.

.3 Wood

i. Primer:

a. Fine Paints of Europe, ECO Primer/Undercoat, Colour: White

b. Aqua Lock Plus, Benjamin Moore, Colour: White

c. Rejuvenate, Low Sheen, Sherwin Williams, Colour: Extra White

ii. Finish Coat:

a. Fine Paints of Europe, ECO Satin.

b. Regal Select Exterior Paint, High build Soft Gloss Finish N403, Benjamin Moore, Colour: Standard colour. Final colour to be confirmed after mock-ups.

c. Rejuvenate, Low Sheen, Sherwin Williams, Colour: Standard colour. Final colour to be confirmed after mock-ups.

iii. Or approved alternatives.

2.4 **ACCESSORIES**

.1 Wood or plastic scrapers.

.2 Felt pads

.3 Soft natural-bristle brushes

.4 Clean, soft lint free cloths

.5 Vacuum with HEPA filter

.6 Obtain approval of Consultant for use of power tools.

.7 Use tools that do not damage adjacent materials.

3 Execution

3.1 **CONDITION OF SURFACES**

.1 Prior to commencement of Work thoroughly examine and test as required conditions and surfaces scheduled to be painted. Do not commence Work until adverse conditions and defects have been corrected.

3.2 **PREPARATION**

.1 Ensure workers are kept safe in accordance with Reviewed Safety Plan and Federal, Provincial, Municipal regulations.

.2 Implement safety measures as required in preparation for implementing work.

.3 Place safety devices and signage in locations as required by Reviewed Safety Plan and in accordance with Federal, Provincial, Municipal regulations.

3.3 **PROTECTION**

.1 Protect all adjacent surfaces including masonry, concrete pavements, glass, and landscaping from paint splatter, or any damage resulting from work of this section.

.2 Prevent dust and fumes from entering the building.

.3 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas.

3.4 **PAINT REMOVAL**

.1 Assume paint is lead containing. Follow the appropriate abatement procedures as outlined by the Authorities having Jurisdiction.

.2 General:

i. Comply with all Federal, Provincial, and local VOC regulations.

ii. Where any manufacturer listed makes more than one grade of each material specified, use the highest grade of each type whether or not the material is mentioned by trade name in these specifications.

iii. Follow manufacturer's instructions regarding preparation of surfaces, mixing, applying, drying, etc. In case of conflict with this specification, the manufacturer's specifications govern.

.3 Apply paint remover in accordance with manufacturer's directions. Use application methods best suited for the type of material being applied: gel, paste or liquid.

.4 Apply gel, paste, semi-paste or liquid to dry surfaces 1/8” to 1/4” thick, using a corrosion resistant, plastic trowels or non-metallic brushes. Work paint remover well into crevices. Ensure that the paint remover is applied in an even coat.

.5 Allow remover to remain on the surface for time specified by manufacturer or until all paint is dissolved; whichever is the least amount of time. Do not leave surfaces until it dries. If surfaces are left unattended, prevent pedestrians from contact with the remover.

.6 If remover dries on the surface, mist the surface with water and allow chemical to remain on the surface another 15 minutes until softened. If leaving on the surface for several hours, a light polyethylene film or other moisture resistant material can be used to cover the remover on the surfaces. Press the polyethylene film against the remover so that it adheres. Tape or seal the edges of the polyethylene film.

.7 Carefully remove the chemical remover and dissolved paint coatings by lifting, making sure the substrate is not scraped or gouged. A plastic scraper must be used. Corrosion resistant tools can only be used for this removal. No metal is to be used. Remove as much residue from surfaces as possible.

.8 If small amounts of residue or paint remain, reapply chemical following the manufacturer’s instructions.

.9 Multiple applications of the paint remover may be required to remove all of the paint coatings.

.10 Allow treated surfaces to thoroughly dry. Before applying any new surface coating, check cleaned surfaces again with pH strips that have a range from 1-14. to ensure that surfaces are neutral.

.11 Consultant must certify that the surfaces treated as the work of this section have been adequately cleaned and neutralized, prior to final acceptance of this work.

3.5 **SURFACE PREPARATION**

.1 General

i. Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Requirements except where specified otherwise.

ii. Clean and prepare exterior surfaces in accordance as follows:

i. Remove dust, dirt, and surface debris by brushing, wiping with dry, clean cloths.

ii. Wash surfaces with ion neutral biodegradable detergent and clean warm water using a stiff bristle brush. Remove dirt, oil and surface contaminants. Ensure existing substrate is not damaged by process.

iii. Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

iv. Allow surfaces to drain completely and dry thoroughly.

v. Use water-based cleaners for surfaces to be repainted using water-based paints.

.2 New Wood

i. Ensure new wood is dry and ready for paint application.

ii. Perform work in accordance with manufacturers written recommendations.

iii. Sand bare wood to remove all loose fibres.

iv. Remove all sawdust and dirt oils grease etc as required by paint manufacturer to ensure new paint achieve tenacious bond.

.3 Existing Wood

i. Fill all imperfections greater than 2mm deep/ 3mm long/ 3mm wide with appropriate epoxy filler resins.

ii. Perform work in accordance with manufacturers written recommendations.

iii. Replace decayed wood where specified. If decayed wood is found notify the consultant for review and determination for replacement.

iv. Sand bare wood to remove all loose fibres.

v. Sand all existing paint that remains on the frames and ensure smooth featheredge transition to any existing paint that remains on the wood frames/sashes.

vi. Remove all sawdust and dirt oils grease etc as required by paint manufacturer to ensure new paint achieve tenacious bond.

.4 Metal

i. Remove rust, dirt, oil, grease and foreign substances in accordance with MPI requirements.

ii. Remove contaminates from surfaces, pockets and corners: brush with clean brushes as required.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, corrosive chemicals, grease, oil and solvents before priming.

.6 Touch-up, spot prime, and apply primer, paint, or pre-treatment immediately after cleaning.

.7 Obtain written approval of prepared surfaces by consultant before applying paint.

3.6 **PAINT APPLICATION**

.1 Do not perform Work unless substrates are acceptable and until heating, ventilation, lighting and completion of Work of other Sections are acceptable for applications of Products.

.2 Apply materials in accordance with MPI Painting Manual Premium Grade finish and manufacturers' requirements.

.3 All surfaces to receive 1 coat of primer and 2 full topcoats. Apply coating materials in accordance with manufacturer's written recommendations. Touch up damaged coatings before applying subsequent coats.

.4 Sand between primer and topcoat with 220 grit for proper adhesion. And sand between topcoats with 220-320 grit for proper adhesion. (Refer to manufacturer's specifications for further direction.)

.5 Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying. Provide each coat in specified condition to receive the next coat.

.6 Each coat shall cover the surface of the preceding coat or surface completely.

.7 Apply paint at the film thicknesses recommended by the manufacturer.

.8 Apply topcoat to primer within a period of 48 hours from the time of application of the primer.

.9 Brush and Roller Application:

i. Apply paint in a uniform layer using brush and/or roller suitable for application.

ii. Work paint into cracks, crevices and corners.

iii. Brush and roll out runs and sags, and overlap marks.

iv. Eliminate roller tracking and stipple by finishing with a brush. Maintain historic appearance.

v. Remove runs and sags from finished work and repaint.

vi. Apply final coat of paint with brush.

.10 If Contractor proposes to spray apply, spray application to be approved by the Consultant and confirmed possible by the paint manufacturer. (Note all detail in the architectural elements are to be maintained during painting.)

3.7 **FIELD QUALITY CONTROL AND STANDARD OF ACCEPTANCE**

.1 Painted surfaces will be considered unacceptable if any of the following are evident final lighting source (including daylight):

i. Visible defects are evident on vertical and horizontal surfaces when viewed at normal viewing angles from a distance of not less than 1500 mm.

ii. When the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.

.2 Make good painted surfaces rejected by the inspector to approval of Owner and at no extra cost to the Owner. Touch up small affected areas. Repaint large affected areas or areas without sufficient material dry film thickness. Remove runs, sags of damaged paint by scraper or by sanding prior to application of paint.

3.8 **CLEAN-UP**

.1 Remove paint where spilled, splashed, splattered or sprayed as Work progresses using means and materials that are not detrimental to affected surfaces.

.2 Keep Work area free from an unnecessary accumulation of tools, equipment, surplus materials and debris.

.3 Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.

.4 Clean equipment and dispose of wash water / solvents as well as all other cleaning and protective materials (e.g. rags, drop cloths, masking papers, etc.), paints, thinners, paint removers / strippers in accordance with the safety requirements of authorities having jurisdiction.

3.9 **PROTECTION**

.1 Protect freshly completed surfaces from paint droppings and dust. Avoid scuffing newly applied paint.

.2 Protect completed work from paint droppings. Use non-staining coverings.

.3 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by Consultant.

.4 Remove protective coverings and warning signs as soon as practical after operations cease.

END OF SECTION