Project Specification for

Westview Elementary School – Window and Door Replacement

at

60 Rolston Dr, Hamilton, ON L9C 3X7

For

Hamilton-Wentworth District School Board

20 Education Court

Hamilton, Ontario

HWDSB No: 2024-159-P01929

JFA Project: 2333

March 28, 2024

Jason Fung Architect Inc.

211-675 King St W, Toronto ON, M5V 1M9

647 948 9176 www.jasonfung.ca

1 GENERAL

1.1 OWNER

.1 Owner for the Project is:

Hamilton-Wentworth District School Board
20 Education Court
Hamilton, Ontario
L9A 0B9

1.2 CONSULTANTS

.1 The following firms comprise the Consultant team for the Project:

.1 Architect
JASON FUNG ARCHITECT INC.
211-675 King St W,
Toronto ON, M5V 1M9
647 948 9176
www.jasonfung.ca

.2 Designated Substance Audit Report
MTE Consultants Inc.
1016 Sutton Drive, Unit A
Burlington, Ontario
L7L 6B8

END OF SECTION

1 GENERAL

1.01 Section list

2 PRODUCTS

2.01 Not Used

.1 Not Used

3 EXECUTION

3.01 Not Used

.1 Not Used

END OF SECTION

1 GENERAL

1.01 DEFINITIONS

.1 Available Project Information: information identified in this Section, of any type, and in any form, and identified as Available Project Information. Available Project Information, or any part thereof, does not form part of the Contract Documents unless specifically incorporated into Contract Documents by means of copying, transcribing, or referencing, or is listed in the Agreement as a Contract Document.

.2 Contractor: synonymous with Bidder

1.02 USE AND RELIANCE UPON AVAILABLE PROJECT INFORMATION

.1 Available Project Information is made available to Bidders for the purpose of disclosing information that is available to the HWDSB.

.2 Per CCDC, Available Project information is made available to Bidders to fulfill the HWDSB duty to disclose all relevant Project information to Bidders.

.3 Do not consider the Available Project Information as a representation or warranty that the information is necessarily accurate, complete, or appropriate.

.4 Bidders are responsible for interpreting and forming their own conclusions about the Available Project Information, including consideration of the time the document was created. Bidders obtain specialist advice if necessary. JASON FUNG ARCHITECT INC., and HWDSB assume no responsibility for interpretations or conclusions made.

.5 In the event there is a conflict between the Contract Documents and the recommendations contained in the Available Project Information, the Contract Documents shall govern.

1.03 AVAILABLE PROJECT INFORMATION

.1 The following Available Project Information is not incorporated into the Contract Documents, but is made available to Bidders:

.1 Existing Hazardous Material Information

.2 Existing Building Drawings

.2 The following Available Project Information is incorporated into the Contract Documents:

.1 Existing Hazardous Material Information

.2 Existing Building Drawings

1.08 EXISTING HAZARDOUS MATERIAL INFORMATION

.1 A copy of a designated substance audit report with respect to Place of the Work is being made available as part of the Bid Documents; described as follows:

Titled: Westview Elementary School Window and Door Replacement

Designated Substance Audit Report, 60 Rolston Drive, Hamilton, ON;

File No.: 54678-100;

Dated: February 27, 2024;

Prepared by: MTE Consultants Inc.

.2 Reports identify location and type of designated substances found to be present at Place of the Work.

.3 Conditions at Place of the Work identified in the report are relevant only at time of survey.

.4 The condition of some building materials may have changed.

.5 Items discovered during execution of the Work that are not itemized within the report should be analytically tested by an accredited laboratory before further disturbance.

1.09 PROJECT DRAWINGS

.1 These drawings, issued with the Bid Documents, are listed under Available Project Information - Drawings in Section 00 01 15 – List of Drawings.

.1 Architectural drawings:

.1 Drawing title: [_____]

.2 Drawing issue date: [_____]

.3 Drawing prepared by: JASON FUNG ARCHITECT INC.

.1 Address: 211-675 KING ST W

.2 City: TORONTO

.3 [[Province] [Territory]]: [_____]

.2 Mechanical drawings:

.1 Drawing title: [_____]

.2 Drawing issue date: [_____]

.3 Drawing prepared by: [_____]

.1 Address: [_____]

.2 City: [_____]

.3 [[Province] [Territory]]: [_____]

.2 These drawings are not issued with the Bid Documents.

.1 [_____] drawings:

.1 Drawing title: [_____]

.2 Drawing issue date: [_____]

.3 Drawing prepared by: [_____]

.1 Address: [_____]

.2 City: [_____]

.3 [[Province] [Territory]]: [_____]

.2 A copy of these drawings is [attached at the end of the [_____] as Appendix [_____]] [available for viewing at the office of [_____]] [available as a digital file upon request from HWDSB.

1.10 RELATED INSTRUCTIONS

.1 Report any irregularities or changed surface conditions at the Place of the Work to HWDSB a minimum of 7 days before Bid close.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 WORK COVERED BY CONTRACT DOCUMENTS

.1 Work of this Contract comprises general construction and renovation of listed washrooms, located at Westview Elementary School, 60 Rolston Dr, Hamilton, ON L9C 3X7, and further identified in the Contract Documents.

1.03 CONTRACT METHOD

.1 Construct Work under contract.

.2 Employ suppliers and subcontractors assigned by Owner.

.3 Relations and responsibilities between Contractor and subcontractors assigned by Owner are as defined in Conditions of Contract. Assigned Subcontractors shall, in addition:

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

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

1.04 SUBMITTALS

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

.2 Submit Project construction progress schedule in accordance with 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

.3 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Submit project Waste Management Plan and Waste Reduction Workplan highlighting recycling and salvage requirements

.2 Submit calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating 75% of construction wastes recycled or salvaged

.4 Submit site-specific and Work Plan Health and Safety Plan in accordance with Section 01 35 29.06 - Health and Safety Requirements.

1.05 WORK BY OTHERS

.1 Co-operate with other Contractors in carrying out their respective works and carry out instructions from Consultant.

.2 Co-ordinate work with other contractors. If any part of work under this Contract depends for its proper execution or result upon work of another contractor, report promptly to Consultant and HWDSB, in writing, any defects which may interfere with proper execution of Work.

1.06 FUTURE WORK

.1 Not Used.

1.07 WORK SEQUENCE

.1 Construct Work in stages to accommodate Owner's intermittent use of premises during construction.

.2 Co-ordinate Progress Schedule and co-ordinate with Owner Occupancy during construction.

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

.4 Maintain fire access/control.

.5 Protect workers and public safety.

1.08 CONTRACTOR USE OF PREMISES

.1 Site Superintendent MUST SIGN IN with school office, Duration of work must be described, complete with timeline of completion. Sign-in and sign-out is required daily for all subtrades. Sign-in sheets will be provided to HWDSB on a monthly basis.

.2 Limit use of premises for Work and for access, to allow:

- .1 Owner occupancy.
- .2 Partial owner occupancy.
- .3 Work by other contractors.
- .4 Public usage.

.3 Co-ordinate use of premises under direction of HWDSB.

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

.5 Coordinate with HWDSB for temporary facilities, access roads and parking areas, traffic regulations, and utilities.

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

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

.8 Ensure that operations conditions of exiting work at completion are still the same, equal to or better than that which existed before new work started.

1.09 OWNER OCCUPANCY

.1 Owner will occupy premises during entire construction period for execution of normal operations.

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

1.10 PARTIAL OWNER OCCUPANCY

.1 Schedule and substantially complete designated portions of Work for Owner's occupancy prior to Substantial Performance of entire Work.

.2 Designated areas for Owner's occupancy.

.3 Owner will occupy designated areas for purpose of storage of furnishings and equipment and

installation of equipment.

.4 Execute Certificate of Substantial Performance for each designated portion of Work prior to Owner occupancy. Contractor shall allow:

.1 Access for Owner personnel.

.2 Use of parking facilities.

.3 Operation of HVAC and electrical systems.

.5 On occupancy, Owner will provide for occupied areas:

.1 Operation of HVAC and electrical systems.

.2 Maintenance.

.3 Security.

.6 Execute Partial Interim Certificate of Completion for each designated portion of Work prior to Owner occupancy. Contractor shall allow:

.1 Access for Owner personnel.

.2 Use of parking facilities.

.3 Operation of HVAC and electrical systems.

1.11 PRE-ORDERED PRODUCTS OR PRE-BID WORK

.1 Verify with Consultant and HWDSB if they have placed orders with suppliers for specific products and work, to expedite Work and for other purposes in Owner's interests.

.2 Take responsibility for purchasing, handling, and installing of pre-ordered products same as for other Contractor-furnished products.

.3 Sign a written agreement with designated supplier to require them to perform their work as provided in the Contract Document terms and conditions.

.4 Obtain necessary shop drawings for inclusion in maintenance manual in accordance with Section 01 33 00 - Submittal Procedures.

1.12 PRE-PURCHASED EQUIPMENT

.1 Refer to HWDSB for certain items of equipment have been pre-purchased.

.2 Ensure that the purpose for pre-purchasing these equipment is to ensure delivery to Site within required Project completion schedule.

.3 Obtain necessary shop drawings and proceed to co-ordinate details for installation, expedite, receive, unload, install, connect and test specified equipment, and be responsible for warranty.

.4 Include equipment specifications for pre-purchased items at end of project specification, printed on coloured paper for confirmation only.

.5 Notify Consultant and HWDSB in writing at least 5 calendar days in advance of date on which materials and equipment are required.

.1 Pick up materials and equipment no later than 10 calendar days after such date.

.6 Receive equipment Free on Board (F.O.B.), store and maintain equipment until installation.

1.13 OWNER FURNISHED ITEMS

.1 Owner Responsibilities for Owner Furnished Items only:

.1 Arrange for delivery of shop drawings, product data, samples, manufacturer's instructions, and certificates to Contractor.

.2 Deliver supplier's bill of materials to Contractor.

.3 Arrange and pay for delivery to site in accordance with Progress Schedule.

.4 Inspect deliveries jointly with Contractor.

.5 Submit claims for transportation damage.

.6 Arrange for replacement of damaged, defective or missing items.

.7 Arrange for manufacturer's field services; arrange for and deliver manufacturer's warranties and bonds to Contractor.

.2 Contractor Responsibilities:

.1 Designate submittals and delivery date for each product in progress schedule.

.2 Review shop drawings, product data, samples, and other submittals. Submit to Consultant notification of observed discrepancies or problems anticipated due to non-conformance with Contract Documents.

.3 Receive and unload products on Site.

.4 Inspect deliveries jointly with Owner; record shortages, and damaged or defective items.

.5 Handle products on Site, including uncrating and storage.

.6 Protect products from damage, and from exposure to elements.

.7 Assemble, install, connect, adjust, and finish products.

.8 Provide installation inspections required by public authorities.

.9 Repair or replace items damaged by Contractor or subcontractor on site (under their control).

1.14 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

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

.2 Use only elevators existing in building for moving workers and material.

.1 Investigate the status of existing elevators, in building, if they are functional and safe for moving workers and materials before the Work starts.

.2 Provide the required protection for passenger elevators walls, obtain HWDSB approval before using these elevators.

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

1.15 EXISTING SERVICES

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

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

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

.4 Establish location and extent of service lines in area of work before starting Work. Notify Consultant and HWDSB of findings.

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

.6 Provide temporary services to maintain critical building and tenant services.

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

.8 Where unknown services are encountered, immediately advise Consultant and HWDSB, and confirm findings in writing.

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

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

.11 Construct barriers, as required.

1.16 DOCUMENTS REQUIRED

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

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Reviewed Shop Drawings.

.5 List of Outstanding Shop Drawings.

.6 Change Orders.

.7 Other Modifications to Contract.

.8 Field Test Reports.

.9 Copy of Approved Work Schedule.

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

.11 Other documents as specified.

2 PRODUCTS

2.01 SELECTION OF PRODUCTS

.1 If requested by the Consultant, provide the following services and/or information:

.1 Assist the Consultant in determining qualified suppliers.

.2 Obtain proposals from suppliers.

.3 Make appropriate recommendations for consideration of Consultant.

.4 Notify Consultant of any effect anticipated by selection of product or supplier under consideration, on construction schedule and contract sum.

.2 On notification of selection, enter into purchase agreement with designated supplier.

2.02 CASH ALLOWANCE

.1 Expend cash allowance only as authorized by the Owner though the Consultant's written instructions.

.2 Include in Contract price the Contractor's charges for handling at site, including uncrating and storage, protection from elements and damage, labour, installation and finishing, testing, adjusting and balancing, and other expenses including overhead and profit on account of Cash Allowance in accordance with Article GC4.1 of the General Conditions of the Contract as amended.

.3 Credit the Owner with any unused portion of Cash Allowances in the statement for final payment.

.4 If a test made under payment by a specific allowance proves that the material or system is not in accordance with the Documents, then the subsequent testing including Owner's testing of replacement materials or systems shall be Contractor's expense and not taken from Cash Allowance.

.5 Add or deduct any variation in cost from the Cash Allowance. No adjustment will be made to Contractor's expense.

.6 The amount of each allowance includes the net cost of the product or service, delivery and unloading at the site.

.7 All refunds, trade and/or quantity discounts which the Contractor may receive in the purchase of goods under allowances, to be extended to the Owner.

.8 Receipted invoices covering all disbursements made by the Contractor under Allowances, to be submitted to the Consultant for audit.

.9 Where the Cash Allowance stipulates "Supply Only," the Contract Price and not the Cash Allowances include the installation and hook-up costs. The installation and hook-up of some equipment and materials are specified under other Sections of the Specifications. The General Contract includes the installation and hook-up not specified elsewhere.

.10 Contractor's profit and overhead on all Cash Allowances to be carried in his lump sum amount, not in the Cash Allowances.

3 EXECUTION

3.01 NOT USED

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 ACCESS AND EGRESS

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

1.03 USE OF SITE AND FACILITIES

.1 Execute work with least possible interference or disturbance to normal use of premises. Make arrangements with HWDSB 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 HWDSB will assign sanitary facilities for use by Contractor's personnel. Keep facilities clean.

.5 Use only elevators, existing in building for moving workers and material.

.1 Protect walls of passenger elevators, to approval of HWDSB prior to use.

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

.6 Closures: protect work temporarily until permanent enclosures are completed.

1.04 ALTERATIONS, ADDITIONS OR REPAIRS TO EXISTING BUILDING

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

1.05 EXISTING SERVICES

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

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

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

.4 Construct barriers as required.

1.06 SPECIAL REQUIREMENTS

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

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

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

.4 Ingress and egress of Contractor vehicles at site is limited to 5 vehicles.

1.07 SECURITY

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

.2 Security clearances:

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

.2 Obtain requisite clearance, as instructed, for each individual required to enter premises.

.3 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.

1.08 BUILDING SMOKING ENVIRONMENT

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2-[2008], Stipulated Price Contract.

1.02 CASH ALLOWANCES

.1 Refer to CCDC 2, GC 4.1.

.2 Include in Contract Price specified cash allowances.

.3 Cash allowances, unless otherwise specified, cover net cost to Contractor of services, products, construction machinery and equipment, freight, handling, unloading, storage, installation and other authorized expenses incurred in performing Work.

.4 Contract Price, and not cash allowance, includes Contractor's overhead and profit in connection with such cash allowance.

.5 Contract Price will be adjusted by written order to provide for excess or deficit to each cash allowance.

.6 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.

.7 Include progress payments on accounts of work authorized under cash allowances in Consultant's monthly certificate for payment.

.8 Prepare schedule jointly with Consultant, HWDSB and Contractor to show when items called for under cash allowances must be authorized by HWDSB for ordering purposes so that progress of Work will not be delayed.

.9 Amount of each cash allowance includes:

.1 Costs to Provide the specified Products, including supply, installation, and related costs, excluding Value Added Taxes.

.2 Subcontractor's and sub-Subcontractor's overheads and profits related to cash allowance.

1.03 CONTINGENCY ALLOWANCE

.1 Refer to CCDC 2, GC 4.2.

.2 Do not include in Contract Price, additional contingency allowances for products, installation, overhead or profit.

.3 Expenditures under contingency allowance will be authorized in accordance with procedures provided in CCDC 2, GC 6.1 - Changes CCDC 2, 6.2 Change Order and CCDC 2, 6.3 Change Directive.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 23-[2005], A Guide to Calling Bids and Awarding Contracts.

1.03 REQUIREMENTS

.1 Referenced specification Sections stipulate pertinent requirements for products and methods to achieve Work stipulated under each Alternative.

.2 Co-ordinate affected related Work and modify surrounding Work to integrate Work under each Alternative.

1.04 AWARD/SELECTION OF ALTERNATIVES

.1 Indicate variation of Bid Price for Alternatives described below and listed in Bid Form. Note that this form requests a 'difference' in Bid. Price by adding to or deducting from base Bid price.

.2 Bids will be evaluated on 'Base Bid' price. After determination of preferred Bidder, consideration will be given to Alternatives and Bid Price adjustments.

.3 In accordance with CCDC Document No. 23 - A Guide to Calling Bids and Awarding Contracts, low Bid Tender will be determined on basis of lowest Bid in accordance with Contract Documents on which Project is to be actually constructed, including those alternatives for which prices have been invited and which are to be incorporated in Work.

1.05 ALTERNATIVES

.1 Contractor may propose an Alternative wherever a Product or manufacturer is specified by proprietary name(s), unless there is accompanying language indicating that Alternatives will not be considered.

.2 Contractor may propose an Alternative wherever a Product or manufacturer is specified by proprietary name(s) and accompanied by language such as "or equal", "or approved equal", or other similar words. Do not construe such language as an invitation to unilaterally provide an Alternative without Consultant's prior written acceptance. Do not order or install any Alternative without a Supplemental Instruction or Change Order. Unauthorized Alternatives will be removed and replaced with specified Product by Contractor.

.3 Provided a proposed Alternative submission includes all of the information specified in this Section under Submission Requirements for Proposed Alternatives, Consultant will promptly review and accept or reject the proposed Alternative.

.4 Consultant may accept an Alternative if satisfied that:

.1 The proposed substitute Product is the same type as, is capable of performing the same functions as, interfaces with adjacent work the same as, and meets or exceeds the standard of quality, performance and, if applicable, appearance, warranty and maintenance considerations, of the specified Product,

.2 The proposed substitute manufacturer has capabilities comparable to the specified

manufacturer, and

.3 The Alternative provides a benefit to Owner.

.5 If Contractor fails to order a specified Product or order a Product by a specified manufacturer in adequate time to meet Contractor's construction progress schedule, Consultant will not consider that valid reason to accept an Alternative.

.6 If Consultant accepts an Alternative, and subject to Owner's agreement, the change in the Work will be documented in the form of either a Supplemental Instruction or Change Order.

.7 If an Alternative is accepted in the form of a Supplemental Instruction or Change Order, Contractor shall not revert to an originally specified Product or manufacturer without Consultant's prior written acceptance.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 REFERENCE STANDARDS

.1 Owner/Contractor Agreement.

.2 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2, Stipulated Price Contract.

1.02 APPLICATIONS FOR PROGRESS PAYMENT

.1 Refer to CCDC 2.

.2 Make applications for payment on account as provided in Agreement monthly as Work progresses.

.3 Date applications for payment last day of agreed monthly payment period and ensure amount claimed is for value, proportionate to amount of Contract, of Work performed and Products delivered to Place of Work at that date.

.4 Submit to HWDSB at least 14 days before first application for payment. Schedule of values for parts of Work, aggregating total amount of Contract Price, to facilitate evaluation of applications for payment.

1.03 SCHEDULE OF VALUES

.1 Refer to CCDC 2.

.2 Provide schedule of values supported by evidence as JASON FUNG ARCHITECT INC. may reasonably direct and when accepted by JASON FUNG ARCHITECT INC., be used as basis for applications for payment.

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

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

1.04 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.

.3 Ensure unit prices multiplied by quantities given equal material cost of that item in Schedule of Values.

1.05 PROGRESS PAYMENT

.1 Refer to CCDC 2.

.2 JASON FUNG ARCHITECT INC. will issue to HWDSB, no later than 10 days after receipt of an application for payment, certificate for payment in amount applied for or in such other amount as Consultant determines to be due. If JASON FUNG ARCHITECT INC. amends application, JASON FUNG ARCHITECT INC. will give notification in writing giving reasons for amendment.

1.06 SUBSTANTIAL PERFORMANCE OF WORK

.1 Refer to CCDC 2.

.2 Prepare and submit to JASON FUNG ARCHITECT INC. comprehensive list of items to be completed or corrected and apply for a review by JASON FUNG ARCHITECT INC. to establish Substantial Performance and Interim Completion of Work or substantial performance of designated portion of Work when Work is substantially performed if permitted by lien legislation applicable to Place of Work designated portion which Owner agrees to accept separately is substantially performed. Failure to include items on list does not alter responsibility to complete Contract.

.3 No later than 10 days after receipt of list and application, JASON FUNG ARCHITECT INC. will review Work to verify validity of application, and no later than 7 days after completing review, will notify Contractor if Work or designated portion of Work is substantially performed.

.4 JASON FUNG ARCHITECT INC.: state date of Substantial Performance of Work or designated portion of Work in certificate.

.5 Immediately following issuance of certificate of Substantial Performance of Work, in consultation with Consultant, establish reasonable date for finishing Work.

1.07 PAYMENT OF HOLDBACK UPON SUBSTANTIAL PERFORMANCE OF WORK

.1 Refer to CCDC 2.

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

.1 Submit application for payment of holdback amount.

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

.3 After receipt of application for payment and sworn statement, JASON FUNG ARCHITECT INC. will issue certificate for payment of holdback amount.

.4 Where holdback amount has not been placed in a separate holdback account, Owner will, 10 days prior to expiry of holdback period stipulated in lien legislation applicable to Place of Work, place holdback amount in bank account in joint names of Owner and Contractor.

.5 Amount authorized by certificate for payment of holdback amount is due and payable on day following expiration of holdback period stipulated in lien legislation applicable to Place of Work. Where lien legislation does not exist or apply, holdback amount is due and payable in accordance with other legislation, industry practice, or provisions which may be agreed to between parties. Owner may retain out of holdback amount sums required by law to satisfy liens against Work or, if permitted by lien legislation applicable to Place of Work, other third party monetary claims against Contractor which are enforceable against Owner.

1.08 PROGRESSIVE RELEASE OF HOLDBACK

.1 Refer to CCDC 2.

.2 Where legislation permits, if JASON FUNG ARCHITECT INC. has certified that Work of subcontractor or supplier has been performed prior to Substantial Performance of Work, Owner will pay holdback amount retained for such subcontract Work, or products supplied by such supplier, on day following expiration of holdback period for such Work stipulated in lien legislation applicable to Place of Work.

.3 In addition to provisions of preceding paragraph, and certificate wording, ensure that such subcontract Work or products is protected pending issuance of final certificate for payment and be responsible for correction of defects or Work not performed regardless of whether or not such was apparent when such certificates were issued.

1.09 FINAL PAYMENT

.1 Refer to CCDC 2, GC 5.7.

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

.3 JASON FUNG ARCHITECT INC. will, no later than 10 days after receipt of application for final payment, review Work to verify validity of application. JASON FUNG ARCHITECT INC. will give notification that application is valid or give reasons why it is not valid, no later than 7 days after reviewing Work.

.4 JASON FUNG ARCHITECT INC. will issue final certificate for payment when application for final payment is found valid.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 ADMINISTRATIVE

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

.2 Prepare agenda for meetings.

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

.4 Provide physical space and make arrangements for meetings.

.5 Preside at meetings.

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

.7 Reproduce and distribute copies of minutes within three days after meetings and transmit to meeting participants and, HWDSB, JASON FUNG ARCHITECT INC.

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

1.03 PRECONSTRUCTION MEETING

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

.2 Senior representatives of HWDSB, JASON FUNG ARCHITECT INC., major Subcontractors, field inspectors and supervisors will be in attendance.

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

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

.5 Agenda to include:

- .1 Appointment of official representative of participants in the Work.
- .2 Schedule of Work: in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.
- .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
- .5 Delivery schedule of specified equipment in accordance with Section 01 32 16.19.
- .6 Site security as necessary.
- .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
- .8 Owner provided products.
- .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.

.10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.

.11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.

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

.13 Appointment of inspection and testing agencies or firms.

.14 Insurances, transcript of policies.

1.04 PROGRESS MEETINGS

.1 During course of Work and 2 weeks prior to project completion, schedule progress meetings bi-weekly.

.2 Contractor, major Subcontractors involved in Work, HWDSB are to be in attendance.

.3 Notify parties minimum 3 days prior to meetings.

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

.5 Agenda to include the following:

.1 Review, approval of minutes of previous meeting.

.2 Review of Work progress since previous meeting.

.3 Field observations, problems, conflicts.

.4 Problems which impede construction schedule.

.5 Review of off-site fabrication delivery schedules.

.6 Corrective measures and procedures to regain projected schedule.

.7 Revision to construction schedule.

.8 Progress schedule, during succeeding work period.

.9 Review submittal schedules: expedite as required.

.10 Maintenance of quality standards.

.11 Review proposed changes for affect on construction schedule and on completion date.

.12 Other business.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 DEFINITIONS

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

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

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

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

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

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

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

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

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

1.03 REQUIREMENTS

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

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

.3 Limit activity durations to maximum of approximately 5 working days, to allow for progress reporting.

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

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

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

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

1.06 MASTER PLAN

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

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

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

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

1.07 PROJECT SCHEDULE

.1 Develop detailed Project Schedule derived from Master Plan.

.2 Ensure detailed Project Schedule includes as minimum milestone and activity types as follows:

.1 Award.

.2 Shop Drawings, Samples.

.3 Demolition

.4 Architecture (Walls).

.5 Plumbing.

.6 Lighting.

.7 Electrical.

.8 Heating, Ventilating, and Air Conditioning.

.9 Millwork.

.10 Testing and Commissioning.

.11 Supplied equipment long delivery items.

.12 Engineer supplied equipment required dates.

1.08 PROJECT SCHEDULE REPORTING

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

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

1.09 PROJECT MEETINGS

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

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

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

1.03 ADMINISTRATIVE REQUIREMENTS

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

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

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

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

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

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

.7 Verify site measurements and affected adjacent Work are coordinated.

.8 Contractor's responsibility for errors and omissions in submission is not relieved by HWDSB and JASON FUNG ARCHITECT INC review of submittals.

.9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by HWDSB and JASON FUNG ARCHITECT INC. review.

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

1.04 SHOP DRAWINGS AND PRODUCT DATA

.1 Refer to CCDC 2 GC 3.11.

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

.3 Submit drawings stamped and signed by professional engineer registered or licensed in ONTARIO, Canada.

.4 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 Contract drawings and specifications.

.5 Allow 5 days for HWDSB and JASON FUNG ARCHITECT INC. review of each submission.

.6 Adjustments made on shop drawings by HWDSB and JASON FUNG ARCHITECT INC. are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to

HWDSB before to proceeding with Work.

.7 Make changes in shop drawings as HWDSB and JASON FUNG ARCHITECT INC. may require, consistent with Contract Documents. When resubmitting, notify HWDSB and JASON FUNG ARCHITECT INC. in writing of revisions other than those requested.

.8 Accompany submissions with transmittal letter, containing:

.1 Date.

.2 Project title and number.

.3 Contractor's name and address.

.4 Identification and quantity of each shop drawing, product data, and sample.

.5 Other pertinent data.

.9 Submissions to include:

.1 Date and revision dates.

.2 Project title and number.

.3 Name and address of:

.1 Subcontractor.

.2 Supplier.

.3 Manufacturer.

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

.5 Details of appropriate portions of Work as applicable:

.1 Fabrication.

.2 Layout, showing dimensions, including identified site dimensions and clearances.

.3 Setting or erection details.

.4 Capacities.

.5 Performance characteristics.

.6 Standards.

.7 Operating weight.

.8 Wiring diagrams.

.9 Single line and schematic diagrams.

.10 Relationship to adjacent work.

.10 After HWDSB and JASON FUNG ARCHITECT INC. review, distribute copies.

.11 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as HWDSB and JASON FUNG ARCHITECT INC. may reasonably request.

.12 Submit [6] [electronic] copies of product data sheets or brochures for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC. where shop drawings will not be prepared due to standardized manufacture of product.

.13 Submit [6] [electronic] copies of test reports for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.

.1 Report signed by authorized official of testing laboratory that material, product or system

identical to material, product or system to be provided has been tested in accord with specified requirements.

.2 Testing must have been within 3 years of date of Contract award for project.

.14 Submit electroniC copies of certificates for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.

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

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

.15 Submit electronic copies of manufacturers instructions for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.

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

.16 Submit electronic copies of Manufacturer's Site Reports for requirements requested in specification Sections and as requested by HWDSB and JASON FUNG ARCHITECT INC.

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

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

.19 Delete information not applicable to project.

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

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

1.05 SAMPLES

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

.2 Deliver samples prepaid to HWDSB and JASON FUNG ARCHITECT INC

.3 Notify HWDSB and JASON FUNG ARCHITECT INC. in writing, at time of submission of deviations in samples from requirements of Contract Documents.

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

.5 Adjustments made on samples by HWDSB and JASON FUNG ARCHITECT INC. are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to HWDSB and JASON FUNG ARCHITECT INC. before proceeding with Work.

.6 Make changes in samples which HWDSB and JASON FUNG ARCHITECT INC may require, consistent with Contract Documents.

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

1.06 MOCK-UPS

.1 Erect mock-ups in accordance with section 01 43 00 - Quality Assurance.

1.07 PHOTOGRAPHIC DOCUMENTATION

.1 Submit electronic copy of colour digital photography in jpg format, standard resolution weekly with progress statement and as directed by HWDSB.

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

.3 Number of viewpoints: 2 images per window installation (interior and exterior)

.1 Viewpoints and their location as determined by HWDSB and JASON FUNG ARCHITECT INC.

.4 Frequency of photographic documentation: weekly as directed by HWDSB.

.1 Upon completion of: demolition, framing and services before concealment, and as directed by HWDSB.

1.08 CERTIFICATES AND TRANSCRIPTS

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section describes recommendations and requirements sourced from federal, provincial, and municipal public health authorities and Canadian construction associations to maintain a safer construction site.

.1 Prioritize the health and safety of persons at the Place of the Work from exposure to COVID-19.

.2 Establish and enforce a Project site-specific COVID-19 Safety Plan by the Contractor.

.2 Due to the rapidly changing nature of viral pandemics, if a conflict occurs between this Section and public health authority health measures or other government public health orders, give higher priority to public health authority recommendations and requirements.

1.02 RELATED REQUIREMENTS

1.03 ABBREVIATIONS AND ACRONYMS

.1 PHAC: Public Health Agency of Canada

.2 PPE: Personal Protection Equipment

1.04 DEFINITIONS

.1 COVID-19: Coronavirus disease 2019 is a contagious disease caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2)

.2 Disinfectants (hard surface): An agent capable of destroying pathogenic microorganisms or inhibiting their growth.

.3 Hand Sanitizer: Alcohol-based hand sanitizer containing at least 60% alcohol.

.4 Isolate: A specific series of actions as determined by the public health authority. These procedures are different from quarantine.
https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks.html#self

.5 Physical Distancing: Maintaining 2 m physical distance between persons.

.6 Quarantine: A specific series of actions as determined by the public health authority. These procedures are different from isolate.
https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks.html#self

.7 Surface Sanitizer: A substance, or mixture of substances, that reduces the population of infectious agents on environmental inanimate surfaces and objects. Surface sanitizers are not as effective as hard-surface disinfectants.

1.05 REFERENCE STANDARDS

.1 Government of Canada:

.1 Medical Devices Regulations, SOR/98-282

.2 Province of Ontario:

.1 Occupational Health and Safety Act, [2020]

.3 Canada Labour Code

.1 Canada Occupational Health and Safety and Regulations, [2021]

1.06 ACCESS TO SITE

.1 Before allowing access to site, perform screening of persons to confirm the following:

.1 They have not travelled outside of Canada within the past 14 days.

.2 To the best of their knowledge, they have not been in contact with someone with a confirmed or probable case of COVID-19.

.3 They have not recently worked on a different construction site that was shut down due to COVID-19.

.4 They are not currently exhibiting flu-like symptoms (such as cough, fever, shortness of breath, runny nose, or sore throat).

.5 Check person's temperature with temperature measuring device.

.2 Discourage persons from entering the Project site who are at an increased risk of developing a serious response to COVID-19, such as:

.1 older adults

.2 persons with underlying medical conditions

.3 persons with compromised immune systems

.3 Responses and results of screening measures, whether a person is permitted on site or not, is considered private and sensitive medical information.

.4 If a person arrives at the Project site but is suspected of having COVID-19, prohibit them from entering the site. Recommend they go directly back home or other location for isolation. When a person is unable to safely transport themselves, arrange a vehicle and driver.

.5 When transporting a potentially ill person, both driver and passenger must wear masks and nitrile gloves. Seat passenger in the backseat. Driver shall open and close doors to minimize touch points.

1.07 ADMINISTRATIVE REQUIREMENTS

.1 Comply with COVID-19 restrictions requirements from applicable federal, provincial, and local statutes, regulations, and ordinances.

.2 Be responsible for implementing, monitoring, and enforcing daily site-specific COVID-19 Safety Plan.

.3 Give precedence to safety and health of persons on site over cost and schedule considerations.

.4 Personal Protective Equipment: Verify that safety equipment and protective clothing is kept clean and maintained in good condition.

.5 Develop protective equipment usage procedures and ensure that procedures are followed by persons on site; include the following procedures at a minimum:

.1 Dispose of or disinfect PPE worn on site at end of each shift.

.2 Disinfect reusable PPE before reissuing.

.3 Ensure appropriate PPE is worn properly during work activities.

.6 Verify persons understand the proper use of PPE or educate persons on their proper use.

.1 Proper fitting of mask straps.

.2 Fit check persons for PPE each time PPE is worn.

.3 For flat fold respirators make sure panels are fully unfolded.

.4 Mask noseclip moulded around the nose and cheeks to give a good seal. Using both hands, mould noseclip to the shape of the lower part of the nose to ensure a close fit and effective seal. Check for air leaks around nose and at mask edges.

.7 Helpful literature on effective use of masks is available from Canadian Centre for Occupational Health and Safety. English: **https://www.ccohs.ca/covid19/facts-on-masks/**

.8 Where practical, persons to work remotely.

.9 Maintain physical distancing measures.

.10 Reorganize workflow when possible.

.11 When minimum physical distancing cannot be maintained, wear masks, face coverings, and face shields.

.12 Communicate Contractor's COVID-19 Safety Plan to Subcontractors and other persons on site. Post COVID-19 Safety Plan at the Place of the Work, including near site entrance(s).

.13 Subcontractors and other persons to comply with the following practices to reduce the risk of COVID-19 transmission as identified by the Public Health Agency of Canada (PHAC), Health Canada, and US Centers for Disease Control and Prevention:

.1 Avoid touching eyes, nose, and mouth with unwashed hands

.2 When coughing or sneezing:

.1 Cough or sneeze into a tissue or the bend of your arm. Do not cough or sneeze into your hand.

.2 Dispose of used tissues as soon as possible into a lined waste container. Wash your hands afterwards.

.3 Non-medical face-coverings should be worn as a potential mitigant to catching and transmitting the virus, but are not a substitute for proper handwashing, physical distancing, and other protective measures. Do not wear a mask when it will put a person at safety risk (e.g. when it may get caught in machinery). Use face-coverings in line with the PHAC guidelines.
https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection/prevention-risks/about-non-medical-masks-face-coverings.html

.14 Do not share personal items or supplies, such as phones, pens, notebooks, tools, and PPE.

.15 Use and remove PPE carefully. Be mindful of which PPE surfaces may be contaminated. Wash hands after handling used PPE.

.16 Wash hands often with soap and water for at least 20 seconds after using the washroom, before handling food, after blowing nose, after coughing, after sneezing, and before smoking. If hands are not visibly soiled and soap/water are unavailable, use hand sanitizer instead.

.17 Travel:

.1 Travel to and from Project site:

.1 Non-essential persons are not permitted access to the Project site.

.2 When possible, travel to Project site using one person per vehicle. Carpooling is discouraged. Arrange for additional temporary site parking as required.

.3 When possible, at the end of a person's shift, change out of work clothes before entering vehicle. Handle work clothes carefully and wash upon arriving home.

.4 Monitor persons entering and exiting the Project site, and control entrances to ensure physical distancing is maintained, especially when shifts begin and end.

.5 When practical, stagger person's shift start and end times in five-minute intervals to encourage physical distancing.

.2 Business-Related Travel:

.1 Avoid non-essential business travel. Limit business travel and on an exceptional basis only.

.2 When returning from out-of-country travel, undergo a 14-day self-isolation period.

.3 Some provincial governments impose similar restrictions for inter-provincial travel. Where occurring, comply with provincial requirements for self-isolation.

.4 **https://travel.gc.ca/travel-covid**

1.08 COORDINATION

.1 Coordination with Building Occupants:

.1 Strictly enforce minimum physical distancing measures between persons when working in Owner-occupied areas. Separate Subcontractors and Owner's personnel in different isolated areas where possible.

.2 Non-emergency work should not be done in any occupied spaces where an occupant is suspected to have contracted COVID-19 or is under self-isolation (per the directions of the applicable authorities). Perform emergency work only if Subcontractors are fully equipped with nitrile gloves, Tyvek suits or equivalent coveralls, and facial/respiratory protection.

.3 Thoroughly clean hands and tools before entering the occupied space and immediately after leaving. Disinfect affected surfaces and equipment in the occupied space immediately before leaving the occupied space.

.2 Site Coordination:

.1 Locate temporary facilities to avoid overcrowding of high-traffic areas and maintain physical distancing.

.2 Encourage Subcontractors to propose split or alternating shifts to avoid density of persons. Encourage Subcontractors to work in multiple shifts, with time gaps between shifts.

.3 Assign vehicles, equipment, and tools to a single person, or to the minimum number of persons required for safe use.

.3 Close-Proximity Activities:

.1 Ensure persons maintain physical distancing. Where this is not possible due to task-specific safety risks, perform a risk assessment to identify alternative controls to protect persons' health and safety. This might include methods to minimize the duration, adjust proximity to the task, use of physical controls (such as clear plastic barriers), and PPE.

.2 Maintain a record of tasks requiring close-proximity activities, including the task-specific safety risks that justify close-proximity and the control measures implemented to protect persons from the risk of infection. Review record regularly to consider if additional safety measures can be implemented.

1.09 MEETINGS

.1 COVID-19 Safety Meetings: Conduct mandatory COVID-19 safety meetings, and review ongoing safety issues. Include refresher safety meetings if COVID-19 Safety Plan is revised.

.2 Project Meetings:

.1 Hold meetings by teleconferencing or videoconferencing where possible.

.2 Avoid common physical greetings, such as handshakes.

.3 Arrange furniture to maintain physical distancing.

.4 Minimize number of in-person meetings. If required, meetings should involve only necessary individuals and include six people or fewer. When possible hold meetings in open spaces. If required, hold 'Toolbox Talks' and similar meetings in multiple sessions to maintain physical distancing.

1.10 SEQUENCING AND SCHEDULING

.1 Scheduling:

.1 Schedule work to avoid crossover of persons between different crews.

.2 Stagger Subcontractors' break and lunch schedules to encourage physical distancing. Make enclosed lunchrooms available only during poor weather.

.3 Adjust persons' schedules to allow time for proper cleaning and disinfecting.

.2 Record and monitor the health status of Subcontractors and other persons on-site:

.1 Perform detailed monitoring of persons' status on-site.

.2 Keep records of persons' health status off site (e.g., whether they are healthy, sick, not working due to caring for family, or other applicable categories). Maintain a current list of quarantined persons and isolating persons. Comply with privacy legislation.

.3 Keep records of which persons work closely together and dates.

1.11 RESPONSE MEASURES

.1 Persons potentially exposed to COVID-19, or who are exhibiting flu-like symptoms, such as fever, tiredness, coughing, or congestion must

.1 stay at home and isolate,

.2 avoid entering the Project site,

.3 notify their supervisor,

.4 contact public health authority for further directions,

.5 follow the directions of the public health authority and not enter Project site until recommended by the public health authority.

.2 If flu-like symptoms first develop while on site then avoid touching anything, take extreme care to contain coughs and sneezes, immediately return home, and self-isolate.

.3 Where Project site areas are potentially contaminated by an infected person or probable infected person, barricade areas to keep persons two metres away until the area is cleaned and disinfected.

1.12 SUBMITTALS

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

.1 Product Data: Submit product data for PPE, disinfectants, and sanitizers when requested.

.2 Site Quality Control Submittals: Submit site plan indicating locations of temporary facilities, site entrances, and other segregated areas that encourage physical distancing when requested.

.3 Special Procedure Submittals: Before mobilization on site, submit Contractor's site-specific COVID-19 Safety Plan. Plan to address contents of this Section and current public health authority recommendations and requirements.

.1 Develop checklist for items requiring daily inspection.

.2 Address operating procedures and PPE program, and as follows:

.1 Procedures for wearing and removing PPE

.2 PPE selection based upon site conditions

.3 PPE use and limitations

.4 PPE maintenance and storage

.5 PPE disinfection and disposal

.6 PPE inspection procedures prior to, during, and after use.

.7 Site control measures employed at site including identification of nearest medical assistance.

.8 Disinfection procedures for both persons, equipment, and objects.

.9 Emergency response requirements addressing: safe distancing, PPE, site layout, and procedures for reporting incidents to public health authority.

1.13 DELIVERY, STORAGE, AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Post temporary signage to clearly indicate delivery areas. Limit delivery areas to receivers and deliverers only.

.2 Avoid passing items between deliverer and receiver when possible (e.g., shipment documents and pens for signatures). Delivery persons shall remain in their vehicles while receiving persons unload the delivery materials wearing PPE.

1.14 SITE CONDITIONS

.1 Post clear temporary signage at entry points to the Project site. Identify health and safety measures during the COVID-19 pandemic. Update signage when public health authorities revise COVID-19 mitigation recommendations and requirements.

.1 COVID-19 awareness posters by Government of Canada are available: **https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronaviru**

s-infection/awareness-resources.html

.2 Mitigate Interior Touch Areas:

.1 Limit access and use of shared devices, such as coffee machines, water fountains, and microwave ovens. Provide means to clean and disinfect such devices between uses.

.2 Limit use of common-use pens. Encourage persons to carry their own (such as for sign-in sheets).

.3 Washroom Modifications: Install additional temporary sinks, and increase distance between sinks where practical. Temporarily replace faucet handles, paper towel dispensers, and garbage cans to hands-free models where practical.

.4 Where touch points like door handles and water coolers remain, provide paper towels to avoid skin contact.

.5 Wear gloves at the Place of the Work when possible. Consider glove surfaces to have the same risk as the surfaces of bare hands. Avoid unnecessary touching of anything on site.

.3 Compartmentalization:

.1 Where possible segregate Project site into zones or other methods to keep different Subcontractors physically or temporally separated. Promote physical distancing. If virus spreads on site, support containment.

.2 Restrict eating to clearly labelled dedicated eating areas. Provide temporary handwashing stations, cleaning and disinfectants, with adequate space to maintain physical distancing.

.3 Establish upper limits on number of people allowed in each zone and inside facilities (washrooms, trailers, and eating areas) to encourage physical distancing.

.4 Label and enforce one-way staircases where practical.

.5 Limit freight elevators to one person capacity where practical.

2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

.1 The province or municipality may have implemented stricter orders or measures than those indicated in this Section. At the Project site, monitor and enforce compliance with COVID-19-related safety regulations and measures required by the public health authority.

2.02 MATERIALS

.1 Protective Clothing Devices:

~~.1 Eye Protection: [_____][Protective goggle] [protective spectacles] [or safety over-spectacles type] [polycarbonate] [acetate] [with anti-fogging features].~~

~~.2 Face Shields: [_____][Medical face shield] [2-layer polypropylene with PETG visor] [with clear polycarbonate visor] [Nominal Protection Factor: [50] [500]].~~

~~.3 Gloves: [_____][vinyl examination gloves] [nitrile]~~

~~.4 Masks: [disposable] [for non-medical use] [surgical masks] [face masks] [protective full face masks] [surgical face masks] [N95 particulate respirator] [disposable medical face mask] [medical face mask] [non-woven face mask] [_____]. Mask [conforms well to the size and~~

~~shape of face] [does not interfere with eyewear or other PPE items] [does not cause misting of eyewear]. Spandex neck gaiters or cotton bandanas are not acceptable.~~

~~.5 [Protective Coverall]: [_____][CE Category III, Protection Type [1] [5/6] (gas tight) to EN 943-1] [polyester].~~

.2 Temperature Measuring Devices: Accurate, rapid results, does not require physical contact, handheld thermography camera.

.3 Cleaning, Disinfecting, and Sanitizing Products:

.1 Use hard-surface disinfecting products approved for use by Health Canada against COVID-19.

.2 Cleaning Products and Hand Soaps: Comply with the Food and Drugs Act, the Canada Consumer Product Safety Act, and the Hazardous Products Act. Health Canada may have implemented an interim policy to allow some exceptions.

.3 Hand Sanitizers: Products that are authorized for sale in Canada with a minimum 60% alcohol content.

.4 Government of Canada list of hard-surface disinfectants and hand sanitizers with evidence for use against COVID-19:

.1 **https://www.canada.ca/en/health-canada/services/drugs-health-products/disinfectants/covid-19/list.html**

3 EXECUTION

3.01 INSTALLATION

.1 Doors: Delay installation of permanent doors, temporarily remove doors, or temporarily replace door handles with hands-free hardware, such as foot-pull devices where practical.

3.02 SITE QUALITY CONTROL

.1 Site Quality Control Procedures:

.1 Be responsible for ensuring appropriate health and safety measures have been implemented, and that directions of the public health authority are followed for persons returning to work after a presumed or confirmed infection of COVID-19.

.2 Site Tests and Inspections: Periodically monitor to verify COVID-19 Safety Plan procedures are maintained.

3.03 CLEANING

.1 Cleaning: Establish Project site cleaning protocols.

.1 Perform frequent cleaning and disinfecting of frequently touched objects and surfaces in common areas at Project site at the end of shifts, minimum twice per day, including the following:

.1 cabinet and drawer pulls

.2 controls

.3 commonly touched surfaces on vehicles

.4 countertops

.5 credit and debit cards

.6 door handles

.7 elevator buttons

.8 faucet handles

.9 guardrails and handrails

.10 ladders

.11 light switches

.12 personal workstations

.13 phones

.14 reusable PPE

.15 shared tools and construction equipment

.16 steering wheels

.17 tables

.18 toilets

.2 Perform cleaning and disinfecting following PHAC's recommended methods.

.1 **canada.ca/en/public-health/services/publications/diseases-conditions/cleaning-disinfecting-public-spaces.html**

.3 Locate additional sanitary measures on site. Post hand washing protocols at hand washing stations and at hand sanitizer stations. Supply disinfectant wiping products for use on site. Locate these types of facilities at site entrances, exits, washrooms, eating areas, offices, and other areas with commonly touched surfaces.

.2 Waste Management: Provide suitable disposal containers with liners for single-use PPE and contaminated PPE.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 02 81 00 - Hazardous Materials

1.02 REFERENCE STANDARDS

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

.2 Province of Ontario

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

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:

.1 Results of site specific safety hazard assessment.

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

.3 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to HWDSB, and authority having jurisdiction.

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

.5 Submit copies of incident and accident reports.

.6 Submit WHMIS Safety Data Sheets (SDS) in accordance with Section 01 47 15 - Sustainable Requirements: Construction and Section 02 81 00 - Hazardous Materials.

.7 HWDSB 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 HWDSB within 5 days after receipt of comments from HWDSB.

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

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

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

1.04 FILING OF NOTICE

.1 File Notice of Project with Ontario 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.

1.05 SAFETY ASSESSMENT

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

1.06 MEETINGS

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

1.07 REGULATORY REQUIREMENTS

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

1.08 PROJECT/SITE CONDITIONS

1.09 GENERAL REQUIREMENTS

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

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

1.10 RESPONSIBILITY

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

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

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

1.11 COMPLIANCE REQUIREMENTS

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

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

1.12 UNFORSEEN HAZARDS

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

1.13 HEALTH AND SAFETY CO-ORDINATOR

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

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

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

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

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

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

1.14 POSTING OF DOCUMENTS

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

1.15 CORRECTION OF NON-COMPLIANCE

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

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

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

1.16 BLASTING

.1 Blasting or other use of explosives is not permitted.

1.17 POWDER ACTUATED DEVICES

.1 Use powder actuated devices only after receipt of written permission from HWDSB.

1.18 WORK STOPPAGE

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

2 PRODUCTS

2.01 NOT USED

.1 Not used.

3 EXECUTION

3.01 NOT USED

.1 Not used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section describes administrative and procedural requirements for reactive activities to verify that completed Work conforms to Contract Documents requirements.

.2 Having inspection and testing agencies by Contractor does not relieve the Contractor of their responsibility to perform Work in accordance with Contract Documents.

1.02 RELATED REQUIREMENTS

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Cash Allowances for independent inspection and testing services to be retained and paid for by the Contractor as described in Section 01 21 00 – Allowances. This Cash Allowance(s) excludes any inspection and testing that is for the Contractor's own quality control, and excludes inspection and testing required by authority having jurisdiction.

.2 Allow and coordinate access to Work on site, manufacturing off site, and fabrication off site with inspection and testing agencies.

.3 Retain and pay for inspection and testing that are designated for Contractor's own quality control plan, and when testing and inspection are required by AHJ.

.4 Give advanced notice to HWDSB and to each inspection/testing agency for inspection and testing required by Contract Documents or by AHJ.

.5 In advance of each test, notify appropriate agency and HWDSB in the order that attendance arrangements can be made.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit schedule of testing and inspection activities to HWDSB, applicable Subcontractors, testing agencies, and other affected parties. Include the following:

.1 List each testing and inspection agency

.2 Identify types of tests and inspections for each agency, and cross reference to applicable specification Section number-title in Contract Documents

.3 Description of test and inspection

.4 Identify applicable reference standard

.5 Identify test and inspection method

.6 Indicate number of each test and inspection required

.3 Submit one digital copy of each quality assurance inspection and test report to HWDSB, except where a technical specification Section indicates otherwise.

.4 Submit reports for inspection and testing required by Contract Documents or by AHJ and performed by Contractor-retained inspection and testing agencies within ten days after inspection or test is completed, except where a technical specification Section indicates a different time period.

.5 Submit[one digital copy of each quality control inspection and test report to HWDSB, except where a technical specification Section indicates otherwise.

.6 Deliver copies of quality control reports to Subcontractor of work being inspected or tested.

1.05 SOURCE QUALITY CONTROL PROCEDURES

1.06 SITE QUALITY CONTROL PROCEDURES

.1 Provide labour, Construction Equipment, and temporary facilities to obtain and handle test samples and materials on site. Arrange for sufficient space to store and cure test samples.

.2 Deliver samples and materials required for testing, as requested in technical specification Sections. Submit with reasonable promptness and in an orderly sequence to avoid delays in Work.

1.07 TESTING AND INSPECTION SERVICES

.1 HWDSB will retain and pay for independent inspection and testing agencies to inspect, test, or perform other quality control reviews of parts of the work, except where indicated otherwise.

.2 Provide equipment required for executing inspection and testing by appointed agencies.

.3 Correct defects and deficiencies when they are revealed during inspection or testing as advised by HWDSB at no change to Contract Price or Contract Time. Pay costs for retesting and re-inspection. Appointed agency will request additional inspections or tests to ensure full degree of defects or deficiencies are revealed and corrected.

.4 Quality control testing and inspection reports to include the following:

.1 Project name and number

.2 Testing/Inspection agency's name, address, telephone number, and website

.3 Date of issuing report

.4 Dates and locations of tests, inspections, or samples

.5 Description of the Work and test and inspection method

.6 Numbers and titles of associated specification Sections

.7 Test and inspection data and interpretation of test results (e.g., pass or fail)

.8 Ambient conditions at time of test, inspection, or sampling

.9 Recommendations on re-testing and re-inspecting, if applicable

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit the following before work begins at the Place of the Work:

.1 Service locations: Document locations and extents of service lines in the work area.

.3 Submit the following informational submittals as work progresses:

.1 Test reports: For manufacturer-recommended pre-installation site tests.

.1 Indicate test results meet manufacturer's requirements and recommendations.

.2 When manufacturer's requirements are not met, submit manufacturer's corrective recommendations for review.

.4 Submit the following when requested by the HWDSB:

.1 Site quality control submittals: Documentation to verify accuracy of engineering work.

1.03 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 – Closeout Submittals.

1.04 QUALIFICATION ASSURANCE

.1 Not Used.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 EXAMINATION

.1 Existing Services:

.1 Confirm locations and extent of service lines in work area before beginning work on site. Submit findings.

.2 Immediately notify the HWDSB if unknown services are encountered. Confirm findings in writing.

.3 Record locations of maintained, re-routed, and abandoned service lines after completion of the Work. Submit findings.

.2 Verify substrate and other conditions are acceptable for installation of materials, assemblies, and systems in accordance with required tolerances and manufacturer's instructions and recommendations.

.1 Examine conditions, with installers, for defects affecting performance of the Work. Where work of one Section depends on work of other Sections being properly completed, verify that work is complete and suitable to receive the subsequent work.

.2 Verify substrate surfaces are clean, dimensionally-stable, cured, and free of contaminants.

.3 Proceed with installation after unacceptable conditions are remedied.

.4 Starting to cut, patch, or install work will be considered Contractor's acceptance of existing conditions.

.5 Monitor conditions as Work proceeds, including items subject to damage or movement during cutting and patching.

.3 Perform manufacturer-recommended pre-installation site tests.

3.02 PREPARATION

.1 Protection of In-Place Conditions:

.1 Protect Work and items to remain from damage.

.2 Do not load, or permit to be loaded, anything with a weight or force that may endanger the safety or integrity of the Work or items to remain.

.3 Support structural integrity of surroundings.

.4 Protect exposed work from weather and other potentially damaging conditions. Keep excavations free of water.

.5 Promptly remove, replace, clean, or repair elements damaged due to inadequate protection, as acceptable to the HWDSB, and at no change to the Contract Price or Contract Time.

.2 Surface Preparation:

.1 Clean surfaces thoroughly before installation.

.2 Prepare surfaces using manufacturer-recommended methods to achieve acceptable substrates under project conditions.

3.03 SURVEY REQUIREMENTS

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 SECTION INCLUDES

.1 Common requirements for installing, applying, and erecting products. Includes procedures and submittals for cutting and patching to existing conditions, and required repairs arising from tests and destructive inspections.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit proof of anchor and fastener load carrying capacity for a work result, when requested.

.3 Submit written request before cutting or altering to existing conditions which may affect the following:

.1 structural integrity of existing elements: Submit structural details and calculations performed by a professional structural engineer registered or licensed in Ontario, Canada. Include evidence of unsatisfactory structural integrity of the elements according HWDSB.

.2 integrity of weather-exposed and moisture-resistant elements

.3 efficiency, maintenance, safety, or accessibility of operational elements

.4 visual qualities of sight-exposed elements.

.5 Work of HWDSB and other Contractors

.4 Submit a request for cutting or altering which includes:

.1 identification of the Project; and

.2 location and description of affected existing conditions including changes to structural elements, function of elements, and visual appearance of existing elements; and the location and identification of utilities that will be temporarily out of service during cutting and patching activities.

.5 Submit site plan drawings indicating relative location of various services and equipment upon the request of HWDSB

.6 Submit a work plan including:

.1 a statement why cutting or altering is unavoidable and describe alternatives to cutting and patching if available;

.2 a description of proposed work and proposed Products;

.3 the effect of cutting or altering on work by Owner or other contractors;

.4 written acknowledgement by other contractors affected by cutting or altering, if applicable; and

.5 proposed date(s) and time(s) work will be executed.

1.04 QUALIFICATIONS

.1 Licensed Professionals: Engage a structural engineer licensed at the Place of the Work, to submit

details and calculations when altering existing structural elements.

2 PRODUCTS

2.01 MATERIALS

.1 Patching Materials: If possible, use the same materials found in the existing conditions, except in fire-resistance rated materials and assemblies.

.2 Materials Visible from the Floor Area: Use materials that visually match existing adjacent surfaces, and match existing functional performance.

3 EXECUTION

3.01 COMMON INSTALLATION/APPLICATION/ERECTION REQUIREMENTS

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

.2 Remove and replace defective and non-conforming Work.

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

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

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

.6 Provide openings in non-structural elements for penetrations of mechanical and electrical work.

.7 Conceal pipes, ducts and wiring in floor, wall, partition, and ceiling assemblies in finished areas, except where indicated otherwise.

.8 In addition to the manufacturer's recommendations for safety, access, accessibility, and maintenance, locate equipment, fixtures, and distribution systems where it shall provide minimal interference and shall maximize on usable space.

.1 Location of equipment, fixtures, and outlets indicated on Drawings and specifications are approximate.

.2 Notify HWDSB of impending installation and obtain approval for actual locations.

3.02 BRACING AND ANCHORING

.1 Anchors and Fasteners: Unless otherwise indicated elsewhere:

.1 Provide any necessary anchors and fasteners to fasten each component securely for its intended purpose. Allow for building movement, including from thermal expansion and contraction of materials and assemblies;

.2 prevent electrolytic reaction between dissimilar metals and materials;

.3 Provide hot-dip galvanized or stainless steel anchors and fasteners for securing exterior work;

.4 locate anchors and fasteners within individual load limit or shear capacity. Ensure anchors and fasteners are permanently secured;

.5 Where exposed to view, evenly distribute anchors and fasteners in a single area; and

.6 Where exposed to view, provide metal anchors, fasteners, and related accessories with the same texture, colour, and finish as adjacent materials.

.2 Non-Conforming Work: Anchors and fasteners installed which cause substrate cracks or spalling is not acceptable.

3.03 CUTTING AND PATCHING

.1 Proceed with cutting and patching after the review and acceptance by the HWDSB of all submittals.

.2 Perform cutting, fitting, and patching to complete Work in accordance with related technical specification Sections.

.3 Use special techniques to avoid damaging existing conditions that will remain, and which will result in proper surfaces to receive patching and finishing.

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

.5 Cut rigid materials using masonry saw, core drill, or other tool recommended by the product manufacturer or applicable industry association. Pneumatic or impact tools are not allowed on masonry work without the approval of HWDSB.

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

.7 Refinish surfaces to match adjacent finishes. Refinish continuous surfaces to nearest intersection (e.g., edges of partition). Refinish assemblies by refinishing entire unit. Provide entire surface with uniform finish, colour, and texture.

3.04 ADJUSTING

.1 Remove and replace patching that is visually unsatisfactory to HWDSB and JASON FUNG ARCHITECT INC.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2, Stipulated Price Contract.

1.03 PROJECT CLEANLINESS

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

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

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

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

.5 Provide on-site 40 yard bin containers for collection of waste materials and debris.

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

.7 Dispose of waste materials and debris off site.

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

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

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

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

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

1.04 FINAL CLEANING

.1 Refer to CCDC 2, GC 3.14.

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

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

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

.5 Remove waste products and debris including that caused by Owner or other Contractors.

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

HWDSB. Do not burn waste materials on site, unless approved by HWDSB.

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

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

.9 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, and floors.

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

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

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

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

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

.15 Remove dirt and other disfiguration from exterior surfaces.

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

.17 Sweep and wash clean paved areas.

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

.19 Clean roofs, downspouts, and drainage systems.

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

.21 Remove snow and ice from access to building.

1.05 WASTE MANAGEMENT AND DISPOSAL

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 This Section includes requirements for management of construction waste and disposal, which forms the Contractor's commitment to reduce and divert waste materials from landfill and includes the following:

.1 Preparation of a Draft Construction Waste Management Plan that will be used to track the success of the Construction Waste Management Plan against actual waste diversion from landfill.

.2 Preparation of a Construction Waste Management Plan that provides guidance on a logical progression of tasks and procedures to be followed in a pollution prevention program to reduce or eliminate the generation of waste, the loss of natural resources, and process emissions through source reduction, reuse, recycling, and reclamation.

.2 Owner has established that this Project shall generate the least amount of waste possible and that processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors be employed by the Contractor.

1.02 RELATED REQUIREMENTS

1.03 DEFINITIONS

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

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

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

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

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

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

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

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

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

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

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

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

run off water.

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

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

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

.16 Volatile Organic Compounds (VOC's): Chemical compounds common in and emitted by many building products over time through outgassing:

.1 Solvents in paints and other coatings;

.2 Wood preservatives; strippers and household cleaners;

.3 Adhesives in particleboard, fiberboard, and some plywood; and foam insulation.

.4 When released, VOC's can contribute to the formation of smog and can cause respiratory tract problems, headaches, eye irritations, nausea, damage to the liver, kidneys, and central nervous system, and possibly cancer.

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

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

1.04 REFERENCE STANDARDS

.1 ASTM International (ASTM)

.1 ASTM E1609 01, Standard Guide for Development and Implementation of a Pollution Prevention Program – Note, the standard was withdrawn in 2010, however contains relevant information to aid Contractor with preparation of waste diversion plans.

.2 Recycling Certification Institute (RCI)

.1 RCI Certification Construction and Demolition Materials Recycling

1.05 ADMINISTRATIVE REQUIREMENTS

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

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

1.06 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.1 Draft Construction Waste Management Plan (Draft CWM Plan): Submit to HWDSB a preliminary analysis of anticipated site generated waste by listing a minimum of five (5) construction or demolition waste streams that have potential to generate the most volume of material indicating methods that will be used to divert construction waste from landfill

and source reduction strategies; HWDSB will provide commentary before development of Contractor's Construction Waste Management Plan.

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

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

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

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

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

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

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

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

1.07 PROJECT CLOSEOUT SUBMITTALS

.1 Record Documentation: Submit as constructed information in accordance with Section 01 78 00 - Closeout Submittals as follows:

.1 Construction Waste Management Report (CWM Report): Submit a [CWM Report] for this Project in a format acceptable to submittal requirements and that includes the following information:

.1 Accounting: Submit information indicating total waste produced by the Project.

.2 Composition: Submit information indicating types of waste material and quantity of each material.

.3 Diversion Rate: Submit information indicating total waste diverted from landfill as a percentage of the total waste produced by the Project.

.4 Transportation Documentation: Submit copies of transportation documents or shipping manifests indicating weights of materials, and other evidence of disposal indicating final location of waste diverted from landfill and waste sent to landfill.

.5 Alternative Daily Cover (ADC): Submit quantities of material that were used as ADC at landfill sites, and that form a part of the total waste generated by the Project.

.6 Multiple Waste Hauling: Compile all information into a single CWM Report where multiple waste hauling and diversion strategies were used for the project.

.7 Photographs: Submit photographs of waste diversion facilities documenting location and signage describing usage of waste separation containers.

1.08 QUALITY ASSURANCE

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

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

.2 Waste-to-Energy Systems: Investigate local waste-to-energy incentives where systems for diverting materials from landfill for reuse or recycling are not available.

.2 Certifications: Provide proof of the following during the course of the Work:

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

1.09 DELIVERY, STORAGE, AND HANDLING

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

.2 Handling Requirements: Clean materials that are contaminated before placing in collection containers and ensure that waste destined for landfill does not get mixed in with recycled materials:

.1 Deliver materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to recycling process.

.2 Arrange for collection by or delivery to the appropriate recycling or reuse facility.

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 (CWM PLAN) IMPLEMENTATION

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

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

.3 Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage,

reuse, composting and return methods being used for the Project to Subcontractor 's at appropriate stages of the Project.

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

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

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

.5 Progressive Documentation: Submit a monthly summary of waste generated by the Project to ensure that waste diversion goals are on track with Project requirements:

.1 Submittal of waste summary can coincide with application for progress payment, or similar milestone event as agreed upon between the Owner, and Contractor.

.2 Monthly waste summary shall contain the following information:

.1 The amount in tonnes or m3 and location of material landfilled,

.2 The amount in tonnes or m3 and location of materials diverted from landfill, and

.3 Indication of progress based on total waste generated by the Project with materials diverted from landfill as a percentage.

3.02 SUBCONTRACTOR'S RESPONSIBILITY

.1 Subcontractor's shall cooperate fully with the Contractor to implement the CWM Plan.

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

3.03 SAMPLE CONSTRUCTION WASTE MANAGEMENT FORMS

.1 Sample waste tracking form below can be used by the Contractor to establish their own forms for recording management of construction waste:

SAMPLE WASTE MANAGEMENT FORM

Material Stream	**Diverted Waste by Report Date**	**Total**	**Units**				
	Sept			**Oct**	**Nov**	**Dec**	
Material Streams Contributing to Credit	Plastic	1.25	2.5	10	5	18.75	m^3
	Carpet	2.5	2.5	2.5	0	7.5	m^3
	Paper/Cardboard	5	2.5	2.5	5	15	m^3
	Clean Wood	0	25	0	1.25	26.25	m^3
	Metal	1.25	2.5	5.5	7	16.25	m^3
	Gypsum Board	2.5	2.5	4	5	14	m^3
	Brick/Concrete	10.5	2.5	5.5	8.75	27.25	m^3
	Asphalt Shingles	10	0	0	0	10	m^3
Total Diverted Waste	135	m^3					
	Landfill	10.75	7.5	15	10	43.25	m^3
Material Streams not Contributing to Credit	Screen Fines (ADC)	5	1.25	0	2.5	8.75	m^3
	150 mm Minus (ADC	1.25	1.25	5	5.5	13	m^3
Total Landfill/ADC Waste	65	m^3					
Total Waste	200	m^3					
Percent Diverted	67.5	%					

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 Canadian Construction Documents Committee (CCDC)

.1 CCDC 2, Stipulated Price Contract.

.2 Canadian Environmental Protection Act (CEPA)

.1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations.

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Acceptance of Work Procedures:

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

.1 Notify HWDSB in writing of satisfactory completion of Contractor's inspection and submit verification that corrections have been made.

.2 Request HWDSB and JASON FUNG ARCHITECT INC. inspection.

.2 HWDSB and JASON FUNG ARCHITECT INC. Inspection:

.1 HWDSB, JASON FUNG ARCHITECT INC. and Contractor to inspect Work and identify defects and deficiencies.

.2 Contractor to correct Work as directed.

.3 Completion Tasks: submit written certificates in English that tasks have been performed as follows:

.1 Work: completed and inspected for compliance with Contract Documents.

.2 Defects: corrected and deficiencies completed.

.3 Equipment and systems: tested,[adjusted and balanced and fully operational.

.4 Certificates required by Boiler Inspection Branch, Fire Commissioner, Utility companies: submitted.

.5 Operation of systems: demonstrated to Owner's personnel.

.6 Commissioning of mechanical systems: completed and copies of final Commissioning Report submitted to HWDSB and JASON FUNG ARCHITECT INC.

.7 Work: complete and ready for final inspection.

.4 Final Inspection:

.1 When completion tasks are done, request final inspection of Work by HWDSB and JASON FUNG ARCHITECT INC., and Contractor.

.2 When Work incomplete according to HWDSB and JASON FUNG ARCHITECT INC., complete outstanding items and request re-inspection.

.5 Declaration of Substantial Performance: when HWDSB and JASON FUNG ARCHITECT INC. considers deficiencies and defects corrected and requirements of Contract substantially

performed, make application for Certificate of Substantial Performance.

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

.7 Final Payment:

.1 When HWDSB and JASON FUNG ARCHITECT INC. considers final deficiencies and defects corrected and requirements of Contract met, make application for final payment.

.2 Refer to CCDC 2: when Work deemed incomplete by HWDSB and JASON FUNG ARCHITECT INC., complete outstanding items and request re-inspection.

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

1.04 FINAL CLEANING

.1 Clean in accordance with Section 01 74 00 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

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

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 Canadian Environmental Protection Act (CEPA):

.1 SOR/2008-197, Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-warranty Meeting:

.1 Convene meeting one week before contract completion with Contractor and HWDSB, in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify Project requirements.

.2 Review manufacturer's installation instructions and warranty requirements.

.2 HWDSB to establish communication procedures for:

.1 Notifying construction warranty defects.

.2 Determine priorities for type of defects.

.3 Determine reasonable response time.

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

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

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Two weeks before Substantial Performance of the Work, submit to the HWDSB, two copies of operating and maintenance manuals in English.

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

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

1.05 FORMAT

.1 Organize data as instructional manual.

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

.3 When multiple binders are used correlate data into related consistent groupings.

.1 Identify contents of each binder on spine.

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

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

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

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

.8 Drawings: Provide with reinforced punched binder tab.

.1 Bind in with text; fold larger drawings to size of text pages.

1.06 CONTENTS - PROJECT RECORD DOCUMENTS

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

.1 Date of submission; names.

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

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

.2 For each product or system:

.1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

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

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

.5 Typewritten Text: As required to supplement product data.

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

1.07 AS-BUILT DOCUMENTS AND SAMPLES

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

.1 Contract Drawings.

.2 Specifications.

.3 Addenda.

.4 Change Orders and other modifications to Contract.

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

.6 Site test records.

.7 Inspection certificates.

.8 Manufacturer's certificates.

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

.1 Provide files, racks, and secure storage.

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

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

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

.1 Do not use record documents for construction purposes.

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

1.08 RECORDING INFORMATION ON PROJECT RECORD DOCUMENTS

.1 Record information on set of black line opaque drawings, and in copy of Project Manual, provided by HWDSB.

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

.3 Record information concurrently with construction progress.

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

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

.1 Measured depths of elements of foundation in relation to finish first floor datum.

.2 Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

.3 Measured locations of internal utilities and appurtenances, referenced to visible and accessible features of construction.

.4 Site changes of dimension and detail.

.5 Changes made by change orders.

.6 Details not on original Contract Drawings.

.7 Referenced Standards to related shop drawings and modifications.

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

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

.2 Changes made by Addenda and change orders.

.6 Other Documents: Maintain manufacturer's certifications, inspection certifications, site test records, required by individual specifications Sections.

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

1.09 FINAL SURVEY

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

1.10 EQUIPMENT AND SYSTEMS

.1 For each item of equipment and each system include description of unit or system, and component parts.

.1 Give function, normal operation characteristics and limiting conditions.

.2 Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.

.2 Panel board circuit directories: provide electrical service characteristics, controls, and communications.

.3 Include installed colour coded wiring diagrams.

.4 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences.

.1 Include regulation, control, stopping, shut-down, and emergency instructions.

.2 Include summer, winter, and any special operating instructions.

.5 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

.6 Provide servicing and lubrication schedule, and list of lubricants required.

.7 Include manufacturer's printed operation and maintenance instructions.

.8 Include sequence of operation by controls manufacturer.

.9 Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

.10 Provide installed control diagrams by controls manufacturer.

.11 Provide Contractor's coordination drawings, with installed colour coded piping diagrams.

.12 Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

.13 Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

.14 Include test and balancing reports as specified in Section 01 45 00 - Quality Control.

.15 Additional requirements: As specified in individual specification Sections.

1.11 MATERIALS AND FINISHES

.1 Building products, applied materials, and finishes: Include product data, with catalogue number, size, composition, and colour and texture designations.

.1 Provide information for re-ordering custom manufactured products.

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

.3 Moisture-protection and weather-exposed products: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

.4 Additional requirements: As specified in individual specifications Sections.

1.12 MAINTENANCE MATERIALS

.1 Spare Parts:

.1 Provide spare parts, in quantities specified in individual specification Sections.

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

.3 Deliver to site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to HWDSB.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit before final payment.

.2 Extra Stock Materials:

.1 Provide maintenance and extra materials, in quantities specified in individual specification Sections.

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

.3 Deliver to site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to HWDSB.

.2 Include approved listings in Maintenance Manual.

.5 Obtain receipt for delivered products and submit before to final payment.

.3 Special Tools:

.1 Provide special tools, in quantities specified in individual specification Section.

.2 Provide items with tags identifying their associated function and equipment.

.3 Deliver to site; place and store.

.4 Receive and catalogue items.

.1 Submit inventory listing to HWDSB.

.2 Include approved listings in Maintenance Manual.

1.13 DELIVERY, STORAGE, AND HANDLING

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

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

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

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

.5 Remove and replace damaged products at own expense and for review by HWDSB.

1.14 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 HWDSB approval.

.3 Warranty management plan to include required actions and documents to assure that HWDSB 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 HWDSB for approval before each monthly pay estimate.

.6 Assemble approved information in binder, submit upon acceptance of work and organize binder as follows:

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

.2 List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of

responsible principal.

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

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

.5 Co-execute submittals when required.

.6 Retain warranties and bonds until time specified for submittal.

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

.8 Conduct joint 9 month warranty inspection, measured from time of acceptance, by HWDSB.

.9 Include information contained in warranty management plan as follows:

.1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, Subcontractors, manufacturers, or suppliers involved.

.2 Listing and status of delivery of Certificates of Warranty for extended warranty items, to include HVAC balancing, motors, and commissioned systems such as fire protection, alarm systems, sprinkler systems.

.3 Provide list for each warranted equipment, item, feature of construction or system indicating:

.1 Name of item.

.2 Model and serial numbers.

.3 Location where installed.

.4 Name and phone numbers of manufacturers or suppliers.

.5 Names, addresses and telephone numbers of sources of spare parts.

.6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.

.7 Cross-reference to warranty certificates as applicable.

.8 Starting point and duration of warranty period.

.9 Summary of maintenance procedures required to continue warranty in force.

.10 Cross-Reference to specific pertinent Operation and Maintenance manuals.

.11 Organization, names and phone numbers of persons to call for warranty service.

.12 Typical response time and repair time expected for various warranted equipment.

.4 Contractor's plans for attendance at 9 month post-construction warranty inspections.

.5 Procedure and status of tagging of equipment covered by extended warranties.

.6 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.

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

.11 Written verification to follow oral instructions.

.1 Failure to respond will be cause for the HWDSB to proceed with action against Contractor.

1.15 WARRANTY TAGS

.1 Tag, at time of installation, each warranted item. Provide durable, oil- and water-resistant tag approved by HWDSB.

.2 Attach tags with copper wire and spray with waterproof silicone coating.

.3 Leave date of acceptance until project is accepted for occupancy.

.4 Indicate the following information on tag:

.1 Type of product/material.

.2 Model number.

.3 Serial number.

.4 Contract number.

.5 Warranty period.

.6 Inspector's signature.

.7 Construction Contractor.

2 PRODUCTS

2.01 NOT USED

.1 Not Used.

3 EXECUTION

3.01 NOT USED

.1 Not Used.

END OF SECTION

1 GENERAL

1.01 SUMMARY

.1 Section Includes:

.1 demolition and disposal of select building items

.2 removal and reinstallation of select building items

.3 removal and turning over to the HWDSB, of select building.

.4 repair and restoration work after completion of work of this Section

1.02 RELATED REQUIREMENTS

.1 Section 02 82 00 – Asbestos Abatement

1.03 DEFINITIONS

.1 Hazardous Materials: Products, mixtures, materials, or substances classified as physical hazards or health hazards in accordance with Schedule 2 of the Hazardous Products Act.

1.04 REFERENCE STANDARDS

.1 CSA Group (CSA):

.1 CSA Z783:[12], Deconstruction of Buildings and Their Related Parts

.2 Department of Justice Canada:

.1 Hazardous Products Act, [1985]

1.05 ADMINISTRATIVE REQUIREMENTS

.1 Coordinate work of this Section with:

.1 Section 02 82 00 – Asbestos Abatement

.2 Pre-Demolition Meetings: Conduct site meeting in accordance with Section 01 31 19 – Project Meetings and attended by the HWDSB and related Subcontractors to:

.1 Verify project requirements, including existing construction conditions affected by work of this Section, scope of selective demolition work, demolition sequencing, and protection of in-place conditions.

.2 Review scheduling of utility disruptions that may affect building occupants.

.3 Coordinate with other Subcontractors.

.3 Scheduling:

.1 Maintain project schedule without compromising specified minimum material diversion rates.

.2 Notify the HWDSB of unforeseen delays, in writing.

1.06 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Submit the following action submittals before starting work of this Section:

.1 Schedule of Demolition Activities: in accordance with Section 01 32 16.19 - Construction Progress Schedule - Bar (GANTT) Chart.

.3 Submit the following when requested by the HWDSB:

.1 Qualification statements: Information about companies and personnel indicating their experience and capabilities to perform demolition work; include lists of completed projects with project names and addresses, and names and addresses of consultants for work of similar complexity and extent.

.5 Submit copies of the following, when required by the authority having jurisdiction (AHJ):

.1 reviewed shop drawings;

.2 reviewed demolition procedures.

1.07 QUALITY ASSURANCE

.1 Licensed Professional Qualifications: In accordance with Section 01 43 00 – Quality Assurance.

1.08 SITE CONDITIONS

.1 Hazardous Materials are listed in DSS report. Contractor to review report and account to remediation.

.2 Review the hazardous materials assessment in accordance with Section 00 31 00 – Available Project Information.

.3 Stop work immediately and take preventative measures if material resembling spray- or trowel-applied asbestos or other Hazardous Materials are encountered.

.1 Notify the HWDSB immediately.

.2 Proceed with Work after receipt of written instructions from the HWDSB.

2 PRODUCTS

2.01 MATERIAL OWNERSHIP

.1 Coordinate material ownership with the HWDSB

.1 The Owner will retain ownership of:

.1 items to remain;

.2 items to be re-used;

.3 items to be re-installed;

.4 items to be removed and turned over to the HWDSB

.5 historic items, relics, and similar objects;

.6 cornerstones and their contents;

.7 commemorative plaques and tablets;

.8 antiques;

.9 other items of interest or value to the Owner that may be encountered during demolition.

.2 Take possession of demolished materials and remove from site.

2.02 REPAIR MATERIALS

.1 Use repair materials identical to existing materials.

.1 If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces as closely as possible.

.2 Use materials whose installed performance equals or surpasses that of existing materials.

3 EXECUTION

3.01 EXAMINATION

.1 Review existing conditions and coordinate with indicated requirements to determine extent of demolition required.

.2 Review record documents of existing facility available from the HWDSB.

.3 The HWDSB does not guarantee record documents are accurate, complete, or appropriate.

.4 Inventory and record the condition of items being removed and turned over to HWDSB. Promptly submit a written report to the HWDSB.

.5 When unforeseen structural, mechanical, electrical, or other issues are encountered that interfere with demolition or removal, investigate and measure the nature and extent of the interference.

.6 Promptly submit a written report to the HWDSB.

.7 Perform an engineering review of building conditions to determine whether removing any element might result in structural deficiency, deformation, or unplanned collapse of any portion of the building or structure, or adjacent buildings or structures, during demolition operations.

.8 Verify Hazardous Materials have been abated or remediated before proceeding with work of this Section.

3.02 PREPARATION

.1 Protection of In-Place Conditions:

.1 Use methods, certified by a qualified licensed professional to prevent movement, settlement, or damage to adjacent properties and buildings, landscaping to remain in place. Provide temporary bracing and shoring as required.

.2 Minimize noise, dust, vibration, and inconvenience to occupants in accordance with Section 01 14 00 – Work Restrictions. Provide temporary negative air pressure in demolition areas relative to adjacent occupied areas.

.3 Protect building systems, utilities, equipment, landscaping, and other items to remain.

.4 Provide temporary dust screens, covers, railings, supports, and other protection in accordance with Section 01 56 00 – Temporary Barriers and Enclosures.

.5 Protect interior items exposed to the weather.

.6 Maintain access to egress, walkways, corridors, exits, and other adjacent occupied or partially-occupied facilities, unless approved, in writing, by the AHJ.

.1 Submit copy of written approval from the AHJ.

3.03 [DEMOLITION] [AND] [REMOVAL] REQUIREMENTS

.1 Demolish or remove select building items in accordance with CSA Z783.

3.04 DEMOLITION

.1 Demolish items as indicated on the Drawings.

3.05 REMOVE AND REINSTALL

.1 Remove items indicated on the Drawings.

.2 Examine removed items. HWDSB's acceptance for reinstallation if removed items appear in poor condition.

.3 Temporarily store, protect, and prepare removed items for re-use.

.4 Reinstall removed items as indicated on the Drawings.

3.06 REMOVE AND SALVAGE

.1 Remove items indicated on the Drawings.

.2 Store and protect removed items where acceptable to the HWDSB.

3.07 REPAIRS AND RESTORATION

.1 Promptly repair damage to adjacent construction caused by work of this Section. Patch existing surfaces to make suitable for new materials.

.2 Restore exposed finishes on patched surfaces. Extend restoration to adjoining construction to eliminate evidence of patching and refinishing.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 07 92 00 - Joint Sealants

.2 Section 09 01 90.63 - Interior Re-Painting

1.02 DEFINITIONS

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

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

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

1.03 REFERENCE STANDARDS

.1 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]).

.2 LEED Canada-CI Version 1.0-[2007], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Guide For Commercial Interiors.

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

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

.3 Department of Justice Canada (Jus)

.1 Transportation of Dangerous Goods Act, 1992 (TDG Act) [1992], (c. 34).

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

.4 Green Seal Environmental Standards (GS)

.1 GS-11-[2008, 2nd Edition], Paints and Coatings.

.2 GS-36-[00], Commercial Adhesives.

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

.1 WHMIS Safety Data Sheets (SDS).

.6 National Research Council Canada (NRC)

.1 National Fire Code of Canada [2015] (NFC).

.7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

.1 SCAQMD Rule 1113-[A2007], Architectural Coatings.

.2 SCAQMD Rule 1168-[A2005], Adhesive and Sealant Applications.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

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

.2 Submit two copies of WHMIS Safety Data Sheets (SDS) in accordance with Section 01 35 29.06 - Health and Safety Requirements to HWDSB for each hazardous material required prior to bringing hazardous material on site.

.3 Submit hazardous materials management plan to HWDSB that identifies hazardous materials, usage, location, personal protective equipment requirements, and disposal arrangements.

.4 Hazardous waste classification: identify waste codes applicable to each hazardous waste material based on applicable federal and provincial acts, regulations, and guidelines. Waste profiles, analyses, and classification submitted to contract offices for review and approval.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with with manufacturer's written instructions.

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

.3 Transport hazardous materials and wastes in accordance with Transportation of Dangerous Goods Act, Transportation of Dangerous Goods Regulations, and applicable provincial regulations.

.4 Storage and Handling Requirements:

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

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

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

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

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

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

.5 Transfer of flammable and combustible liquids is prohibited within buildings.

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

.7 Solvents or cleaning agents: non-flammable or have flash point above 38 degrees C.

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

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

.10 Storage requirements for quantities of hazardous materials and wastes in excess of 5 kg for

solids, and 5 litres for liquids:

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

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

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

.4 Segregate incompatible materials and wastes.

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

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

.7 Maintain clear egress from storage area.

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

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

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

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

.12 Report spills or accidents immediately to HWDSB. Submit a written spill report to HWDSB within 24 hours of incident.

2 PRODUCTS

2.01 MATERIALS

.1 Description:

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

.2 Maintain WHMIS Safety Data Sheets (SDS) in proximity to where materials are being used. Communicate this location to personnel who may have contact with hazardous materials.

.3 Sustainability Characteristics:

.1 Adhesives and Sealants in accordance with Section 07 92 00 - Joint Sealants.

.1 Adhesives and Sealants: maximum VOC limit 200 g/L.

.2 Primers, Paints, Coatings in accordance with manufacturer's recommendations for surface conditions and Section 09 91 23 - Interior Painting, and 09 01 90.63 - Interior Re-Painting.

.1 Primer: maximum VOC limit 250 g/L.

.2 Paints: maximum VOC limit 50 g/L.

.3 Coatings: maximum VOC limit 300 g/L.

.4 Spill Response Materials: provide spill response materials which can be used for absorbing/shoveling and containing hazardous materials.

.5 Provide personal protective equipment.

3 EXECUTION

3.01 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

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

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

.3 Waste Management: separate waste materials for reuse and recycling.

.1 Dispose of hazardous waste materials in accordance with applicable federal and provincial acts, regulations, and guidelines.

.2 Recycle hazardous wastes for which there is approved, cost effective recycling process available.

.3 Send hazardous wastes to authorized hazardous waste disposal or treatment facilities.

.4 Burning, diluting, or mixing hazardous wastes for purpose of disposal is prohibited.

.5 Disposal of hazardous materials in waterways, storm or sanitary sewers, or in municipal solid waste landfills is prohibited.

.6 Dispose of hazardous wastes in timely fashion in accordance with applicable provincial regulations.

.7 Minimize generation of hazardous waste to maximum extent practicable. Take necessary precautions to avoid mixing clean and contaminated wastes.

.8 Identify and evaluate recycling and reclamation options as alternatives to land disposal, such as:

.1 Hazardous wastes recycled in manner constituting disposal.

.2 Hazardous waste burned for energy recovery.

.3 Lead-acid battery recycling.

.4 Hazardous wastes with economically recoverable precious metals.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Read this section in conjunction with all other sections so as to conform to Division 1, and the General Requirements of the project.

.2 Inform all sub-trades of the presence of Asbestos Containing Materials identified in the documents.

.3 The Contractor involved directly or indirectly with the removal, handling, management, transportation and disposal of Asbestos Containing Materials and Asbestos Waste in any and all aspects shall take all reasonable precautions, due care and diligence to prevent asbestos from becoming airborne and shall take all reasonable precautions to control and prevent the spread of airborne asbestos in the event of an incident, accidental release or loss of containment. Cost of additional work by the Contractor and/or Consultant to rectify unsatisfactory conditions, shall be charged to the Contractor.

.4 No allowance will be made for any difficulties encountered or any expenses incurred on account of any conditions of the site or any item existing thereon that is visible or known or can be reasonably anticipated.

.5 The Contractor shall be prepared to respond throughout the duration of the project in order to repair, encapsulate remove or otherwise manage additional asbestos as required. The abatement contractor shall provide an emergency contact phone number and be on call to provide emergency services.

.6 The abatement contractor shall control all water migration (including leakage and spillage) from the abatement work area to areas below/adjacent. It is the responsibility of the contractor to protect all items from damage caused by water used in the abatement work area(s). The abatement contractor must immediately mitigate any and all damage to the satisfaction of the owner and Consultant resulting from water used in the abatement work area(s) at their own expense. No allowances shall be made as a result of lost time, resources, materials or equipment.

.7 It is the Contractor’s responsibility to ensure all construction aspects of the project are conducted in accordance with applicable construction safety legislation, regulations and general approved practice. This includes, but is not limited to; all means, methods, techniques, sequences, procedures, safety programs and precautions used.

1.2 DEFINITIONS

.1 Asbestos Containing Material: Materials that contain 0.5 percent or more asbestos by dry weight.

.2 Asbestos Waste: is material that contains asbestos in more than a trivial amount or proportion as defined by Ontario Regulation 347 as amended by Ontario Regulation 558/00 and includes the following:

.1 Solid or liquid waste that results from the removal of asbestos-containing construction or insulation materials and contains asbestos;

.2 Commercial waste and/or domestic waste that contains asbestos;

.3 Non-hazardous solid industrial waste that contains asbestos; and

.4 Materials determined or deemed contaminated with asbestos.

.3 Authorized Visitors: The Consultant or their representative, Architect, Owner's representatives, and persons representing regulatory agencies.

.4 Contractor: Contractors or Sub-Contractor performing work included in this specification.

.5 Consultant: Owner's Representative providing inspection and air monitoring.

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PART 2 – SCOPE OF WORK

2.1 SUMMARY OF MATERIALS

.1 Refer to the following documents regarding Designated Substances within the work areas. The survey and documentation of Designated Substances is required by Section 30 of the Occupational Health and Safety Act and shall be read in conjunction with these specifications.

.1 "*Westview Elementary School Window and Door Replacement, Designated Substance Audit Report – 60 Rolston Drive, Hamilton, ON*" dated February 27, 2024 prepared by MTE Consultants Inc.

.2 Removal and/or disturbance of asbestos-containing materials shall be performed in accordance with Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations.

.3 Removal and/or disturbance of silica-containing materials shall be performed in accordance with the Ministry of Labour's Guideline Silica on Construction Projects.

.4 PCB-Containing exterior gray sealant shall be removed and appropriately stored and disposed of by the Contractor in accordance with SOR 2008-273 - PCB Regulations.

.2 ACM may be present in concealed locations and become apparent during construction, renovation, alteration, or maintenance activities. Should any suspect ACM be discovered during the course of regular construction, renovation, alteration, or maintenance activities, work should cease and the materials should not be disturbed. Suspect ACM must be treated as asbestos-containing or sampled and proven to not contain asbestos. Any activities that require disturbance of ACM must be performed in accordance with Ontario Regulation 278/05. It is the responsibility of the constructor to provide supervision and training and undertake due care and diligence in situations where such discoveries can and would occur.

.3 Upon discovery of suspect or known ACM not identified or referred to in Section 2.0 or the reports referenced, the constructor shall immediately notify, orally and in writing; an inspector at the office of the Ministry of Labour nearest the workplace, the

owner/representative, the Contractor and the joint health and safety committee or the health and safety representative, if any, for the workplace. The written notice shall include the following:

.1 The name and address of the person giving the notice;

.2 The name and address of the owner of the place where the work will be carried out;

.3 The municipal address or other description of the place where the work will be carried out sufficient to permit the inspector to locate the place, including the location with respect to the nearest public highway;

.4 A description of the work that will be carried out;

.5 The starting date of the work that will be carried out; and

.6 The name and address of the supervisor in charge of the work.

.4 No work that is likely to involve handling, dealing with or disturbing or removing the discovered materials shall be done unless it has been determined whether the material is asbestos-containing; or, the work is performed in accordance to Ontario Regulation 278/05 as though the materials were asbestos-containing materials and, in the case of sprayed-on friable material, as though it contained a type of asbestos other than Chrysotile.

2.2 SUMMARY OF MATERIALS

.1 Where required to complete the scope of the proposed renovations, disturbance of Asbestos-Containing Materials shall be performed as follows, in accordance with Ontario Regulation 278/05:

Location	ACM	Asbestos Operation	Notes
Ceiling Tiles Throughout	Potential Asbestos-Containing Debris from Spray-on Fireproofing May be Present and Lying on the Surface of the Tile	Type 2	Ceiling tiles may be cleaned, stored on-Site and re-installed (if necessary)
Ceiling Cavities Throughout	Spray on Fireproofing	Type 2	Removal of less than 1 m^2 of material
		Type 3	Removal of greater than 1 m^2 of material

Location	ACM	Asbestos Operation	Notes
Ceiling in Classroom 123	Drywall	Type 1	Removal of less than 1 m^2 of material
		Type 2	Removal of greater than 1 m^2 of material
Classroom 123	Black Mastic Associated with 12” x 12” Vinyl Floor Tile – Gray Fleck Pattern	Type 1	Removal using non-powered hand tools in conjunction with dust suppression. Floor Tiles with Mastic adhered must be treated as asbestos-containing waste
Interior Side of Exterior Door in Classroom 123	Black Sealant	Type 1	Removal using non-powered hand tools in conjunction with dust suppression.

2.3 SCHEDULING

.1 The Contractor shall schedule and perform work in accordance with the Contract Time established in the agreement.

2.4 INSPECTION

.1 From project set-up to completion of clean-up, the Asbestos Abatement Consultant will be present on both the inside and outside of the work area.

.2 Inspections will be conducted to confirm the Contractor’s compliance. Failure to comply with the specified requirements may result in a stoppage of work at no additional cost to the Owner.

.3 Promptly notify the Consultant of any ACM or potential ACM discovered during the work and not apparent in the audit, specifications or site meeting(s). DO NOT disturb such material until given direction by the Consultant. Assume such material to contain asbestos of a type other than Chrysotile until proven otherwise. Failure to notify the Consultant of ACM prior to removal will result in the dispute of payment of fees for any extra work performed.

.4 The following inspections will be conducted at the Owner’s cost. Provide Consultant with minimum of 24 Hours verbal notice:

.1 Pre Start Inspection: conducted after completion of work area set-up and prior to start of contaminated work.

.2 Contaminated Work Inspections: inspections and routine monitoring of the

abatement will be conducted for the duration of the work.

.3 Final Inspection: conducted after removal of all ACM, and application of lockdown agent to confirm cleanliness. Additional labour or materials expended by the Asbestos Abatement Contractor to provide satisfactory performance to the level specified shall be at no additional cost.

.4 Final Clearance Air Testing: All Type 3 asbestos removals completed indoors are subject to air clearance testing in accordance with Ontario Regulation 278/05 by the Consultant prior to the shut-down of Negative Air Units and/or tear-down of the enclosure in whole or in part. Clearance air testing shall be conducted in accordance with sample methods and procedures prescribed in Ontario Regulation 278/05 Section 17 and Table 3.

2.5 SUBMITTALS

.1 Submit to the Consultant upon request:

.1 AAW and AAS certification and relevant training for all workers/supervisors on-site and involved in the project.

.2 Names, credentials and contact information of Site superintendent and shift supervisors.

.3 All necessary permits, certificates, and documents for all aspects of the work to be completed.

.4 Ministry of Labour Notice of Project if applicable.

.5 Certificate of Approval for transportation of asbestos waste.

.6 Negative air unit performance leak tests.

.7 HEPA/P100 filtered vacuum performance leak tests.

.8 Any and all proposed changes, alterations, deviations intended to be made in scope, procedures and/or measures from these specifications or associated regulations, guidelines and standards.

.2 The contractor shall have all asbestos waste transported under a current and valid Certificate of Approval or Provisional Certificate of Approval that specifically authorizes the transportation of asbestos waste in bulk. A copy of the Certificate of Approval will be maintained on-site and within the transport vehicle(s) and will be provided to the Consultant upon request.

2.6 PERMITS AND REGULATIONS

.1 Comply with all federal, provincial and local requirements, Regulations and Acts as well as client/owner corporate policies and procedures pertaining to asbestos and health and safety, provided that in any case of conflict among these requirements or with these specifications the more stringent requirements shall apply.

.2 Comply will all aspects of the Occupational Health and Safety Act Revised Statues of Ontario, 2005.

.3 Comply with Ontario Regulation 278/05 “Asbestos on Construction Projects and in Buildings and Repair Operations”, made under the Occupational Health and Safety Act.

.4 Comply with “Handling, Transportation and Disposal of Asbestos Waste’ in accordance with Ontario Regulation 347 as amended by Ontario Regulation 558/00, under the Environmental Protection Act (General-Waste Management), June 1992.

.5 Before varying a measure or procedure described in Ontario Regulation 278/05, or these specifications, the contractor/constructor must ensure that the varied measure(s) and/or procedure(s), affords protection for the health and safety of workers and building occupants that is at least equal to the protection that would be provided by complying with Ontario Regulation 278/05. Written notice of the varied measure(s) and/or procedure(s) shall be given in advance to the joint health and safety committee and safety representative, if any, for the workplace. Such notice shall also be provided to the Consultant.

2.7 INSTRUCTION AND TRAINING

.1 It shall be the responsibility of the Constructor to inform all workers involved in this project of the hazards in regard to the work to be performed and ensure appropriate training has been provided to all workers.

.2 Every worker shall be properly trained in accordance with Section 19 of Ontario Regulation 278/05 in the removal/management of asbestos as a Type 1, Type 2 and Type 3 Operation and have had instruction and training in:

.1 Asbestos awareness;

.2 The hazards of asbestos exposure;

.3 Personal hygiene and work practices;

.4 The use, cleaning, maintenance, selection and disposal of respirators and protective clothing; and

.5 The measures and procedures prescribed by Ontario Regulation 278/05.

.3 Instruction and training related to personal protective equipment and hygiene shall include but shall not necessarily be limited to:

.1 Limitations of the equipment;

.2 Inspection and maintenance of the equipment;

.3 Fitting of the equipment; and

.4 Disinfecting and decontamination of the equipment.

.4 The abatement contractor shall ensure that every worker/supervisor involved in a Type 3 operation meets the training and certification requirements of Section 20 of Ontario Regulation 278/05.

2.8 WORKER PROTECTION

.1 All personal protective equipment shall be used and maintained in accordance to the

manufactures specifications and/or federal, provincial, local regulations and Acts and any corporate policies and procedures.

.2 All Personal protective equipment shall be of a nature that can be readily and effectively decontaminated or shall be of a disposable type.

.3 Damaged, deteriorated or defective personal protective equipment shall be repaired or replaced immediately and the worker shall not continue with their duties until such damages, deterioration or defects have been corrected.

.4 All personal protective equipment shall be durable enough and otherwise suitable to withstand the nature of the work being performed and the environmental conditions present within the work area(s).

.5 The contractor shall provide all workers with personally issued respirators suitable for protection against asbestos and acceptable to the Ministry of Labour.

.6 It shall be the responsibility of the contractor/constructor to ensure that all procedures for the use of respiratory equipment in accordance with Ontario Regulation 278/05 and manufacturers requirements are complied with. This shall include but shall not necessarily be limited to:

.1 The worker being physically able to perform the required duties while wearing the respirator;

.2 Respirators must be fit checked by qualitative or quantitative fit testing. Instruction must be provided as defined by the Occupational Health and safety Act;

.3 Air purifying respirators will be equipped with Ministry of Labour and NIOSH approved N 100, P 100, R 100 or HEPA hard exterior cassette style filters and shall be fitted so that an effective seal exists between the respirator and the workers face;

.4 Supplied air respirators will have supply air meet the Canadian Standards Association (CSA) standard Z180.1-00, Compressed Breathing Air and Systems (March 2000);

.5 Cleaning and disinfecting of respirator(s) after each use or more often if needed;

.6 Inspection of respirator(s) and/or respiratory equipment before each use;

.7 The proper storage in a clean, dry and sanitary location when respirator(s) are not in use; and

.8 The development of written procedures regarding selection, use and care of respirators.

.7 Protective Clothing: The contractor shall provide every worker who enters the work area with disposable coveralls and gloves which:

.1 Shall be made of a material that does not readily retain nor permit the penetration of asbestos fibres;

.2 Shall consist of head covering and full body covering that fits snugly at the ankles,

wrists and neck, in order to prevent asbestos fibres from reaching the garment and skin under the protective clothing;

.3 Shall include suitable footwear; and

.4 Shall be repaired or replaced if torn or damaged.

.8 The contractor shall provide worker(s) with Canadian Standards Association approved head, hearing and foot protection for the work being performed and as required by applicable construction safety regulations.

2.9 AUTHORIZED VISITOR PROTECTION

.1 The contractor shall provide all prescribed personal protective equipment to authorized visitors to the work area(s).

.2 Ensure authorized visitors have received required training prior to entry to the work areas.

.3 Instruct authorized visitors in all relevant procedures to be followed while in and around the work area(s).

PART 3 - APPROVED PRODUCTS

3.1 MATERIALS AND EQUIPMENT

.1 Amended Water: Water with a surfactant agent added to reduce water tension for thorough wetting of fibres.

.2 Decontamination Shower: For the purpose of worker decontamination, a portable self-contained shower equipped with the following shall be utilized:

.1 Hot and cold water connections;

.2 Interior hot and cold fixtures that can be controlled by the person using the shower; or provide a constant water temperature of not less the 40 Celsius but not greater 50 Celsius;

.3 A containment basin of sufficient capacity to collect and contain the quantity of water required for at least one worker to properly decontaminate; and

.4 Shall be supplied with soap and clean towels.

.3 Drop Sheets: Fire retardant Polyethylene: 0.15mm (6mil) minimum thickness or Fire retardant Fibre Reinforced (FR) polyethylene: 0.15mm (6mil) minimum thickness. New Materials Only.

.4 Exhausted Ducting: For use with Negative Air Unit(s) shall be flexible reinforced heavy duty type duct and be free of tears, punctures and damage and be otherwise suitable for the conditions of the work area(s). The cross sectional area of the ducting shall be maintained during the operation of the Negative Air Unit(s). And reasonable care shall be taken to ensure the ducting does not become damaged.

.5 Micronic Water Filter: Shall be used to filter contaminated water that is to be discharged to local sanitary sewers. Contaminated water includes but is not necessarily limited to wash down water and decontamination shower water. The filter shall be equipped with a secondary 5 micrometer filter. As an alternative to filtration, contaminated water may be collected in appropriate waste containers for off-site disposal.

.6 Negative Air Units: Shall be equipped with HEPA/P100 filters and shall have performance leak testing to verify efficiency of filters. Copies of filter tests shall be provided to the consultant upon request.

.7 Power Tools: Used in the cutting, grinding, drilling, abrading, sanding, vibrating or removal of Asbestos Containing Material, as a Type 2 Operation, shall be equipped with an effective dust collection device with a HEPA/P100 filtration system capable of capturing all debris and dust generated by the tool. All tools and assemblies of dust collection and filtration equipment will be subject to approval and testing by the Consultant as seen fit prior to use.

.8 Pressure Differential Measuring Device: Shall be capable of measuring pressure differential of 0.02 inches of water column and shall otherwise measure pressure differential in an appropriate range and interval. The device shall be dedicated to the site/work area, properly calibrated, installed and maintained throughout the duration of work to measure pressure differential between the enclosed removal area and the occupied area and shall be acceptable to the consultant. Daily records shall be kept by the contractor, on site, and made available to the consultant.

.9 Sealant: A suitable water based post-removal sealer appropriate for the lock-down and sealing of asbestos fibres to polyethylene sheeting and cleaned substrate.

.10 Sprayer(s): Shall be capable of delivering low velocity mist pattern spray of Amended water or sealant. Sprayers may be hand held reservoir type or powered airless units.

.11 Surfactant: A commercial or industrial agent that when added to potable water reduces surface tension.

.12 Tape: Shall be able to create and maintain a suitable seal on polyethylene and other materials within the work area under both wet and dry conditions and ambient temperatures for the duration of the work being performed and shall otherwise be suitable for the work being performed.

.13 Waste Containers: Waste shall be contained in two overlying dust tight containers impervious to asbestos fibres. The outer container shall be a minimum of 0.15mm (6mil.) thick sealable polyethylene waste bag.

.1 Should the waste material include sharp objects/materials, the inner container shall be a sealable metal, cardboard, fibre or plastic type suitable to resist puncturing of the containers;

.2 Containers shall be cleaned with a damp cloth or vacuum equipped with a HEPA filter immediately before being removed from the work area;

.3 Outer waste containers shall have a pre-printed cautionary asbestos warning identifying it as asbestos waste in both official languages clearly visible and legible in a colour which contrasts with the background on which it is printed; and,

.4 Be otherwise suited for the waste being contained.

.14 Vacuums: Shall be equipped with HEPA/P100 filters and shall have performance leak testing to verify efficiency of filters. Copies of filter tests shall be provided to the consultant upon request.

3.2 SIGNAGE AND PLACARDS

.1 Before beginning work, post a sufficient number of signs at each entrance/exit to the work area(s) warning of asbestos hazards and restricting access to authorized persons wearing personal protective equipment.

.2 On both sides of all containers and vehicles used in the transport of asbestos waste in large easily legible letters of a minimum of ten centimetres (10cm) in height which contrast in colour with the background of the container or vehicle the following words shall be clearly displayed:

.1 CAUTION: CONTAINED ASBESTOS FIBRES; Avoid Creating Dust and Spillage; and,

.2 Asbestos May be Harmful to Your Health; Wear Approved Protective Equipment.

PART 4 - EXECUTION

4.1 GENERAL REQUIREMENTS – ALL PROCEDURES

.1 Before beginning work, post at each entrance/exit to the work area(s) a sufficient number of signs warning of asbestos hazards and restricting access to authorized persons wearing personal protective equipment.

.2 Eating, drinking, chewing or smoking shall not be permitted in the work area.

.3 Where wet removals are to take place de-energize and disable with proper lock-out tag-out procedures electrical systems.

.4 Temporary electrical distribution systems equipped with Ground Fault Circuit Interrupters (GFCI) shall be supplied and used by the Contractor during wet removals.

.5 Remove all items from the work area(s). If items are affixed or otherwise cannot be removed from the work area(s), ensure that they are pre-cleaned using a HEPA/P100 filtered vacuum or damp wiping and completely covered and sealed with polyethylene sheeting and otherwise adequately protected.

.6 Before commencing with work, disable and seal all ventilation to and from the work area and ensure ventilation remains disabled throughout the duration of activities. Seal any and all openings within the work area(s).

.7 Removal of Asbestos Containing Materials shall commence only after set-up is complete.

.8 Frequently and at regular intervals during the Work and immediately upon completion of the work clean up and place all asbestos dust, debris and waste in approved waste containers.

.9 Prevent the spread of dust from the Work Area.

.10 At completion of Work or at the end of the work day, remove from work area(s) all asbestos waste and in accordance with requirements of Ontario Regulations and these specifications dispose of asbestos waste off-site.

4.2 EXECUTION OF TYPE 1 OPERATION

.1 Set-Up

.1 Ensure adequate signage is posted restricting access to the work area to authorized personnel.

.2 Prevent the spread of dust from the work area using measures appropriate to the work to be done. Use single layer rip proof polyethylene drop sheets. In areas with carpeted or textured floors which cannot be readily cleaned use double layer rip proof polyethylene over flooring in work area(s).

.3 Provide facilities for washing hands and face.

.4 Allow for inspection by the Consultant to confirm that set-up is sufficient prior to the start of work.

.2 Asbestos Removal

.1 If a worker requests, the contractor shall supply a respirator in accordance with Ontario Regulation 278/05 Table 2 requirements, suitable for protection against asbestos and protective coveralls and the worker shall wear the respirator and coveralls.

.2 Perform removal of ACM in a manner to reduce dust creation to lowest level practicable by:

- Dust and waste shall not be permitted to fall freely from one work level to another
- Use of hand tools only for the removal of ACM
- Careful removal of ACM
- Continual wetting of Asbestos Containing Materials throughout the work
- Placing removed asbestos waste directly into approved waste containers

.3 All workers shall proceed to washing facilities and wash hands and face before leaving the work area.

.3 Clean-Up

.1 After completion of the removal; perform final thorough cleanup of polyethylene, barriers, drop sheets, tools, equipment, items, work area(s) and adjacent areas using HEPA/P100 filtered vacuum or damp wiping methods. Ensuring work area(s) and all items within the work area(s) are clean of visible asbestos dust, debris and waste. Place and seal asbestos dust debris and waste in approved waste containers.

.2 Allow for inspection by Consultant to determine abatement is complete and an acceptable level of cleanliness prior to application of sealant.

.3 Wet and fold polyethylene drop sheets and barriers in a manner which contains asbestos dust, debris and waste, place and seal in approved waste containers.

.4 If Personal Protective Equipment was requested and used by the worker prior to leaving the work area(s) clean all asbestos dust, debris and waste from clothing and personal protective equipment (PPE). Remove and place disposable PPE in approved waste container.

.5 Immediately before their removal from the work area, clean each filled waste container using HEPA/P100 filtered vacuum and place and seal in a secondary clean waste container.

4.3 EXECUTION OF TYPE 2 OPERATION

.1 Set-Up

.1 Construct an enclosure using polyethylene sheeting that extends from floor to ceiling and encompasses the entire work area were asbestos containing materials will be removed or encapsulated. The enclosure shall include the following:

- Double flap weighted air lock doors at all entrances, exits and doorways of the enclosure and rooms within the enclosure;
- Transparent windows for inspection purposes from outside the enclosure area;
- Sealed edges of the entire enclosure using tape or other suitable methods; and
- Ensure all edges of enclosure are securely fixed.

.2 Construct a decontamination facility as close as practicable to the work area which shall include the following:

- A room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment; and,
- A room suitable for changing into street clothes and for storing clean clothing and equipment.

.3 Arrange configuration of the above-mentioned rooms so that (a) person(s) entering/exiting the work area must pass through each room in the correct order.

.4 Allow for inspection by the Consultant to confirm that set-up is sufficient prior to the start of work.

.2 Asbestos Removal

.1 Workers entering the work area shall don all appropriate personal protective equipment including coveralls and respiratory protection prior to entering the work area.

.2 Before commencing with work and at the beginning and end of each work shift and at a minimum of at least once per day the enclosure shall be inspected for any defects of deficiencies.

.3 Any defects or deficiencies observed shall be repaired forthwith and no work other than such repairs shall be conducted until repair activities are completed

.4 Other than loose material which is pulverized, crumbled and or powdered and shall be removed by HEPA/P100 filtered vacuum, Asbestos Containing Materials to be removed or disturbed shall be thoroughly wetted with Amended Water before and during work unless wetting creates a hazard or causes damage.

.5 Perform removal of ACM in a manner to reduce dust creation to lowest level practicable by:

- Dust and waste shall not be permitted to fall freely from one work level to another;
- Use of hand tools only for the removal of ACM;
- Careful removal of ACM;
- Continual wetting of Asbestos Containing Materials throughout the work; and
- Placing removed asbestos waste directly into approved waste containers.

.6 All workers shall proceed to the washing facilities while wearing respirator and shall wash hands and face before leaving the work area.

.3 Clean-Up

.1 After completion of the removal; perform final thorough cleanup of polyethylene, barriers, tools, equipment, items, work area(s) and adjacent areas using HEPA/P100 filtered vacuum or damp wiping methods. Ensuring work area(s) and all items within the work area(s) are clean of visible asbestos dust, debris and waste. Place and seal all asbestos dust debris and waste in approved waste containers.

.2 Allow for inspection by Consultant to determine abatement is complete and an acceptable level of cleanliness prior to application of sealant.

.3 Apply sealant to all vertical and horizontal surfaces, enclosures, drop sheets and items within the enclosure. Allow sufficient time for sealant to dry.

.4 Wet and fold polyethylene and barriers in a manner which contains asbestos dust, debris and waste, place and seal in approved waste containers.

.5 Prior to leaving the work area(s) workers shall clean all asbestos dust, debris and waste from Personal Protective Clothing Using HEPA/P100 filtered vacuum or damp wipe methods prior to removing the clothing. Remove and place disposable Personal Protective Clothing in approved waste containers.

.6 Immediately before their removal from the work area, clean each filled waste container using HEPA/P100 filtered vacuum and place and seal in a secondary clean waste container.

4.4 EXECUTION OF TYPE 3 OPERATION

.1 Set-Up

.1 Construct an enclosure using polyethylene sheeting that extends from floor to ceiling and encompasses the entire work area were asbestos containing materials will be removed or encapsulated. The enclosure shall include the following:

- Double flap weighted air lock doors at all entrances, exits and doorways of the enclosure and rooms within the enclosure;
- Transparent windows for inspection purposes from outside the enclosure area;
- Sealed edges of the entire enclosure using tape or other suitable methods; and
- Ensure all edges of enclosure are securely fixed.

.2 Construct a decontamination facility as close as practicable to the work area which shall include the following:

- A room suitable for changing into protective clothing and for storing contaminated protective clothing and equipment;
- A decontamination shower; and,
- A room suitable for changing into street clothes and for storing clean clothing and equipment.

.3 Arrange configuration of the above-mentioned rooms so that (a) person(s) entering/exiting the work area must pass through each room in the correct order.

.4 The spread of dust from the work area shall also be prevented by:

- Installing a ventilation system equipped with HEPA filtered exhaust to create and maintain a negative air pressure of 0.02 inches of water within the enclosed area, relative to the area outside the enclosed area;
- Ensuring that replacement air is taken from outside the enclosed area and is free from contamination with any hazardous dust, vapour, smoke, fume, mist or gas; and,
- At regular intervals, using a device to measure and record the difference in air pressure between the enclosed area and the area outside it.

.5 Allow for inspection by the Consultant to confirm that set-up is sufficient prior to the start of work.

.2 Asbestos Removal

.1 Workers entering the work area shall don all appropriate personal protective equipment including coveralls and respiratory protection prior to entering the work area.

.2 Before commencing with work and at the beginning and end of each work shift and at a minimum of at least once per day the enclosure shall be inspected for any defects of deficiencies.

.3 Any defects or deficiencies observed shall be repaired forthwith and no work other than such repairs shall be conducted until repair activities are completed

.4 Other than loose material which is pulverized, crumbled and or powdered and shall be removed by HEPA/P100 filtered vacuum, Asbestos Containing Materials to be removed or disturbed shall be thoroughly wetted with Amended Water before and during work unless wetting creates a hazard or causes damage.

.5 Perform removal of ACM in a manner to reduce dust creation to lowest level

practicable by:

- Dust and waste shall not be permitted to fall freely from one work level to another;
- Use of hand tools only for the removal of ACM;
- Careful removal of ACM;
- Continual wetting of Asbestos Containing Materials throughout the work; and
- Placing removed asbestos waste directly into approved waste containers.

.6 All workers shall proceed to the decontamination facilities before leaving the work area. Each worker shall:

- Clean all dust and debris from Personal Protective Equipment (PPE) using HEPA/P100 filtered vacuum or damp wipe methods;
- Proceed to first decontamination room and remove and place disposable PPE, except respirator, in approved waste containers;
- Still wearing the respirator, proceed to the decontamination shower. Thoroughly wash exposed skin and hair with soap and water until clean;
- Thoroughly clean outside of respirator with soap and water;
- Remove the respirator and wash face with soap and water; and,
- After showering, proceed to clean change room, dry-off and change into street clothes, or clean coveralls before eating, smoking, drinking or otherwise leaving work area(s).

.3 Clean-Up

.1 After completion of the removal; perform final thorough cleanup of polyethylene, barriers, tools, equipment, items, work area(s) and adjacent areas using HEPA/P100 filtered vacuum or damp wiping methods. Ensuring work area(s) and all items within the work area(s) are free of asbestos dust, debris and waste. Place and seal all asbestos dust debris and waste in approved waste containers.

.2 Allow for inspection by Consultant to determine abatement is complete and an acceptable level of cleanliness prior to application of sealant.

.3 Apply sealant to all vertical and horizontal surfaces, enclosures, drop sheets and items within the enclosure. Allow sufficient time for sealant to dry.

.4 Prior to leaving the work area(s), workers shall clean all asbestos dust, debris and waste from Personal Protective Clothing using HEPA/P100 filtered vacuum or damp wipe methods prior to removing the clothing. Remove and place disposable Personal Protective Clothing in approved waste containers.

.5 Immediately before their removal from the work area, clean each filled waste container using HEPA/P100 filtered vacuum and place and seal in a secondary clean waste container.

.6 Allow for Final Clearance Air Testing prior to shut-down of Negative Air Units and/or tear-down of the enclosure in whole or in part.

.7 Following confirmation by the Consultant that the work area(s) can be dismantled, wet and fold polyethylene and barriers in a manner which contains asbestos dust,

debris and waste and place and seal in approved waste containers. Polyethylene sheeting, drop sheets and similar materials used for barriers shall not be reused.

END

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 DEFINITIONS

.1 Environmental Product Declaration (EPD): Submit an Industry-wide EPD for each metal product outlined in the specification. Provide EPD with at least a cradle to gate scope, identifying the following impact categories (minimum):

- .1 Global Warming Potential (GWP): Submit GWP information in the form of kgCO 2 eq.
- .2 Ozone Depletion Potential (ODP): Submit ODP information in the form of kgCFC-11 eq.
- .3 Acidification Potential (AP): Submit AP information in the form of kgSO 2 eq.
- .4 Eutrophication Potential (EP): Submit EP information in the form of kgN eq.
- .5 Smog Formation Potential (SFP): Submit SFP information in the form of kgO 3 eq. Also referred to as Photochemical ozone creation potential (POCP).

1.03 REFERENCE STANDARDS

.1 ASTM International (ASTM):

- .1 ASTM C834-[17], Standard Specification for Latex Sealants
- .2 ASTM C919-[19], Standard Practice for Use of Sealants in Acoustical Applications
- .3 ASTM C920-[18], Standard Specification for Elastomeric Joint Sealants
- .4 ASTM C1193-[16], Standard Guide for Use of Joint Sealants
- .5 ASTM C1330-[18], Standard Specification for Cylindrical Sealant Backing for Use with Cold Liquid-Applied Sealants
- .6 ASTM C1481-[12], Standard Guide for Use of Joint Sealants with Exterior Insulation and Finish Systems (EIFS)
- .7 ASTM D1056–[20], Standard Specification for Flexible Cellular Materials-Sponge or Expanded Rubber
- .8 ASTM D2240-[15e1], Standard Test Methods for Rubber Property, Durometer Hardness
- .9 ASTM D2628-[91], Standard Specification for Preformed Polychloroprene Elastomeric Joint Seals for Concrete Pavements

.2 Canadian General Standards Board (CGSB) 1330:

- .1 CAN/CGSB-19.24-[M90], Multi-component, Chemical Curing Sealing Compound

.3 Department of Justice Canada (Jus):

- .1 Canadian Environmental Protection Act, 1999 (2018) (CEPA)

.4 General Services Administration (GSA) - Federal Specifications (FS):

- .1 FS-SS-S-200-[E(2)1993], Sealants, Joint, Two-Component, Jet-Blast-Resistant, Cold Applied, for Portland Cement Concrete Pavement

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

- .1 Safety Data Sheets (SDS)
- .2 Sealant, Waterproofing, and Restoration Institute (SWRI): Sealants: The Professionals' Guide 2013

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards:

.1 SCAQMD Rule 1168-[A2017], Adhesives and Sealants Applications

.7 Transport Canada (TC):

.1 Transportation of Dangerous Goods Act, 1992 (2019 amended.) (TDGA)

.8 ULC Standards/ UL Canada (ULC):

.1 CAN/ULC 115-[2018], Standard Method of Fire Tests of Firestop Systems

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's product data for each type of primer,backer rod, and sealants and include product characteristics, performance criteria, available colours, compatibility warnings, compliance standards and limitations.

.2 Manufacturer's product to describe:

.3 Submit one electronic copy of WHMIS SDS.

.3 Samples:

.1 Submit two samples of each type of joint sealant material and colour.

.2 Submit two cured samples of exposed sealants of each colour to match adjacent material.

.4 Certificates: When requested by HWDSB, submit manufacturer's product certificates indicating proposed sealant is appropriate for each application on this Project.

.5 Manufacturer's Instructions:

.1 Submit instructions for each type of product.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Submit maintenance data for incorporation into manual.

1.06 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturer: Obtain each type of joint sealant from a single manufacturer.

.2 Minimum three years successful experience in Work of similar size and complexity.

.2 Compatibility: Ensure sealants are compatible with adjacent materials and are approved by manufacture for use with adjacent materials.

.3 Mock-Ups:

.1 Construct mock up in accordance with Section 01 43 00 - Quality Assurance.

.2 Before performing sealant work do sample applications of each type of sealant for review.

.3 Site locations for sample applications shall be designated by HWDSB.

.4 Construct joint sealant mock-ups in assemblies of other Sections with joint sealants, which are referenced in this Section.

.4 Comply with requirements of WHMIS regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to Health Canada.

1.07 DELIVERY, STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging, with manufacturer's label.

.2 Storage and Handling Requirements:

.1 Store materials in a ventilated dry indoor location and in accordance with manufacturer's recommendations.

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

.3 Do not dispose of unused sealant material into sewer system, streams, lakes, onto ground or in other location where it will pose health or environmental hazard.

.4 Divert unused joint sealing material from landfill to official hazardous material collections site approved by HWDSB.

1.08 AMBIENT CONDITIONS

.1 Proceed with installation of joint sealants only when:

.1 Ambient and substrate temperature conditions are within limits permitted by joint sealant manufacturer or are above 4.4 degrees C.

.2 Joint substrates are dry.

.3 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.2 HWDSB will arrange for ventilation system to be operated on maximum outdoor air and exhaust during installation of sealants. Ventilate area of work as directed by HWDSB by use of approved portable supply and exhaust fans.

1.09 WARRANTY

.1 Manufacturer's warranty: Provide manufacturer's standard warranty documentation.

.2 Warrant that sealant work will not leak, crack, crumble, melt, shrink, run, lose adhesion or stain adjacent surfaces in accordance with General Conditions, except for five years.

.3 Installer's Warranty: Provide an installation warranty, installer agrees to repair or replace joint sealants that do not comply with requirements of this Section for two years from Substantial Performance.

2 PRODUCTS

2.01 SUSTAINABILITY CHARACTERISTICS

.1 When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.2 VOC emissions limits shall be as follows:

.1 Sealant Primers:

.1 for non-porous surfaces: 250 g/L

.2 for porous surfaces: 775 g/L

.3 for modified bituminous membranes: 500 g/L

.4 for marine deck: 760 g/L

.5 for other conditions: 420 g/L

.2 Sealants:

.1 architectural: 250 g/L

.2 marine deck: 760 g/L

.3 non-membrane roof: 300 g/L

.4 roadway: 250 g/L

.5 single-ply roof membrane: 450 g/L

.6 other conditions: 420 g/L

2.02 PERFORMANCE REQUIREMENTS

.1 Each sealant system shall meet the following requirements for warranty period:

.1 Waterproof, flexible, and compatible with substrate under applicable service conditions.

.2 Provide a weather-tight seal that does not allow moisture penetration.

.3 Shall not de-bond, crack, or craze.

.4 Shall not leak.

2.03 SEALANT MATERIALS

.1 In air handling units and supply air system, use sealants without strong odours, without toxic chemicals, and are mould-resistant. When low toxicity sealants are not possible, confine usage to areas which off gas to exterior, are contained behind air barriers, or are applied several months before occupancy to maximize off gas time.

.2 Provide primers in accordance with manufacturer recommendation.

2.04 SEALANT MATERIAL DESIGNATIONS

.1 Type S-1: Acrylic Latex One Part, Shore A Hardness 20,

.2 Type S-2: Silicone Sealant; mould and mildew resistant.

.1 To [ASTM C920] [CAN/CGSB-19.13]; type S; grade NS; class 50; use NT, G, and A.

.2 To [ASTM C920] [CAN/CGSB-19.13]; type S; grade NS; class 25; use NT, G, and A.

.3 Type S-3: Silicone Sealant; general construction and air-seal sealant.

.1 To [ASTM C920]: type S; grade NS; class 25; use NT, M, G, A, O.

.4 Type S-4: Silicone Sealant; structural glazing.

.1 To [ASTM C920] [CAN/CGSB-19.13]: type S; grade NS; class 25; use NT, A, G, O.

.5 Type S-5: Acoustical Sealant; interior, non-skimming, non-hardening, simple component synthetic

rubber sealant, to ASTM C919.

.6 Type S-6: Multi-component polyurethane sealant; chemical curing, exterior wall sealant.

.1 To [ASTM C920] [CAN/CGSB-19.24]: type M; grade NS; class 50; use T, NT, M, A, O.

.7 Type S-7: One-component polyurethane sealant; non-sag, for general construction.

.1 To [ASTM C920] [CAN/CGSB-19.24]: type S; grade NS; class 25; use NT, M, A, O.

.8 Type S-8: Horizontal joint sealant; two component, self-levelling.

.1 To [ASTM C920] [CAN/CGSB-19.13]: type M; grade P; class 25; use T, M, O.

.9 Type S-9: One part moisture curing, low modulus polyurethane sealant for sealing joints in level and slightly slope surfaces conforming to [ASTM C920] [CAN/CGSB-19.24], type S, grade P, class 50, use T, M, A,O, MC-1-25-B-N.

.10 Type S-10: Control joint sealant: two-component, epoxy-urethane, self-levelling, load bearing saw cut or preformed control joints.

.11 Type S-11 Control Joint Sealant: Two component, polyurea based, load bearing, self levelling sealant.

.12 Type S-12 Control Joint Sealant: Two component, semi-rigid epoxy, load bearing, self levelling sealant.

.13 Type S-13: One-component polyurethane sealant; medium-modulus, non-sag, low-VOC, UV stable, to [CAN/CGSB-19.24].

.14 Type S-14: Polysulfide two part:

.1 Self-levelling to CAN/CGSB-19.24, Type 1, Class B.

.2 Non-sag: to CAN/CGSB-19.24, Type 2, Class B.

.15 Type S-15: Polysulfide one part:

.1 [Self-levelling: to] GRADE P, Class [35] [25]. Use [MC-1-40-B-N] [MC-1-25-B-N].

.2 Non-sag: Grade NS, Class [35] [25] use M, A.

.16 Type S16: To [ASTM C920, Two-component, Type M, Grade P, Class 25] [FS-SS-S-200E, Type 2], aviation fuel-resistant; polyurethane elastomeric, chemical cured.

2.05 SEALANT SELECTION

.1 Where no specific type of sealant is scheduled, provide one of the sealants indicated in this Section appropriate for its application and consistent with manufacturer's recommendations and the recommendations of SWRI, Sealants: The Professionals' Guide.

.2 Make sealant selections consistent with manufacturer's recommendations.

.3 Use acrylic sealant Type S-1 only on the interior and only in situations where little or no movement can occur.

.4 Use mould & mildew resistant silicone sealant Type S-2 for nonmoving joints in washrooms and kitchens. Do not use on floors.

.5 Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type specified.

.6 Use structural glazing silicone Type S-4 for sealing glass, interior and exterior.

.7 Use acoustical sealant Type S-5 and air seal sealant Type S-3 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.

.8 Use multi component sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.

.9 Use multi component sealant Type S-8 for horizontal joint sealant of plaza, floors and decks, exterior areas only, subject to pedestrian and vehicular traffic.

.10 Use polyurethane, semi-self levelling sealant Type S-9 for in expansion joints in sidewalks, plazas, floors and other pedestrian and vehicular horizontal surfaces with slopes up to 6%.

.11 Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.

.12 Use control joint sealant S-10 as filler for interior only, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.

.13 Use control joint sealant S-11 as filler for interior, horizontal saw cut or preformed control joints, where joints are subject to low temperatures (freezer floors) and where joints require nosing support.

.14 Use control joint sealant S-12 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to thermal shock conditions, traffic loops, and where a high bond strength is required.

.15 Use sealant S-13 for sealing exterior holes and penetrations around pipes and other services passing through concrete foundations and requiring greater movement capability.

2.06 ACCESSORIES

.1 Preformed compressible and non-compressible back-up materials that are non-staining, compatible with joint substrate, sealants, primers, and other joint fillers, and are approved for applications indicated by sealant manufacturer based on site experience and laboratory testing:

.1 Rod Type Sealant Backings:

.1 ASTM C1330, Type C (closed cell material with a surface skin), Type O (open cell material) or Type B (bi cellular material with a surface skin).

.2 Provide any of the preceding types, as approved in writing by joint sealant manufacturer for joint application indicated.

.3 Size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

.4 Non adhering to sealant, to maintain two sided adhesion across joint.

.2 High Density Foam:

.1 Extruded closed cell polyvinyl chloride (PVC), extruded polyethylene, closed cell, Shore A hardness 20, tensile strength 140 to 200 kPa, extruded polyolefin foam, 32 kg/m ^{3} density, or neoprene foam backer, size as recommended by manufacturer.

.3 Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, non absorbent to water and gas, capable of remaining resilient at temperatures down to 15 deg C. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

.4 Bond Breaker Tape:

.1 Polyethylene bond breaker tape or other tape recommended by sealant manufacturer which will not bond to sealant.

.2 Preformed Sealants:

.1 Preformed Silicone Sealant System: Manufacturer's standard system consisting of pre-cured low modulus silicone extrusion, in sizes to fit joint widths indicated, combined with a neutral curing silicone sealant for bonding extrusions to substrates.

.2 Preformed Hollow Neoprene Gasket: Manufacturer's standard preformed polychloroprene elastomeric joint seal of the open cell compression type complying with ASTM D2628 and with requirements for size, profile and cross sectional design.

.3 Bond Breaker: Pressure-sensitive plastic tape that will not bond to sealants.

.4 Joint Cleaner: Provide a non-corrosive and non-staining type, compatible with joint forming materials and sealant in accordance with sealant manufacturer's recommendations

.5 Primer: Provide in accordance with sealant manufacturer's recommendations.

.6 Masking Tape: Non-absorbent type, non-staining, compatible with joint sealant and joint substrates.

2.07 COLOURS

.1 Sealant Colours: Match colour of adjacent materials where visible, as selected by HWDSB and JASON FUNG ARCHITECT INC., from manufacturer's complete colour range.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed are acceptable for joint sealants installation in accordance with manufacturer's instructions.

.1 Visually inspect substrate.

.2 Verify joint surfaces are dry and frost free.

.3 Verify substrates are without contaminants capable of interfering with sealant adhesion. Remove contaminants where occurring.

.4 Examine joint sizes and conditions to establish acceptable depth to width ratio for installation of backup materials and application of sealants.

.5 Verify joint widths are within the limits recommended by joint sealant manufacturer for applications indicated.

.6 Inform HWDSB of unacceptable conditions immediately upon discovery.

.7 Proceed with installation only after unacceptable conditions have been remedied.

3.02 SURFACE PREPARATION

.1 Clean bonding joint surfaces of harmful contaminates including dust, rust, oil grease, and other matter which may impair adhesion.

.2 Do not apply sealants to joint substrates treated with sealer, curing compound, water repellent, or other coatings unless tests have been performed to ensure compatibility of materials. Remove coatings as required.

.3 Prepare surfaces in accordance with manufacturer's directions.

3.03 PRIMING

.1 Mask adjacent surfaces prior to priming and sealing where necessary to prevent staining.

.2 Prime sides of joints in accordance with sealant manufacturer's instructions immediately applying sealant, except when manufacturer's instructions explicitly state priming is not required.

.3 Prime all porous material (e.g. wood, masonry, concrete, ceramic or paver tile, etc).

3.04 BACKUP MATERIAL

.1 Provide backer rod as specified, to limit depth of sealant and to act as bond breaker at back of joint.

.2 Install joint filler to achieve correct joint depth and shape, with approximately 30% compression.

.3 Apply paper masking tape to back of joint to act as bond break where depth of joint does not permit the use of backer rod.

.4 Ensure that no joints are formed which are bonded on adjacent sides where there is any possibility of movement.

3.05 MIXING

.1 Mix materials in strict accordance with sealant manufacturer's instructions.

3.06 APPLICATION

.1 Sealant: Application: Apply sealants to recommendations of ASTM C1193, and of ASTM C1481 for EIFS systems, and in accordance with manufacturer's instructions, and as follows:

.1 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.

.2 Mask edges of joint where irregular surface or sensitive joint border exists to provide neat joint.

.3 For joints where movement is possible, apply backer rod to achieve a joint depth of one half the joint width but not less than 9 mm; for joints larger than 25 mm use a depth of 13 mm

.4 Apply sealant in a continuous beads.

.5 Apply sealant using gun with proper size nozzle.

.6 Fill voids and joints solid.

.7 Form sealant surface with a smooth full bead, without from ridges, wrinkles, sags, air pockets, embedded impurities.

.8 Tool exposed surfaces before skinning begins to give slightly concave shape.

.9 Ensure bead is solid, filling entire space between sides and bedding material, exerting sufficient pressure to obtain maximum bond, by allowing sealant to bulge out in advance of nozzle.

.10 Apply sealant within recommended temperature ranges. Consult manufacturer when sealant cannot be applied within recommended temperature range.

.11 Seal at all locations where dissimilar material meet.

.2 Sealant Curing:

.1 Cure sealants in accordance with sealant manufacturer's instructions.

.2 Do not cover up sealants until after curing has completed.

3.07 CLEANING

.1 Progress Cleaning: Clean in accordance with Section 01 74 00 - Cleaning.

.1 Clean adjacent surfaces immediately of excess primers and sealants.

.2 Remove excess and droppings, using recommended cleaners as work progresses.

.3 Remove masking tape after initial set of sealant.

.2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning upon completion.

.3 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

.1 Do not dispose of unused sealant materials into sewer system, streams, lakes, onto ground, or other location where it might pose a health or environmental hazard.

.2 Divert unused sealants from landfill to a hazardous material collection site.

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

.4 Dispose of hazardous materials in accordance with the CEPA, TDGA, regional and municipal regulations.

3.08 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by joint sealants installation.

3.09 SCHEDULE

.1 Use acrylic sealant Type S-1 only on the interior and only where little or no movement can occur.

.2 Use mould and mildew-resistant silicone sealant Type S-2 for non-moving joints in washrooms and kitchens. Do not use on floors.

.3 Use silicone general construction sealant Type S-3 or Type S-6 and S-7 for all joints, interior and exterior, where no other specific sealant type is specified.

.4 Use structural glazing silicone Type S-4 for sealing structural glass and sealing butt-to glazing joints, interior and exterior.

.5 Use acoustical sealant Type S-5 only where they will be fully concealed and only where no constant or consistent air pressure difference will exist across the joint.

.6 Use multicomponent sealant type S-6, primed penetration element surfaces other than concrete, for mechanical and electrical service penetrations in concrete foundation walls.

.7 Use multicomponent sealant type S-6, at perimeters of exterior openings where frames meet exterior facade of building (e.g., brick, block, precast masonry).

.8 Use multicomponent sealant Type S-8 for horizontal joint sealant of plaza, floors and decks, exterior areas only, subject to pedestrian and vehicular traffic.

.9 Use sealant Type S-8 for exterior joints in horizontal wearing surfaces.

.10 Use polyurethane, semi-self-levelling sealant Type S-9 for in expansion joints in sidewalks, plazas, floors and other pedestrian and vehicular horizontal surfaces with slopes up to 6%.

.11 Use control joint sealant S-10 as filler for interior, horizontal saw cut or preformed control joints where joints are subject to load bearing conditions.

.12 Use control joint sealant S-11 as filler for interior, horizontal saw cut or preformed control joints, where joints are subject to low temperatures (freezer room floors) and where joints require

nosing support.

.13 Use control joint sealant S-12 as filler for interior, horizontal saw cut, or preformed control joints where joints are subject to thermal shock conditions, traffic loops, and where a high bond strength is required.

.14 Use sealant S-13 for exterior holes and penetrations around pipes and other services passing through concrete foundations and requiring greater movement capability.

.15 Use sealant S-16 in pavement wherever fuel oils may be present

.16 In addition, provide joint sealants at the following conditions:

.17 Seal perimeters of hollow metal door frames on both sides.

.18 Seal control joints in gypsum board, except where prefabricated control joints are specified.

.19 Seal control joints in EIFS and stucco.

.20 Seal junctures between interior partitions with exterior walls.

.21 Seal window and door frames around the inside perimeter, so that an airtight seal is obtained, as indicated on Drawings.

.22 Seal joints in floors and walls and around service and mechanical and electrical fixture penetrations.

.23 Perimeter of bath fixtures (e.g., sinks, tubs, urinals, water closets, basins, vanities).

.24 Expansion and control joints in exterior surfaces of poured-in-place concrete walls.

.25 Expansion and control joints in exterior surfaces of precast architectural wall panels.

.26 Movement, control and expansion joints in exterior surfaces of unit masonry walls.

.27 Coping joints and coping-to facade joints.

.28 Cornice and wash (or horizontal surface joints).

.29 Seal interior perimeters of exterior openings as detailed on Drawings.

.30 Control and expansion joints on the interior of exterior cast-in place concrete walls.

.31 Expansion and control joints on the interior of exterior precast, architectural wall panels.

.32 Joints of underside of precast beams or planks.

.33 Movement, control and expansion joints on the interior of exterior surfaces of unit masonry walls.

.34 Interior control and expansion joints in floor surfaces.

.35 Perimeters of interior frames and exterior frames.

.36 Movement, control and expansion joints in exterior surfaces of unit masonry walls.

.37 Joints at tops of non-load bearing masonry walls at the underside of poured concrete.

.38 Exposed interior control joints in gypsum board.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 07 92 00 – Joint Sealants

.2 Section 08 80 00 – Glazing

.3 Section 08 90 00 - Louvres and Vents

1.02 REFERENCE STANDARDS

.1 American National Standards Institute/Steel Door Institute (ANSI/SDI):

.1 ANSI/SDI A250.7-[1997], Nomenclature for Standard Steel Doors and Steel Frames

.2 ANSI/SDI A250.11-[12], Recommended Erection Instructions for Steel Frames

.2 ASTM International (ASTM):

.1 ASTM A167-[99], Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip (Withdrawn)

.2 ASTM A653/A653M-[18], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.3 ASTM A780/A780M-[20], Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

.4 ASTM A879/A879M-[12], Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

.5 ASTM A924/A924M-[20], Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

.6 ASTM B29-[19], Standard Specification for Refined Lead

.7 ASTM B749-[20], Standard Specification for Lead and Lead Alloy Strip, Sheet, and Plate Products

.8 ASTM D4726-[18], Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors

.9 ASTM E90-[09], Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

.10 ASTM E413-[16], Classification for Rating Sound Insulation

.11 ASTM E1425-[14], Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems

.12 ASTM F2247-[18], Standard Test Method for Metal Doors Used in Blast Resistant Applications (Equivalent Static Load Method)

.3 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-1.132-M90, Zinc Chromate Primer, Low Moisture Sensitivity

.2 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating

.3 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors

.4 CAN/CGSB 82.5-M88, Insulated Steel Doors

.4 CSA Group (CSA):

.1 CSA G40.20-[13]/G40.21-[13], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

.2 CSA W59-[18], Welded Steel Construction[, Includes Errata (2020)]

.5 Canadian Steel Door Manufacturers Association (CSDMA):

.1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, [2000]

.2 Recommended Specifications for Commercial Steel Doors and Frames, [2006]

.3 Recommended Selection and Usage Guide for Commercial Steel Door and Frame Products, [2009]

.4 Storage and Installation Guide, [2012]

.6 Fenestration & Glazing Industry Alliance (FGIA) (formerly American Architectural Manufacturers Association (AAMA)):

.1 AAMA 812-[19], Voluntary Practice for Assessment of Frame Deflection When Using One Component Polyurethane Foams for Air-Sealing Rough Openings of Fenestration Installations

.7 National Council on Radiation Protection and Measurements (NCRP):

.1 Report No. 049, Structural Shielding Design and Evaluation for Medical Use of X-Rays and Gamma Rays of Energies up to 10 MeV [(1976)]

.8 National Fire Protection Association (NFPA):

.1 NFPA 80-[2013], Standard for Fire Doors and Other Opening Protectives

.2 NFPA 252-[2022], Standard Methods of Fire Tests of Door Assemblies

.9 Steel Door Institute (SDI):

.1 SDI-108-[18], Recommended Selection and Usage Guide for Standard Steel Doors

.2 SDI-111-[09], Recommended Details for Standard Steel Doors, Frames, Accessories and Related Components

.3 SDI-122-[15], Installation Troubleshooting Guide for Standard Steel Doors and Frames

.10 Underwriters Laboratories (UL):

.1 UL 2985-[2015], Sustainability Standard for Thermal Insulation

.11 ULC Standards (ULC):

.1 CAN/ULC-S104-[15], Standard Method for Fire Tests of Door Assemblies

.2 CAN/ULC-S105:[2016], Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104

.3 CAN/ULC S106-[15], Standard Method for Fire Tests of Window and Glass Block Assemblies

.4 CAN/ULC-S701.1:[2017], Standard for Thermal Insulation, Polystyrene Boards

.5 CAN/ULC-S702-[14], Standard for Mineral Fibre Thermal Insulation for Buildings

.6 CAN/ULC-S704-[11], Standard for Thermal Insulation, Polyurethane and Polyisocyanurate, Boards, Faced

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Coordination:

.1 Coordinate primers for doors and frames with site-applied paint as indicated in Section 09 91 23 - Interior Painting.

.2 Coordinate throat dimensions based on actual material used for wall and partition

construction assemblies.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's product data for each type of door and frame. Indicate door designation, type and model, product characteristics, core description, fabrication details, dimensions, fire-protection rating, finishes, and limitations.

.2 Submit WHMIS Safety Data Sheet (SDS).

.3 Shop Drawings:

.1 For each type of door, indicate material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware, fire-protection rating, and finishes.

.2 For each type of frame, indicate material, core metal thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, reinforcing, fire-protection rating, sound transmission classification rating, and finishes.

.3 Include a schedule identifying each unit with door marks and numbers matching numbering on Drawings and door schedule.

.4 Samples:

.1 Submit one 305 x 305mm door section for each door type, showing corner detail, glazing detail and butt reinforcements.

.2 Submit one 305 x 305-mm corner sample of each frame type, illustrating corner detail and welding quality.

.3 Show butt cut-out, glazing stops, 305mm long removable mullion connection or snap-on trim with clips.

.4 Samples will not be returned for inclusion into work.

.5 Certificates:

.1 Where fire-protection rated door and frame exceeds size limitations of fire labelled assemblies, submit evidence indicating compliance with fire labelling for door and frame assembly.

.2 Radiation Protection Compliance: For radiation protection assemblies, submit evidence of compliance in accordance with the requirements of the Cancer Agency, the Ontario or Hamilton Occupational Health and Safety, Radiation Safety and Protection Branch, and the National Council on Radiation Protection and Measurement.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section Section 01 78 00 - Closeout Submittals.

.2 Warranty Documentation: Submit manufacturer's material and fabrication warranty.

1.06 QUALITY ASSURANCE

.1 Qualifications:

.1 Manufacturer: A member in good standing of the Canadian Steel Door Manufacturers

Association.

.2 Installers: Experienced with installation of hollow metal doors and frames of similar complexity and scope to that required for the Project.

.3 Testing Agencies: Provide doors and frames under label service program of a testing agency acceptable to authorities having jurisdiction (AHJ).

.2 Manufacturer: Obtain doors and frames from a single manufacturer.

.3 Mock-Ups:

.1 Provide site mock-up for work of this Section indicating methods and materials, and proposed procedures to achieve design intent in accordance with Section 01 43 00 - Quality Assurance, and to comply with the following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and size as directed by HWDSB and JASON FUNG ARCHITECT INC.

.2 Obtain HWDSB and JASON FUNG ARCHITECT INC.'s acceptance of mock-ups before starting construction.

.3 Use mock-up throughout construction period as a standard of acceptance for work of this Section.

.4 Accepted mock-up may not form part of Work.

1.07 DELIVERY, STORAGE, AND HANDLING

.1 Perform in accordance CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging with manufacturer's labels.

.1 Provide temporary protection during delivery and site storage to prevent distortion, surface damage, and rust.

.2 After arrival on site, remove wet wrapping materials, inspect doors and frames for damage, and notify delivery company and supplier if damage is found.

.3 Minor damage may be repaired if refinished products match new work, and are acceptable to HWDSB.

.3 Storage and Handling Requirements:

.1 Store materials off ground, in a dry, well-ventilated indoor location, in a manner that prevents sagging, bowing, or twisting, and in accordance with manufacturer's recommendations, and CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames.

.2 Store with space between stacked doors to allow air circulation.

.3 Store and protect steel doors and frames from nicks, scratches, and distortion.

1.08 SITE CONDITIONS

.1 Site Measurements: Before fabrication, verify actual dimensions of openings by measuring on site, and indicate actual measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

.2 Established Dimensions: When site measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating doors and frames without site measurements. Coordinate site construction to ensure that actual site dimensions correspond to established dimensions.

1.09 WARRANTY

.1 Manufacturer's Warranty: Submit manufacturer's standard warranty.

2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

.1 Steel Fire-Protection Rated Doors, Frames, and Screens: Labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 and CAN/ULC-S105 for ratings indicated.

.2 Affix appropriate label to each opening indicating the labelling requirement, as follows:

.1 At standard size openings: Fire endurance rating; radiation protection

.2 At oversized openings: Unclassified as to fire rating; radiation protection

2.03 PERFORMANCE REQUIREMENTS

.1 Steel Fire-Rated Doors and Frames: Labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 or NFPA 252 for ratings specified or indicated.

.2 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN/ULC-S104, CAN/ULC-S106 or NFPA 252 and listed by a nationally recognized agency having factory inspection services.

2.04 MATERIALS

.1 Interior Doors and Frames: Metallic coated steel sheets in accordance with ASTM A924/A924M, coated to ASTM A653/A653M, Commercial Steel (CS), Type B, ZF75 galvannealed, stretcher levelled standard of flatness where used for face sheets.

.3 Metallic Coated Steel Sheet Thickness: Minimum thickness in accordance with CSDMA, Recommended Specifications for Commercial Steel Door and Frame Products, Table 1 and Appendix 1 SDI-111.

.4 Reinforcement Channels: To CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/653M, ZF75.

.5 Cast or Rolled Pure Sheet Lead: To ASTM B29, ASTM B749, weight: 14.6 kg/m^2, thickness 1.2mm.

.6 Composites: Balance of core materials used in conjunction with lead, in accordance with manufacturer's proprietary design.

2.05 DOOR CORE MATERIALS

.1 Honeycomb: Structural small cell, maximum 25mm kraft paper, minimum 36kg weight per ream, minimum 16.5kg/m^3 density, and sanded to required thickness.

.2 Fibreglass with Vertical Steel Stiffeners: To CAN/ULC-S702, loose batt, semi-rigid type, density 24

kg/m³, face sheets laminated, spot welded to each face sheet at 150 mm on centre.

.3 Expanded Polystyrene: To CAN/ULC-S701.1 type 4, rigid extruded board, closed cell, fire retardant treated, density 16 to 32 kg/m³, RSI 0.8/25 mm, to UL 2985: Thermal Insulation Materials

2.06 ADHESIVES

.1 Honeycomb Core and Steel Component Adhesive: Heat resistant, spray grade, polyurethane, resin reinforced polychloroprene.

2.07 ACCESSORIES

.1 Touch-up Primer: To CAN/CGSB-1.181 or CAN/CGSB 1.132

.2 Interior Top Caps: Steel

.6 Door Bottom Seal: Undercut

.7 Door Silencers/Bumpers: Single stud neoprene type, black colour. Self-adhesive type silencers are not acceptable.

.8 Metallic Paste Filler: To manufacturer's standard.

.9 Fire Labels: Metal riveted

.10 Site-Applied Sealant at Frame Perimeter: as indicated in Section 07 92 00 – Joint Sealants.

.11 Glazing Stops: Formed steel having 1.0 mm metal core thickness, screw attached. Accurately fit and butt at corners, glazing trim and stops, locate on secure side of door or facing interior of room.

.12 Glazing: as indicated in Section 08 80 00 – Glazing.

.13 Floor Anchors and Channel Spreaders: 1.60-mm nominal tee anchors, 1.19-mm wall stud anchors, and provide anchors appropriate to site conditions, as follows:

.1 Exterior Locations: Hot-dipped, zinc-coated

.2 Interior Locations: Wipe coat galvanized

.3 At Masonry: Corrugated, galvanized tee anchors or heavy gauge galvanized wire ties

.4 Drilled stud anchors for wire tie to studs

.5 At Existing Concrete Openings: Lag bolts, shields and bushing

.14 Exposed Fasteners: Type 316 stainless steel to ASTM A167.

2.08 FABRICATION - FRAMES

.1 Fabricate frames in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames SDI-111.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Interior Frames: 1.6 mm welded type construction.

.1 Provide minimum 16mm stop height for factory-sealed double-glazed units.

.4 Blank, reinforce, drill, and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface-mounted hardware.

.6 Protect mortised cut-outs with steel guard boxes.

.7 Reinforce frames for surface-mounted hardware.

.8 Prepare door openings for door silencers:

.1 Three silencers on strike jamb for single door openings.

.2 Two silencers on heads for double door openings.

.9 Provide fire labelled frame products for openings requiring fire protection ratings, as scheduled. Test products in conformance with CAN/ULC-S104, CAN/ULC-S106, NFPA 252 and list by a nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

2.09 FRAME ANCHORAGE

.1 Provide anchorage to floor and wall construction.

.2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.3 Provide 2 anchors for rebate opening heights up to 1520 mm, and one additional anchor for each additional 760 mm of height or fraction thereof.

.4 Locate anchors for frames in previously placed concrete, masonry or structural steel a maximum 150mm from top and bottom of each jamb and intermediate anchors at a maximum 660 mm on centre.

2.10 FRAMES - WELDED TYPE

.1 Perform welding to CSA W59.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails, and sills.

.4 Grind welded joints and corners to flat plane, fill with metallic paste, and sand to uniform smooth finish.

.5 Securely attach floor anchors to inside of each jamb profile.

.6 Weld in two temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.11 FABRICATION – FRAMES, KNOCKED-DOWN TYPE

.1 Ship knocked-down type frames unassembled.

.2 Provide frames with mechanical joints which interlock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames SDI-122.

.3 Securely attach floor anchors to inside of each jamb profile.

2.12 FABRICATION - FRAMES, SLIP-ON TYPE

.1 Ship slip-on type frames unassembled.

.2 Provide frames in accordance with SDI-122 and manufacturer's instructions.

.3 Provide slip-on frames with manufacturer's proprietary design of wall anchorage comprising single, adjustable tension type per jamb, and provision for a secure attachment of each jamb base to stud runners.

2.13 FABRICATION – DOORS, GENERAL

.1 Doors: Swing type, flush, with provision for glass and louvred openings as indicated.

.2 Interior doors: Honeycomb or laminated core construction.

.3 Laminated Core Doors:

.1 Form both face sheets from a sheet of 16 gauge steel.

.4 Factory-prepare 12.7-mm diameter holes and larger on-site at time of hardware installation, except for mounting and through-bolt holes.

.5 Prepare doors for semi-mortised mounting of automatic door bottoms where scheduled in Section 08 71 00 – Door Hardware.

.6 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.7 Provide fire labelled doors for openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN/ULC-S104 or NFPA 252, listed by a nationally recognized agency having factory inspection services, and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.13 Manufacturer's nameplates on doors are not permitted. Nameplates on hinge edge are acceptable.

2.14 FABRICATION – DOORS, [HONEYCOMB] [AND] [INSULATED] CORE

.1 Form face sheets for interior doors from 1.2mm sheet steel with honeycomb core laminated under pressure to face sheets.

2.15 FABRICATION – DOORS, REINFORCED STEEL

.1 Form face sheets for interior doors from 1.2mm sheet steel.

.2 Reinforce doors with vertical stiffeners, securely welded to face sheets at a maximum 150 mm on centre.

.3 Fill voids between stiffeners of exterior doors with fibreglass core.

.4 Fill voids between stiffeners of interior doors with fiberglass or honeycomb core.

2.17 FABRICATION - GLAZING STOPS FOR DOORS AND FRAMES

.1 Make provisions for louvres and glazing as indicated and provide necessary glazing stops.

.1 Provide stainless steel glazing stops for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.

.2 Fabricate glazing stops as a formed channel that is a minimum 16mm high, accurately fitted, butted at corners and fastened to frame sections with countersunk oval head tamperproof sheet metal stainless steel screws.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: Verify conditions of substrates previously installed under other Sections or Contracts are acceptable for steel doors and frames installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of HWDSB

.2 Inform HWDSB of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.

3.02 INSTALLATION - GENERAL

.1 Install doors and frames to CSDMA Guide Specification for Installation and Storage of Hollow Metal Doors and Frames SDI-122.

.2 Install fire-rated doors and frames in accordance with NFPA 80.

.3 Isolate steel from direct contact with dissimilar metals, concrete, and masonry.

3.03 INSTALLATION - FRAMES

.1 Set frames plumb, square, level, and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position until built-in:

.1 Remove temporary jamb spreaders.

.2 Provide temporary wood spreaders at third points of frame rebate height to maintain frame width until adjacent building-in work completed.

.3 Provide vertical support at centre of head for openings exceeding 1200 mm in width.

.4 Remove wood spreaders after frames have been built-in.

.4 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Install door silencers.

.6 Install louvres supplied under Section 08 90 00 - Louvres and Vents in accordance with manufacturer's instructions.

3.04 INSTALLATION – DOOR HARDWARE

.1 Install hardware in accordance with manufacturer's instructions and Section 08 71 00 - Door Hardware, using manufacturer's door hardware templates.

3.05 INSTALLATION - GLAZING

.1 Install glazing in doors and frames in accordance with Section 08 80 00 – Glazing.

3.06 SITE QUALITY CONTROL

.1 Tolerances: Provide even margins between doors and jambs, and doors and finished floor and thresholds as follows.

.1 Hinge Side: 1.0 mm

.2 Latch Side and Head: 1.5 mm

.3 Finished floor, non-combustible sill] nd thresholds: Maximum 19 mm

3.07 ADJUSTING

.1 Use primer to touch-up finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to uniform, smooth finish.

.3 Repair damage to zinc coatings in accordance with ASTM A780/A780M.

.4 Repair damage to adjacent materials caused by metal doors and frames installation.

.5 Adjust operable parts for correct function.

3.08 CLEANING

.1 Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning, and as follows:

.1 Remove traces of primer, sealants, epoxy, and filler materials. Clean doors and frames.

.2 Clean glass and glazing materials with approved non-abrasive cleaner.

.2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.

.3 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

3.09 PROTECTION

.1 Protect installed products and components from damage during construction. Install temporary protective covering to exposed components.

.2 Protect thresholds, hardware, frames, doors, and glass from damage. Lock operative door bottom in up position.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 07 92 00 - Joint Sealants

.2 Section 08 80 00 - Glazing

1.02 REFERENCE STANDARDS

.1 Aluminum Association (AA):

.1 AA DAF 45-[03], Designation System for Aluminum Finishes

.2 ASTM International (ASTM):

.1 ASTM A36/A36M-[19], Specification for Carbon Structural Steel

.2 ASTM A123/A123M-[13], Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

.3 ASTM A167-[99], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip

.4 ASTM A653/A653M-[13], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

.5 ASTM B209-[14], Specification for Aluminum and Aluminum-Alloy Sheet and Plate

.6 ASTM B221-[20], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

.7 ASTM C864-[05], Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers

.8 ASTM E283-[04], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen

.9 ASTM E330/E330M-[02], Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference

.10 ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference

.11 ASTM E413-[10], Classification for Rating Sound Insulation

.12 ASTM E547-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference

.13 ASTM E779-[19], Standard Test Method for Determining Air Leakage Rate by Fan Pressurization

.14 ASTM E1105-[00], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference

.3 Canadian General Standards Board (CGSB):

.1 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings

.4 CSA Group (CSA):

.1 CSA A440.6:[20], High exposure fenestration installation

.2 CAN/CSA G40.20/G40.21-[13], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel

.3 CAN/CSA S136-[16], North American Specification for the Design of Cold Formed Steel Structural Members

.4 CAN/CSA-S157-[05]/S157.1-[05], Strength Design in Aluminum/Commentary on CAN/CSA-S157-[05], Strength Design in Aluminum

.5 CSA W59.2-[2018], Welded Aluminum Construction

.5 Fenestration & Glazing Industry Alliance (FGIA) (formerly American Architectural Manufacturers Association (AAMA)):

.1 AAMA CW-10-[15], Care and Handling of Architectural Aluminum from Shop to Site

.2 AAMA CW-11-[85], Design Wind Loads and Boundary Layer Wind Tunnel Testing

.3 AAMA T1R-A1-[15], Sound Control for Fenestration Products

.4 AAMA 501-[15], Methods of Test for Exterior Walls

.5 AAMA 501.2-[15], Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems

.6 AAMA 502-[21], Voluntary Specification for Field Testing of Newly Installed Fenestration Products

.7 AAMA 611-[20], Voluntary Specifications for Anodized Finishes Architectural Aluminum

.8 AAMA 612-[20], Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum

.9 AAMA 1503-[09], Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

.10 AAMA 2603-[21], Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)

.11 AAMA 2604-[21], Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)

.12 AAMA 2605-[20], Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)

.6 Green Seal Environmental Standards (GS):

.1 GS-11-[15], Paints and Coatings

.7 Master Painters Institute (MPI):

.1 Architectural Painting Specification Manual - [current edition]

.8 National Research Council Canada (NRC):

.1 National Building Code of Canada [2015] (NBC)

.9 Society for Protective Coatings (SSPC):

.1 SSPC - Paint 20-[2019], Zinc Rich Coating, Inorganic and Organic

.2 SSPC - Paint 25 - [97], BCS, Zinc Oxide, Alkyd, Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2

.10 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards:

.1 SCAQMD Rule 1113-[2016], Architectural Coatings

.2 SCAQMD Rule 1168-[2017], Adhesives and Sealants Applications

.11 Underwriters Laboratories (UL):

.1 UL 2761-[2011], Sustainability for Sealants and Caulking Compounds

.2 UL 2768-[2011], Sustainability for Architectural Surface Coatings

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: coordinate work of this Section with installation of air barrier, vapour retarder, flashing, ductwork to rear of louvres.

.2 Preinstallation Meetings: Convene pre-installation meeting one week before beginning the work of this Section, with Contractor, Subcontractor andHWDSB in accordance with Section 01 31 19 - Project Meetings to:

.1 verify project requirements.

.2 review installation and substrate conditions.

.3 discuss coordination with other Subcontractors, and

.4 review manufacturer's installation instructions and warranty requirements.

.5 review existing site conditions adjacent to demolition areas.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's product data for each type of curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.

.3 Shop Drawings:

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

.2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related work, weep drainage network, expansion and contraction joint location and details, and site welding required.

.4 Samples:

.1 Submit for review and acceptance of each type of unit.

.2 Samples will not be returned for inclusion into work.

.3 Submit two samples 300 x 300mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.

.5 Delegated Design Submittals:

.1 Include framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

.6 Test Reports: When requested, submit engineering data and previous test results by independent laboratory which meet specified performance criteria.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Submit maintenance data for glazed aluminum curtain wall for incorporation into manual.

1.06 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:

.1 Supply extra stock materials of glass units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Supply 2 extra sealed glass units of each size required.

.3 Supply 2 extra insulated infill panels of each size required.

.4 Supply protected and packaged in wood crates suitable for storage. Clearly identify each crate.

.5 Deliver extra stock materials to HWDSB, upon completion of work of this Section.

.6 Store as directed by HWDSB.

1.07 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in manufacturing the systems specified in this Section with minimum ten years documented manufacturing experience, with projects of similar scope installed in Ontario, of the Place of the Work.

.2 Installer Qualifications: Company specializing in performing the work of this Section with minimum 10 years documented experience or approved by manufacturer.

.3 Mock-ups: Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.

.1 Construct 1000 x 1000 mm mock-up including intermediate mullion, corner mullion, column cover, vision glass light, and insulated infill panel.

.2 Mockup to include sloped glazed system and junction with vertical curtain wall and other vertical work mullions, muntins, structural member covers, vision glass lite, and insulated panel.

.3 Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

.4 HWDSB] will require 48 hours minimum to review the mock-up.

.5 Mock-up may not remain as part of finished work.

1.08 DELIVERY, STORAGE, AND HANDLING

.1 Perform in accordance with manufacturer specifications.

.2 Storage and Handling Requirements:

.1 Handle work of this Section in accordance with AAMA CW-10.

.2 Store materials off ground in a dry ventilated indoor location and in accordance with manufacturer's recommendations.

.3 Store and protect glazed aluminum curtain wall components from nicks, scratches, deformation, and damages.

.4 Protect prefinished aluminum surfaces with wrapping or strippable coating. Do not use

adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.09 AMBIENT CONDITIONS

.1 Install sealants when ambient and surface temperature is above 5°C minimum.

.2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

1.10 WARRANTY

.1 Manufacturer's warranty: Provide manufacturer's standard materials and fabrication warranty for 15 years beginning at Substantial Performance.

.1 Sealed glass units: Seal failure, misting and dusting for 10 years.

.2 Aluminum Finishes: Failure of finishes not attributed to normal weathering for 15 years.

2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

.1 Conform to applicable code for glass strength requirements.

2.02 SYSTEMS

.1 Description:

.1 Vertical glazed aluminum curtain wall system includes thermally broken tubular aluminum sections with self supporting framing, shop fabricated, factory prefinished, vision glass, spandrel infill panels, column covers, and louvres; related flashings, anchorage and attachment devices.

.2 Assembled system to permit re-glazing of individual glass (and infill panel) units from interior or exterior without requiring removal of structural mullion sections.

.2 Performance Requirements:

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with Ontario Building Code (OBC) as measured to AAMA CW 11, ASTM E330.

.2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable codes.

.3 Limit mullion deflection to flexure limit of glass with full recovery of glazing materials.

.4 Design glass unit dimensions and glass thicknesses to limits established in CAN/CGSB-12.20

.5 Design system to accommodate the following without damage to components or deterioration of seals:

.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Shortening of building concrete structural columns.

.6 Creep of concrete structural members.

.7 Mid-span slab edge deflection of 2 mm.

.6 Thermal resistance of curtain wall system (excluding vision areas): Minimum 3 RSI.

.7 Thermal resistance of vision glass areas: Minimum 5.6 RSI.

.9 Limit air infiltration through assembly to 0.0003 $m^3/s/m^2$ of fixed portions of curtain wall, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with ASTM E779, AAMA 501, ASTM E283.

.10 Vapour seal with interior atmospheric pressure of 25 mm sp, 22°C, 40% relative humidity: no failure.

.11 Water Penetration Resistance: No leakage when tested to ASTM E331 or ASTM E547.

.12 Condensation Index: Minimum 79 frame and 76 glass when tested to CSA-A440.

.13 Condensation Resistance: Minimum 82 frame and 81 glass when tested to AAMA 1503.

.14 Ensure system allows for expansion and contraction within system components when temperature range is 95°C over 12 hour period without causing detrimental affect to system components.

.15 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

.16 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.1 Position thermal insulation on exterior surface of air barrier and vapour retarder.

.17 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

.18 Reinforce curtain wall system to accommodate window washing guide rails.

.1 Supply sufficiently rigid anchors to resist loads caused by equipment platform, without damage to wall system.

2.03 MATERIALS

.1 Extruded aluminum: Alloy and temper recommended by producer or finisher for type of use and finish indicated, and to ASTM B221.

.2 Sheet aluminum: Alloy and temper recommended by producer or finisher for type of use and finish indicated, and to ASTM B209.

.3 Sheet steel: to CAN/CSA S136, ASTM A653/A653M; galvanized.

.4 Steel Sections: To CAN/CSA G40.20/G40.21, ASTM A36/A36M, ASTM A167 Type 304 stainless; shaped to suit mullion sections.

.5 Anchors: 3-way adjustable hot-dip galvanized cast iron.

.6 Fasteners: stainless or galvanized steel, aluminum, finish to match curtain wall.

.7 Bituminous Paint: Listed as a MPI Approved Product for category MPI #35, without thinner.

.8 Vertical glass units:

.1 Glass in exterior lites: Type 25.4mm double glazed.

.2 Glass in [entrance] lites: Type 25.4mm double glazed.

.3 Glass infill panels: Type 25.4mm double glazed..

.9 Fire Stopping Materials: In accordance with Section 07 84 00 - Firestopping.

.10 Gaskets: To ASTM C864.

.11 Sealants:

.1 Perimeter Sealant: As per manufacturer specification.

.2 Sealant used within system (not used for glazing): As per manufacturer specification.

.12 Mullion Profile:

.1 Vertical members: As per manufacturer specification.

.2 Horizontal members: As per manufacturer specification.

.3 Thermally broken with interior tubular section insulated from exterior pressure plate.

.4 Matching stops and pressure plate of sufficient size and strength to ensure adequate bite on glass and infill panels.

.5 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.

.6 Internal mullion baffles to eliminate "stack effect" air movement within internal spaces.

.18 Flashings: aluminum finish to match curtain wall mullion sections where exposed, secured with concealed fastening method.

.19 Louvres: extruded aluminum blade and frame, 100 mm deep, 45 degree slope with weather stop dam; aluminum blank-off panel, black colour, at rear for site cutting and sizing to suit mechanical duct attachment. Fabricate rigid to eliminate blade flutter.

.20 Louvre Screening: Bird screen at exhaust and insect screen at intake air louvre inside surface.

.21 Operable Sash: As per manufacturer specification.

.22 Integral Vapour Barrier: Compatible with membrane indicated on drawings.

.23 Integral Air Barrier: Compatible with membrane indicated on drawings.

2.04 FABRICATION

.1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly yet allowing installation and dynamic movement of perimeter seal.

.2 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.3 Prepare components to receive anchor devices. Install anchors.

.4 Install fasteners and attachments to ensure concealment from view.

.5 Prepare system components to receive exterior doors and hardware specified in drawings.

.6 Reinforce interior horizontal head rail to receive roller shade or blinds mounting brackets and attachments.

.7 Reinforce framing members for external imposed loads.

.8 Visible manufacturer's identification labels are not permitted.

.9 Finishes:

.1 Finish Coatings: To [AAMA 2603.8] [AAMA 2604] [AAMA 611] [AAMA 612] [AA designations].

.2 Exterior exposed aluminum surfaces: To [AAMA] [AA] [A41] [A42] [A43] [A44] anodized to [215-R1], 0.018 mm thickness, or powder coat to colour, colour to be reviewed with

HWDSB and JASON FUNG ARCHITECT INC...

.3 Exterior exposed aluminum surfaces: To prepare surface with [AAMA] [AA] pretreatment, fluoropolymer powder coating, or siliconized acrylic coating to colour as selected.

.4 Exterior exposed infill panel surfaces: Prepare surface with [AAMA] [AA] pretreatment, fluoropolymer powder coating, or siliconized acrylic coating to colour as selected.

.5 Interior exposed aluminum surfaces: To [AAMA] [AA] [A41] [A42] [A43] [A44] anodized to [215-R1], 0.018 mm thickness, prepared with a pretreatment, or powder coat to colour, colour to be reviewed with HWDSB and JASON FUNG ARCHITECT INC...

.6 Interior exposed aluminum surfaces: Prepare surface to [AAMA] [AA] pretreatment, fluoropolymer powder coating or siliconized acrylic coating to colour as selected.

.7 Interior surface of infill panel surfaces: Powder coat to colour, colour to be reviewed with HWDSB and JASON FUNG ARCHITECT INC.. or baked enamel paint to colour as selected. Site painted accordingly.

.8 Concealed steel items: galvanized to [ASTM A123] to 600gm/m^2 and primed with iron oxide paint.

.9 Apply two coats of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

2.05 SOURCE QUALITY CONTROL

.1 Design structural support framing components to CAN/CSA-S157 under direct supervision of a professional structural engineer experienced in design of this work and licensed in Ontario.

.2 Perform welding in accordance with CSA W59.2.

2.06 ACCESSORIES

.1 Solar Control Film: non-reflective, neutral coated polyester or polyester blend film, acrylic, abrasion-resistant coating, release liner, and weather-resistant pressure sensitive adhesive.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: Verify conditions of substrates previously installed are acceptable for aluminum curtain wall installation in accordance with manufacturer's instructions.

.1 Verify dimensions, tolerances, and method of attachment with other work.

.2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this Section.

.3 Proceed with installation only after unacceptable conditions have been remedied.

3.02 INSTALLATION

.1 Install curtain wall system in accordance with manufacturer's instructions and CAN/CSA-A440.6.

.2 Anchor to building structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Use alignment attachments and shims to permanently fasten system to building structure. Clean

weld surfaces; apply protective primer to site welds and adjacent surfaces.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Provide thermal isolation where components penetrate or disrupt building insulation.

.6 Install sill flashings.

.7 Install eave edge flashings at sloped glazing system.

.8 Coordinate installation of fire stop systems, specified in Section 07 84 00 - Firestopping, at each floor slab edge and intersection with vertical construction where indicated.

.9 Coordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.10 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.11 Install operating sash in accordance with Section 08 80 00 - Glazing, to glazing method required to achieve performance criteria, exterior wet or dry method of glazing].

.12 Install louvres, associated flashings, blank-off plates and screening. Fit blank-off plates tight to ductwork.

3.03 TOLERANCES

.1 Maximum variation from plumb: 1.5mm/m non-cumulative or 12mm/30 m, whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm

.3 Maximum sealant space between curtain wall and adjacent construction: 13 mm

3.04 SITE QUALITY CONTROL

.1 Site Tests and Inspection: Owner will Engage manufacturer's representative or independent testing agency to monitor quality of installation and perform tests and submit test reports.

.1 Test system to: [ASTM E1105] [and] [AAMA 501.2] [AAMA 502].

.1 Test three of the fenestration product specimens after the products have been completely installed for air leakage resistance and water penetration resistance as specified.

.2 Air leakage resistance tests to ASTM E779 shall be conducted at a uniform static test pressure of 15 Pa. The maximum allowable rate of air leakage shall not exceed L/s $\cdot m^2$.

.3 Water penetration resistance tests shall be conducted at a static test pressure of 8 Pa. No water penetration shall occur as defined in Section 5.3.4 of AAMA 502.

.2 Manufacturer's Site Services:

.1 Provide manufacturer's site services consisting of periodic site inspections of product installation in accordance with manufacturer's instructions.

.2 Provide report from manufacturer of curtain wall and glass verifying compliance of work of this Section in installing, protecting, and cleaning of products, and submit reports in acceptable format to verify compliance of the work of this Section within seven days of each review.

.3 Schedule of Site Visits:

.1 After delivery and storage of products, and when preparatory work on which this Section depends is complete, but before installation begins.

.2 During progress of work at 25%, 50%, and 75% complete.

.3 Upon completion of work, after final cleaning is complete.

3.05 ADJUSTING

.1 Adjust operating sash for smooth operation.

3.06 CLEANING

.1 Progress Cleaning: Clean frames and glazing in accordance with Section 01 74 00 - Cleaning.

.1 Remove temporary protective material from prefinished aluminum surfaces.

.2 Clean aluminum surfaces promptly after installation. Exercise care to avoid damage to coatings.

.3 Ensure curtain wall drainage system (weeps, drainage holes, channels, etc.) are unobstructed and free of dirt and sealants.

.2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.

.1 Wash exposed surfaces with mild solution of detergent and warm water, using soft, clean wiping cloths. Remove dirt from corners. Wipe surfaces clean.

.2 Clean glass and glazing materials with approved non-abrasive cleaner.

3.07 PROTECTION

.1 Protect installed products and components from damage during construction. Mark glass which may be subject to accidental breakage by Subcontractors. Use temporary markings that after removal do not stain or otherwise leave a perceptible effect.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 Aluminum Association (AA):

- .1 AA DAF 45-[03], Designation System for Aluminum Finishes

.2 ASTM International (ASTM):

- .1 ASTM A36/A36M-[19], Specification for Carbon Structural Steel
- .2 ASTM A123/A123M-[13], Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- .3 ASTM A167-[99], Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
- .4 ASTM A653/A653M-[13], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .5 ASTM B209-[14], Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- .6 ASTM B221-[20], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
- .7 ASTM C864-[05], Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers
- .8 ASTM E283-[04], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
- .9 ASTM E330/E330M-[02], Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference
- .10 ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference
- .11 ASTM E413-[10], Classification for Rating Sound Insulation
- .12 ASTM E547-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference
- .13 ASTM E779-[19], Standard Test Method for Determining Air Leakage Rate by Fan Pressurization
- .14 ASTM E1105-[00], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference

.3 Canadian General Standards Board (CGSB):

- .1 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings

.4 CSA Group (CSA):

- .1 CSA A440.6:[20], High exposure fenestration installation
- .2 CAN/CSA G40.20/G40.21-[13], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
- .3 CAN/CSA S136-[16], North American Specification for the Design of Cold Formed Steel Structural Members

.4 CAN/CSA-S157-[05]/S157.1-[05], Strength Design in Aluminum/Commentary on CAN/CSA-S157-[05], Strength Design in Aluminum

.5 CSA W59.2-[2018], Welded Aluminum Construction

.5 Fenestration & Glazing Industry Alliance (FGIA) (formerly American Architectural Manufacturers Association (AAMA)):

.1 AAMA CW-10-[15], Care and Handling of Architectural Aluminum from Shop to Site

.2 AAMA CW-11-[85], Design Wind Loads and Boundary Layer Wind Tunnel Testing

.3 AAMA T1R-A1-[15], Sound Control for Fenestration Products

.4 AAMA 501-[15], Methods of Test for Exterior Walls

.5 AAMA 501.2-[15], Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems

.6 AAMA 502-[21], Voluntary Specification for Field Testing of Newly Installed Fenestration Products

.7 AAMA 611-[20], Voluntary Specifications for Anodized Finishes Architectural Aluminum

.8 AAMA 612-[20], Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum

.9 AAMA 1503-[09], Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections

.10 AAMA 2603-[21], Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)

.11 AAMA 2604-[21], Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)

.12 AAMA 2605-[20], Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix)

.6 Green Seal Environmental Standards (GS):

.1 GS-11-[15], Paints and Coatings

.7 Master Painters Institute (MPI):

.1 Architectural Painting Specification Manual - [current edition]

.8 National Research Council Canada (NRC):

.1 National Building Code of Canada [2015] (NBC)

.9 Society for Protective Coatings (SSPC):

.1 SSPC - Paint 20-[2019], Zinc Rich Coating, Inorganic and Organic

.2 SSPC - Paint 25 - [97], BCS, Zinc Oxide, Alkyd, Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2

.10 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards:

.1 SCAQMD Rule 1113-[2016], Architectural Coatings

.2 SCAQMD Rule 1168-[2017], Adhesives and Sealants Applications

.11 Underwriters Laboratories (UL):

.1 UL 2761-[2011], Sustainability for Sealants and Caulking Compounds

.2 UL 2768-[2011], Sustainability for Architectural Surface Coatings

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: coordinate work of this Section with installation of air barrier, vapour retarder, flashing, ductwork to rear of louvres.

.2 Preinstallation Meetings: Convene pre-installation meeting one week before beginning the work of this Section, with Contractor, Subcontractor and HWDSB in accordance with Section 01 31 19 - Project Meetings to:

.1 verify project requirements.

.2 review installation and substrate conditions.

.3 discuss coordination with other Subcontractors, and

.4 review manufacturer's installation instructions and warranty requirements.

.5 review existing site conditions adjacent to demolition areas.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's product data for each type of curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations and water flow diagrams.

.3 Shop Drawings:

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

.2 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related work, weep drainage network, expansion and contraction joint location and details, and site welding required.

.4 Samples:

.1 Submit for review and acceptance of each type of unit.

.2 Samples will not be returned for inclusion into work.

.3 Submit two samples 300 x 300mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.

.5 Delegated Design Submittals:

.1 Include framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

.6 Test Reports: When requested, submit engineering data and previous test results by independent laboratory which meet specified performance criteria.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Submit maintenance data for glazed aluminum curtain wall for incorporation into manual.

1.06 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:

.1 Supply extra stock materials of glass units in accordance with Section 01 78 00 - Closeout Submittals.

.2 Supply 2 extra sealed glass units of each size required.

.3 Supply 2 extra insulated infill panels of each size required.

.4 Supply protected and packaged in wood crates suitable for storage. Clearly identify each crate.

.5 Deliver extra stock materials to HWDSB, upon completion of work of this Section.

.6 Store as directed by HWDSB.

1.07 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in manufacturing the systems specified in this Section with minimum ten years documented manufacturing experience, with projects of similar scope installed in Ontario, of the Place of the Work.

.2 Installer Qualifications: Company specializing in performing the work of this Section with minimum 10 years documented experience or approved by manufacturer.

.3 Mock-ups: Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.

.1 Construct 1000 x 1000 mm mock-up including intermediate mullion, corner mullion, column cover, vision glass light, and insulated infill panel.

.2 Mockup to include sloped glazed system and junction with vertical curtain wall and other vertical work mullions, muntins, structural member covers, vision glass lite, and insulated panel.

.3 Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.

.4 HWDSB] will require 48 hours minimum to review the mock-up.

.5 Mock-up may not remain as part of finished work.

1.08 DELIVERY, STORAGE, AND HANDLING

.1 Perform in accordance with manufacturer specifications.

.2 Storage and Handling Requirements:

.1 Handle work of this Section in accordance with AAMA CW-10.

.2 Store materials off ground in a dry ventilated indoor location and in accordance with manufacturer's recommendations.

.3 Store and protect glazed aluminum curtain wall components from nicks, scratches, deformation, and damages.

.4 Protect prefinished aluminum surfaces with wrapping or strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

1.09 AMBIENT CONDITIONS

.1 Install sealants when ambient and surface temperature is above 5°C minimum.

.2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

1.10 WARRANTY

.1 Manufacturer's warranty: Provide manufacturer's standard materials and fabrication warranty for 15 years beginning at Substantial Performance.

.1 Sealed glass units: Seal failure, misting and dusting for 10 years.

.2 Aluminum Finishes: Failure of finishes not attributed to normal weathering for 15 years.

2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

.1 Conform to applicable code for glass strength requirements.

2.02 Manufacturers

.1 Basis-of-Design Product:

.1 Kawneer Company Inc.

.2 Kawneer Series AA®6400/6500/6600 Windows

.2 Alternatives: Refer to Substitutions Section for procedures and submission requirements.

.1 Pre-Contract Bidding Period Substitutions: Submit written requests ten (10) days prior to bid date.

.2 Post-Contract (Construction Period) Substitutions: Submit written request in order to avoid window installation and construction delays.

.3 Product Literature and Drawings: Submit product literature and drawings modified to suit specific project requirements and job conditions.

.4 Certificates: Submit certificate(s) certifying substitute manufacturer (1) attesting to adherence to specification requirements for window system performance criteria, and (2) has been engaged in the design, manufacturer and fabrication of aluminum windows for a period of not less than ten (10) years. (Company Name)

.5 Test Reports: Submit test reports verifying compliance with each test requirement required by the project.

.6 Samples: Provide samples of typical product sections and finish samples in manufacturer's standard sizes.

.3 Substitution Acceptance: Acceptance will be in written form, either as an addendum or modification, and documented by a formal change order signed by the Owner and Contractor.

2.03 Materials

.1 Aluminum Extrusions: Alloy and temper recommended by aluminum window manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" (1.8) wall thickness at any location for the main frame and sash members.

.1 Recycled Content: Shall have a minimum of 50% mixed pre- and post-consumer recycled content.

.1 Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.

.2 Indicate relative dollar value of recycled content product to total dollar value of product included in project.

.3 Indicate location recovery of recycled content.

.4 Indicate location of manufacturing facility.

.2 Thermal Barrier: The thermal barrier shall be consisting of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.

.3 Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim, hardware, anchors, and other components.

.4 Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

.5 Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions; provide sufficient strength to withstand design pressure indicated.

.6 Sealant: For sealants required within fabricated windows, provide window manufacturer's standard, permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.

2.04 Window System

.1 Kawneer Series AA®6400/6500/6600 Windows

2.05 Glazing

.1 Glass and Glazing Materials: Refer to Division 08 Section "Glazing" for glass units and glazing requirements applicable to glazed aluminum window units.

.2 Glazing System: Glazing method shall be a wet/dry type in accordance with manufacturer's standards. Exterior glazing shall be TPE gasket. Interior glazing shall be snap-in type glazing beads with an interior gasket in accordance with AAMA 702 or ASTM C864.

2.06 Hardware

.1 General: Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.

.2 Projected Window Typical Hardware:

.1 Typical Hardware:

.1 Locking

.1 Single Handle Multi-Point Locks (Standard) Project-In

.2 Dual Handle Multi-Point Locks (Standard) Project-Out

.3 Cast White Bronze Cam Locks (Project-Out)

.4 Access Control Locks (Project-Out)

.2 Hinging

.1 4-Bar Hinges (Standard)

.2 Limit Stop

.3 Other

.1 Roto Operator (Project-Out)

.2 Pole Ring

.3 Pole

2.07 Accessories

.1 Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.

.2 Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.

.3 Sealants and joint fillers for joints at perimeter of window system as specified in Division 7 Section "Joint Sealants".

.4 Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

.5 Optional interior Trims: Extruded aluminum, 6063-T6 alloy and temper, extruded to profiles and details indicated.

.6 Interior Trims: The interior face trim minimum wall thickness shall be 0.062" (1.57 mm). The face trim shall snap-fit onto concealed mounting clip. Exposed fasteners shall not be accepted. The mounting clip shall be extruded aluminum of 6063-T6 alloy and temper. The minimum wall thickness shall be 0.062" (1.57 mm). The trim clips shall be provided in 4" (101.6 mm) lengths and spaced a maximum of 18" (457.2 mm) center to center.

.7 Coupling Mullions: Shall be extruded aluminum of 6063-T6 alloy and temper of profile and dimensions indicated on drawings. Mullions shall provide structural properties to resist wind pressure required by performance criteria and standards.

.8 Optional Insect Screens: Extruded aluminum frames, 6063-T6 alloy and temper, joined at corners: 18 x 16 mesh fiberglass screen cloth; frames finished to match aluminum windows; splines shall be extruded vinyl, removable to permit rescreening.

2.08 Fabrication

.1 Framing Members, General: Fabricate components that, when assembled, have the following characteristics:

.1 Profiles that are sharp, straight, and free of defects or deformations.

.2 Accurately fit joints; make joints flush, hairline and weatherproof.

.3 Means to drain water passing joints, condensation within framing members, and moisture migrating within the system to exterior.

.4 Physical and thermal isolation of glazing from framing members.

.5 Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.

.6 Provisions for field replacement of glazing.

.7 Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

.2 Window Vent and/or Vent Frame Joinery: Mitered and Mechanically clipped and/or staked. Factory sealed vent and /or vent frame and corner joints.

.3 Fabricate aluminum windows in sizes indicated. Include a complete system for assembling components and anchoring windows.

.4 Fabricate aluminum windows that are re-glazable without dismantling sash or framing.

.5 Thermally Improved Construction: Fabricate aluminum windows with an integral, concealed, low-conductance thermal barrier; located between exterior materials and window members exposed on interior side; in a manner that eliminates direct metal-to-metal contact. Thermal barriers shall be designed in accordance with AAMA TIR A8.

.6 Thermal Barrier: The thermal barrier shall be Kawneer consisting of two parallel glass fiber-reinforced nylon strips installed continuously and mechanically bonded to the aluminum.

.7 Glazing Stops: Provide snap-on glazing stops coordinated with Division 08 Section "Glazing" and glazing system indicated. Provide glazing stops to match frame.

2.09 Aluminum Finishes

.1 Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.

.2 Factory Finishing:

.1 Kawneer Permanodic® AA-M10C21A44, AAMA 611, Architectural Class I Color Anodic Coating

.2 Kawneer Permanodic® AA-M10C21A41, AAMA 611, Architectural Class I Clear Anodic Coating (Color #14 Clear)

.3 Kawneer Permanodic® AA-M10C21A31, AAMA 611, Architectural Class II Clear Anodic Coating (Color #17 Clear)

.4 Kawneer Permafluor™ (70% PVDF), AAMA 2605, Fluoropolymer Coating.

.5 Kawneer Permadize® (50% PVDF), AAMA 2604, Fluoropolymer Coating.

.6 Kawneer Permacoat™ AAMA 2604, Powder Coating.

.7 Other:

Manufacturer _____ Type _____ Color _____.

3 EXECUTION

3.01 EXAMINATION

.1 Examine openings, substrates, structural support, anchorage, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work. Verify rough opening dimensions, levelness of sill plate and operational clearances. Examine wall flashings, vapor retarders, water and weather barriers, and other built-in components to ensure a coordinated, weather tight window installation.

.1 Masonry Surfaces: Visibly dry and free of excess mortar, sand, and other construction debris.

.2 Wood Frame Walls: Dry, clean, sound, well nailed, free of voids, and without offsets at joints. Ensure that nail heads are driven flush with surfaces in opening and within 3 inches (76.2 mm) of opening.

.3 Metal Surfaces: Dry; clean; free of grease, oil, dirt, rust, corrosion, and welding slag; without sharp edges or offsets at joints.

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

3.02 INSTALLATION

.1 Comply with Drawings, Shop Drawings, and manufacturer's written instructions for installing windows, hardware, accessories, and other components.

.2 Install aluminum framed window system level, plumb, square, true to line, without distortion or impeding thermal movement, anchored securely in place to structural support, and in proper relation to wall flashing and other adjacent construction.

.3 Set sill members in bed of sealant or with gaskets, as indicated, for weather tight construction.

.4 Install aluminum framed window system and components to drain condensation, water penetrating joints, and moisture migrating within system to the exterior.

.5 Separate aluminum from dissimilar materials to prevent corrosion or electrolytic action at points of contact.

3.03 Field Quality Control

.1 Testing Agency: Engage a qualified testing agency to perform tests and inspections and prepare test reports.

.1 Testing and inspecting agency will interpret tests and state in each report whether tested work complies with or deviates from requirements.

.2 Testing Services: Testing and inspecting of installed windows shall take place as follows:

.1 Testing Methodology: Testing Standard shall be per AAMA 502 including reference to ASTM E 783 for Air Infiltration Test and ASTM E 1105 for Water Penetration Test.

.1 Air Infiltration Test: Conduct test in accordance with ASTM E 783 at a minimum uniform static test pressure of 1.57 psf (75 Pa) for CW or 6.24 psf (300 Pa) for AW. The maximum allowable rates of air leakage for field testing shall not exceed 1.5 times the project specifications.

.2 Water Infiltration Test: Water penetration resistance tests shall be conducted in accordance with ASTM E 1105 at a static test pressure equal to 2/3 the specified water test pressure.

.2 Testing Extent: Architect shall select window units to be tested as soon as a representative portion of the project has been installed, glazed, perimeter caulked and cured. Conduct tests for air infiltration and water penetration with manufacturer’s representative present.

.3 Test Reports: Shall be prepared according to AAMA 502.

3.05 ADJUSTING

.1 Adjust operating sashes, screens, hardware, and accessories for a tight fit at contact points and weather stripping for smooth operation and weather tight closure. Lubricate hardware and moving parts.

3.06 CLEANING

.1 Progress Cleaning: Clean frames and glazing in accordance with Section 01 74 00 - Cleaning.

.1 Remove temporary protective material from prefinished aluminum surfaces.

.2 Clean aluminum surfaces promptly after installation. Exercise care to avoid damage to coatings.

.3 Ensure curtain wall drainage system (weeps, drainage holes, channels, etc.) are unobstructed and free of dirt and sealants.

.2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.

.1 Wash exposed surfaces with mild solution of detergent and warm water, using soft, clean wiping cloths. Remove dirt from corners. Wipe surfaces clean.

.2 Clean glass and glazing materials with approved non-abrasive cleaner.

3.07 PROTECTION

.1 Protect installed products and components from damage during construction. Mark glass which may be subject to accidental breakage by Subcontractors. Use temporary markings that after removal do not stain or otherwise leave a perceptible effect.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA):

- .1 ANSI/BHMA A156.1-[2016], Butts and Hinges
- .2 ANSI/BHMA A156.2-[2017], Bored and Preassembled Locks and Latches
- .3 ANSI/BHMA A156.3-[2020], Exit Devices
- .4 ANSI/BHMA A156.4-[2019], Door Controls - Closers
- .5 ANSI/BHMA A156.5-[2020], Cylinders and Input Devices for Locks
- .6 ANSI/BHMA A156.6-[2015], Architectural Door Trim
- .7 ANSI/BHMA A156.8-[2015], Door Controls - Overhead Stops and Holders
- .8 ANSI/BHMA A156.10-[2017], Power Operated Pedestrian Doors
- .9 ANSI/BHMA A156.12-[2018], Interconnected Locks
- .10 ANSI/BHMA A156.13-[2017], Mortise Locks and Latches
- .11 ANSI/BHMA A156.14-[2019], Sliding and Folding Door Hardware
- .12 ANSI/BHMA A156.15-[2015], Release Devices - Closer Holder, Electromagnetic and Electromechanical
- .13 ANSI/BHMA A156.16-[2018], Auxiliary Hardware
- .14 ANSI/BHMA A156.17-[2019], Self Closing Hinges and Pivots
- .15 ANSI/BHMA A156.18-[2020], Materials and Finishes
- .16 ANSI/BHMA A156.19-[2019], Power Assist and Low Energy Power Operated Doors
- .17 ANSI/BHMA A156.20-[2021], Strap and Tee Hinges and Hasps
- .18 ANSI/BHMA A156.21-[2019], Thresholds
- .19 ANSI/BHMA A156.22-[2021], Gasketing
- .20 ANSI/BHMA A156.26-[2021], Continuous Hinges
- .21 ANSI/BHMA A156.28-[2018], Recommended Practices for Mechanical Keying Systems
- .22 ANSI/BHMA A156.29-[2017], Exit Locks, Exit Alarms, Alarms for Exit Devices
- .23 ANSI/BHMA A156.30-[2020], High Security Cylinders
- .24 ANSI/BHMA A156.34-[2019], Bored Locks and Mortise Locks with Ligature Resistant Trim
- .25 ANSI/BHMA A156.36-[2020], Auxiliary Locks

.2 Canadian Steel Door Manufacturers' Association (CSDMA):

- .1 Recommended Dimensional Standards for Commercial Steel Doors and Frames, [2000]

.3 CSA Group (CSA):

- .1 CSA B651-[18], Accessible Design for the Built Environment

.4 Door and Hardware Institute (DHI):

.1 Sequence and Format for the Hardware Schedule, [2019]

.5 National Fire Protection Association (NFPA):

.1 NFPA 80-[2013], Standard for Fire Doors and Other Opening Protectives

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Coordination: Obtain and distribute templates for doors, frames, and other work specified to be factory prepared for installing door hardware. Coordinate with shop drawings or other Sections. Confirm that adequate previsions are made for locating and installing door hardware in accordance with indicated requirements, and as follows:

.1 Coordinate for type of wire required for electrified hardware, schedule for installation, and connection to electrified door hardware.

.2 Coordinate layout and installation of recessed pivots and closers, and cast-in anchoring inserts into floor construction.

.3 Coordinate layout and installation of electrified door hardware with connections to power supplies, fire alarm system and detection devices, access control system, security system and building management system.

.4 Coordinate with electrical Subcontractor for provision of service to each electrical door operator.

.5 Coordinate with electrical Subcontractor for electrical conduit and wiring from specified electrical door controls to door operators.

.6 Coordinate door hardware and electrified operators with drawings.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's product data for each type of door hardware. Include product characteristics, performance criteria, profiles, dimensions, finishes, and limitations.

.3 Shop Drawings: Submit shop drawings indicating details of electrified door hardware including the following:

.1 Detailed interface between electrified door hardware and fire alarm, access control, security, building management system.

.2 Theory of operation for electrified door hardware groups.

.3 Wiring diagrams for power, signal, and control systems. Identify manufacturer-installed wiring and site-installed wiring.

.1 System schematic

.2 Point-to-point wiring diagram

.3 Riser diagram

.4 Elevation of each electrified door.

.4 Samples:

.1 Submit samples of the following hardware items for verification:

.1 cylinders, keys, door gaskets, door sweeps, locks and latches, operating trim.

.2 Identify each sample with a label indicating applicable specification paragraph number, brand name, model number, finish, and hardware schedule group/number.

.3 After approval, samples will not be returned for inclusion into Work.

.5 Source Quality Control Submittals: When requested, submit proof of door hardware schedule consultant's participation in Door and Hardware Institute® (DHI) Continuing Education Program.

.6 Contract Door Hardware Schedule: Submit schedule prepared by or under the supervision of a qualified hardware consultant detailing fabrication and assembly of door hardware.

.1 Comply with DHI Sequence and Format for the Hardware Schedule.

.2 Organize the door hardware schedule into door hardware groups indicating a complete description of every item required for each door (or opening).

.3 Indicate hardware make, model, material, function, handing, size, fastening, and finish using codes in BHMA A156.18, and other pertinent information.

.4 Include keying schedule describing how each locking device is keyed in accordance with ANSI/BHMA A156.28. Index each key type to a specific door number.

.5 Indicate location of each door hardware set, cross-referencing door numbers indicated in the Contract Documents.

.6 Include an explanation of abbreviations, symbols, and alphanumeric codes in contract hardware schedule, where applicable.

.7 Include description of each electrified door hardware function, sequence of operation, and coordinating interface with other systems (e.g., fire alarm).

.8 Include DHI certification stamp on contract door hardware schedule.

.7 Test Reports: When requested, submit certified test reports showing a product's compliance to a specified referenced standard.

.8 Manufacturer's Instructions: Submit manufacturer's installation instructions.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Submit operation and maintenance data for door hardware and incorporate into manual.

.3 Warranty Documentation: Submit manufacturer's material and fabrication warranty.

1.06 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials: Supply maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.1 Tools: Supply two sets of wrenches for door closers, locksets, and fire exit hardware.

1.07 QUALITY ASSURANCE

.1 Qualifications:

.1 Door Hardware Consultant: DHI-certified, including any of the following: Door + Hardware Consultant (DHC), Door + Hardware Specification Consultant (DHSC), or Access Control System Consultant (ACSC)[, or an Architectural Hardware Consultant] [or a Door + Hardware Technician (DHT)].

.2 Installer: Completed door hardware projects similar in scope to this Project with a record of successful in-service performance in the past [[three] [five]] years.

.2 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors: To ANSI/BHMA A156.29, certified by a Canadian Certification Organization accredited by the Standards Council of Canada.

.2 Fire-Rated Door Assemblies: Where fire-rated doors are indicated, provide door hardware complying with NFPA 80 that is listed and labelled by a qualified testing agency for fire-protection ratings indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

.1 Perform in accordance with Section 01 61 00 - Common Product Requirements.

.2 Delivery and Acceptance Requirements: Deliver materials to site in original factory packaging and with manufacturer's labels.

.3 Package hardware items, including fasteners, separately or in groups of related hardware. Protect prefinished surfaces with wrapping, strippable coating, or other protective packaging. Label each package with their contents and location in building.

.4 Storage and Handling Requirements:

.1 Store materials off ground in a dry, well-ventilated indoor location, and in accordance with manufacturer's recommendations.

.2 Store and protect door hardware from scratches and other damages.

2 PRODUCTS

2.01 DOOR HARDWARE

.1 Use products from only one manufacturer for similar items.

.2 Locks and Latches:

.1 Bored and preassembled locks and latches: To ANSI/BHMA A156.2, [series 2000 preassembled lock, grade 1] [series 4000 bored lock, grade [1] [2] [3]], designed for function and keyed as stated in hardware schedule.

.2 Interconnected locks and latches: To ANSI/BHMA A156.12, series 5000 interconnected lock, grade [[1] [2] [3]], designed for function [and keyed] as stated in hardware schedule.

.3 Mortise Locks and Latches: To [ANSI/BHMA A156.13] [ANSI/BHMA A156.34], series 1000 mortise lock, grade [[1] [2] [3] [4]], designed for function [and keyed] as stated in Hardware Schedule.

.4 Lever Handles: Plain designed with antimicrobial coating.

.5 Cylinder Collar (escutcheon): Round

.6 Normal strikes: Box type, lip projection not beyond jamb.

.7 Cylinders: To [ANSI/BHMA A156.5] [ANSI/BHMA A156.30] , key into keying system as directed.

.8 Finishes: To ANSI/BHMA A156.18

.3 Butts and hinges:

.1 Butts and Hinges: To ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in hardware schedule.

.2 Self-closing hinges and pivots: To ANSI/BHMA A156.17, designated by letter N and numeral identifiers listed in hardware schedule

.3 Strap and tee hinges and hasps: To ANSI/BHMA A156.20, designated by letter A and numeral identifiers listed in hardware schedule, size listed in hardware schedule in accordance with ANSI/BHMA A156.20, table I, finished to 602 (cadmium plated or 603 (zinc plated).

.4 Continuous Hinges: To ANSI/BHMA A156.26

.4 Exit Devices: To ANSI/BHMA A156.3, grade [[1] [2]], modern design with antimicrobial coating. Provide ULC-labelled devices at fire-protection rated closures.

.1 Auxiliary item[s]: door coordinator, type 21, for pairs of doors with overlapping astragals.

.5 Door Closers and Accessories:

.1 Door controls (closers): To ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in hardware schedule.

.2 Door controls - overhead holders: To ANSI/BHMA A156.8, designated by letter C and numeral identifiers listed in hardware schedule.

.3 Closer/holder release devices: To ANSI/BHMA A156.15, designated by letter C and numeral identifiers listed in hardware schedule.

.4 Door coordinator: Surface for pairs of doors with overlapping astragal.

.6 Door Operators:

.1 Power-operated pedestrian doors: To ANSI/BHMA A156.10

.2 Power assist and low energy power-operated doors: To ANSI/BHMA A156.19

.7 Auxiliary locks and associated products: To [ANSI/BHMA A156.36] [and] [ANSI/BHMA A156.31], designated by letter E and numeral identifiers listed in hardware schedule.

.1 Latch bolt or Dead bolt. Key into keying system as directed.

.2 Cylinders: for installation in deadlocks provided with special doors as listed in hardware schedule. Key into keying system as directed.

.8 Architectural Door Trim: To ANSI/BHMA A156.6, designated by letter J and numeral identifiers listed in hardware schedule.

.10 Auxiliary hardware: To ANSI/BHMA A156.16, listed in hardware schedule

.11 Door bottom seal: Door seal of extruded aluminum frame and solid closed cell neoprene weather seal, recessed in door bottom with drip cap, closed ends, adjustable, clear anodized finish.

.12 Thresholds: To ANSI/BHMA A156.21 full width of door opening, extruded aluminum mill finish, plain surface, with thermal break of rigid PVC, with lip and vinyl door seal insert.

.13 Weatherstripping: To ANSI/BHMA A156.22, and as follows:

.1 Head and jamb seal:

.1 Extruded aluminum frame and solid closed-cell neoprene insert, clear anodized finish.

.2 Adhesive backed neoprene material.

.2 Door bottom seal:

.1 Extruded aluminum frame and closed-cell neoprene sweep, clear anodized finish.

.14 Astragal: Adjustable extruded aluminum frame with pile insert, finish to match door.

.15 Barrier-Free Pneumatic Door Operator:

.1 Heavy duty pneumatically-assisted door closer, capable of multi-door operation, complete with actuators, control boxes, pneumatic tubing and compressed air source.

.2 Self-contained control box/compressor combination for independent operation of two door leaves.

.3 Control boxes: Complete with electric strike relay.

.4 Mount operators on either push or pull sides of doors as required to place them inside rooms.

.5 Actuation of operators by card readers.

.6 Electrical box and actuator: Hardwired low voltage actuator with stainless steel 114-mm round plate, engraved blue and filled with International Symbol of Access (ISA). 51-mm-wide x 102-mm-high x 50-mm-deep single gang electrical box, flush-mounted in wall at indicated locations.

.7 Supply switched line voltage to control box. Locate switch adjacent to box.

.8 Supply low voltage wiring to each actuator and a [6]-mm diameter air tubing to each operator.

.9 Mount control box in location as directed by HWDSB.

2.02 MISCELLANEOUS HARDWARE

.1 Indexed Key Control System: To ANSI/BHMA A156.5, designated by letter E and numeral identifiers, colour enamel paint finish.

2.03 FASTENINGS

.1 Use only fasteners provided by the manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Match exposed fastening devices to finish of hardware.

.4 Where pull is positioned on one side of the door and push plate on the other side, supply fastening devices, and install to secure pull through the door from the reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with the material they are used in.

2.04 KEYING

.1 Doors, padlocks and cabinet locks to be keyed alike in groups, master keyed as directed. Prepare detailed keying schedule in conjunction with HWDSB.

.2 Provide keys in duplicates for every lock of the Work.

.3 Provide 3 master keys for each master key or grand master key group.

.4 Stamp keying code numbers on keys and cylinders.

3 EXECUTION

3.01 INSTALLATION

.1 Manufacturer's Instructions: Comply with manufacturer's recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Provide metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.3 Provide manufacturers' instructions for proper installation of each hardware component.

.4 Install hardware to standard hardware location dimensions in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames [and CSA B651].

.5 Where door stop comes into contact with door pull, mount stop to strike bottom of pull.

3.02 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to ensure tight fit at contact points with frames.

3.03 CLEANING

.1 Progress Cleaning: Perform in accordance with Section 01 74 00 - Cleaning and as follows:

.1 Remove protective coatings and wrappings from hardware items.

.2 Final Cleaning: Perform in accordance with Section 01 74 00 - Cleaning.

3.04 DEMONSTRATION

.1 Keying System Setup and Cabinet:

.1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index, key change index, label shields, control book and key receipt cards.

.2 Place file keys and duplicate keys in key cabinet on their respective hooks.

.3 Lock key cabinet and provide key to HWDSB.

.2 Maintenance Staff Briefing: Brief maintenance staff regarding the following:

.1 Proper care, cleaning, disinfecting, and general maintenance of hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers, locksets and fire exit hardware.

.3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.05 PROTECTION

.1 Protect installed products and components from damage during construction.

3.06 DOOR HARDWARE SCHEDULE

.1 See Drawings for Door Hardware Schedule. Contractor to provide hardware schedule for HWDSB approval, with review by JASON FUNG ARCHITECT INC.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 American National Standards Institute (ANSI):

- .1 ANSI Z97.1-[2015], Safety Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test

.2 ASTM International (ASTM):

- .1 ASTM C542-[05], Standard Specification for Lock-Strip Gaskets
- .2 ASTM C1503-[18], Standard Specification for Silvered Flat Glass Mirror
- .3 ASTM D790-[17], Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials
- .4 ASTM D1003-[13], Standard Test Method for Haze and Luminous Transmittance of Plastics
- .5 ASTM D1929-[20], Standard Test Method for Determining Ignition Temperature of Plastics
- .6 ASTM D2240-[15e1], Standard Test Method for Rubber Property - Durometer Hardness
- .7 ASTM E84-[20], Standard Test Method for Surface Burning Characteristics of Building Materials
- .8 ASTM E330-[02], Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
- .9 ASTM F1233-[08], Standard Test Method for Security Glazing Materials and Systems

.3 Canadian General Standards Board (CGSB):

- .1 CAN/CGSB-12.1-[2017], Safety Glazing
- .2 CAN/CGSB-12.2-M[91], Flat, Clear Sheet Glass
- .3 CAN/CGSB-12.3-M[91], Flat, Clear Float Glass
- .4 CAN/CGSB-12.4-M[91], Heat Absorbing Glass
- .5 CAN/CGSB-12.6-M[91], Transparent (One-Way) Mirrors
- .6 CAN/CGSB-12.8-[2017], Insulating Glass Units
- .7 CAN/CGSB-12.9-M[91], Spandrel Glass
- .8 CAN/CGSB-12.10-M[76], Glass, Light and Heat Reflecting
- .9 CAN/CGSB-12.12-M[90], Plastic Safety Glazing Sheets
- .10 CAN/CGSB-12.13-M[91], Patterned Glass

.4 CSA Group (CSA):

- .1 CSA A460-[19], Bird-Friendly Building Design

.5 National Glass Association with GANA (NGA):

- .1 GANA Glazing Manual - [2008]
- .2 Laminated Glazing Reference Manual - [2019]

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards:

.1 SCAQMD Rule 1168-[2017], Adhesives and Sealants Applications

.7 UL Canada (UL):

.1 UL 752-[2015], Standard for Bullet-Resisting Equipment

.2 UL 2761-[2011], Sealants and Caulking Compounds

.8 ULC Stamdards (ULC):

.1 CAN/ULC S102-[10], Test for Surface Burning Characteristics of Building Materials and Assemblies

.2 CAN/ULC S104-[10], Standard Method of Fire Tests for Door Assemblies

.3 CAN/ULC S106-[15], Standard Method of Fire Tests of Windows and Glass Block Assemblies

.9 United States Consumer Product Safety Commission (CPSC):

.1 CPSC 16 CFR 1201 – Safety Standard for Architectural Glazing Materials

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings: Convene meeting 1 week before beginning work of this Section and on-site installation, with Contractor, Subcontractor and HWDSB in accordance with Section 01 31 19 - Project Meetings to:

.1 Verify project requirements.

.2 Review installation and substrate conditions.

.3 Coordination with other Subcontractors.

.4 Review manufacturer's written installation instructions and warranty requirements.

.2 Sequencing: Comply with manufacturer's recommendations for sequencing construction operations.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish, and limitations.

.2 Submit WHMIS SDS.

.3 Shop Drawings: Submit drawings stamped and signed by professional engineer registered or licensed in Ontario, Canada.

.4 Samples:

.1 Submit for review and acceptance of each type of unit.

.2 Samples will not be returned for inclusion into Work.

.3 Submit duplicate 300 mm size samples of glass and sealant material.

.4 Submit duplicate manufacturer samples of surface-applied glazing films.

.5 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.6 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.1 Submit testing and analysis of glass under provisions of Section 01 43 00 - Quality Assurance.

.2 Submit shop inspection and testing for glass.

1.05 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Submit maintenance data for glazing and incorporate into manual.

1.06 QUALITY ASSURANCE

.1 Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.2 Mock-ups: Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.

.1 Construct mock-up to include glass glazing.

.2 Mock-up will be used:

.1 To judge quality of work, substrate preparation, and material application.

.3 HWDSB will require minimum 24 hours to review the mock-up.

.4 Approved mock-up may not remain as part of finished Work.

1.07 DELIVERY, STORAGE, AND HANDLING

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

.2 Storage and Handling Requirements:

.1 Store materials off ground, indoors in a clean dry location and in accordance with manufacturer's recommendations.

.2 Store and protect glazing from nicks, scratches, and edge damage.

.3 Protect prefinished aluminum surfaces with wrapping or strippable coating.

.4 Replace defective or damaged materials with new.

1.08 AMBIENT CONDITIONS

.1 Ambient Requirements:

.1 Install glazing when ambient temperature is 10°C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

.3 Refer to manufacturer's instructions for minimum ambient temperature for application of bird deterrent glazing film.

2 PRODUCTS

2.01 MATERIALS

.1 Design Criteria:

.1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:

.2 Utilize inner lite of multiple lite sealed units for continuity of air and vapour seal.

.3 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to design pressure of 8 kPa to ASTM E330.

.4 Limit glass deflection to 1/200 or flexural limit of glass with full recovery of glazing materials.

.5 Exterior glazing design and materials: to CSA Standard A460 for bird-friendly design.

.2 Flat Glass:

.1 Float glass: to CAN/CGSB-12.3, glazing quality, 10 mm thick.

.2 Sheet glass: to CAN/CGSB-12.2, AA-special selected, 10 mm thick.

.3 Safety glass: to CAN/CGSB-12.1, transparent, 10 mm thick.

.1 Type 1-laminated or 2-tempered.

.2 Class B-float.

.3 Category I or II.

.4 Edge treatment.

.4 Spandrel glass: to CAN/CGSB-12.9, 10mm thick.

.1 Type 1-tempered or 2-heat strengthened.

.2 Class A-float.

.3 Style: [1-ceramic] [2-reflective] [3-organic] coated.

.4 Form: [M-monolithic] [I-insulating glass unit] [L-laminated].

.12 Wired glass: to ANSI Z97.1 and CPSC 16 CFR 1201 Cat. I and II, with surface applied safety film.

.1 Thickness: 10 mm.

.2 Wire mesh style: square.

.16 Low emissivity (LOW E) glass, 10 mm thick.

.1 Metallic coating: soft, sputtered.

.2 Light transmittance: to be reviewed with manufacturer

.3 Solar heat gain coefficient (SHGC): to be reviewed with manufacturer

.4 Shading co-efficient: to be reviewed with manufacturer

.5 U-Value: to be reviewed with manufacturer

.3 Insulating Glass Units:

.1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25 mm overall thickness.

.1 Glass: to [CAN/CGSB-12.3] [CAN/CGSB-12.1] [CAN/CGSB-12.2] [CAN/CGSB-12.4] [CAN/CGSB-12.10].

.2 Glass thickness: 10 mm each lite.

.3 Inter-cavity space thickness: 5mm with low conductivity spacers.

.4 Glass coating: surface number 4, low "E"

.5 Inert gas fill: argon or krypton.

.6 Bird deterrent treatment: in accordance with CSA A460, provide glass with bird deterrent patterns of ceramic frit on full area of Surface No. 1 (exterior).

.1 Visual pattern size: minimum of 4 mm diameter for individual elements/dots, and minimum 2 mm wide by 8 mm long for linear elements.

.2 Spacing: no more than 50 mm vertically and horizontally between visual markers or other patterns.

.3 Contrast: dots or other visual marker pattern are to be high contrast between dots and other visual marker pattern to the colour/tint of the glazing material.

.4 Sealant: in accordance with Section 07 92 00 - Joint Sealants.

2.03 ACCESSORIES

.1 Setting blocks: neoprene, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square metre of glazing.

.2 Spacer shims: neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.

.3 Glazing tape:

.1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240.

.2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

.4 Glazing splines: resilient polyvinyl chloride, silicone or EPDM, extruded shape to suit glazing channel retaining slot.

.5 Lock-strip gaskets: to ASTM C542.

.6 Mirror attachment accessories:

.1 Stainless or plated steel, [J-shaped profile], [adjustable], sized to match thickness of mirror.

.2 Plastic rosettes.

.3 Mirror adhesive, chemically compatible with mirror coating and wall substrate.

.4 Mirror frames: [_____].

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: Verify conditions of substrates previously installed are acceptable for beginning glazing installation in accordance with manufacturer's instructions.

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

.3 Visually inspect substrates.

.4 Inform HWDSB of unacceptable conditions immediately upon discovery.

.5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.

3.02 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

.4 Preparation - Glazing films:

.1 Clean glazing before beginning installation using neutral cleaning solution.

.2 Ensure no deleterious material adheres to glazing.

.3 Ensure dust, grease, and chemical residue are removed from surface of glazing before installation of film.

.4 Examine glazing under natural daylight and identify cracks, blisters, bubbles, discolouration, edge defects or other anomalies that may cause film to delaminate or cause vision transparency or distortion problems.

3.03 INSTALLATION: EXTERIOR - DRY METHOD (PREFORMED GLAZING)

.1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.3 Cut glazing [tape] [spline] to length; install on glazing lite. Seal corners by butting tape, spline and sealing junctions with sealant.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

.6 Install removable stops without displacing glazing tape, spline. Exert pressure for full continuous contact.

.7 Trim protruding tape edge.

3.04 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

.3 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against tape and heel head of sealant with sufficient pressure to attain full contact at perimeter of lite or glass unit.

.6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.

.7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9 mm below sight line.

.8 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.05 INSTALLATION: EXTERIOR - WET METHOD (SEALANT AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Place setting blocks at ¼ points and install glazing lite or unit.

.3 Install removable stops with glazing centred in space by inserting spacer shims both sides at 600 mm intervals, 6 mm below sight line.

.4 Fill gaps between glazing and stops with sealant to depth of bite on glazing, maximum 9 mm below sight line to ensure full contact with glazing and continue air and vapour seal.

.5 Apply sealant to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.06 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape for full contact at perimeter of lite or unit.

.5 Place glazing tape on free perimeter of glazing in same manner described.

.6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.7 Knife trim protruding tape.

3.07 INSTALLATION: INTERIOR WET/DRY METHOD (TAPE AND SEALANT)

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Cut glazing tape to length and install against permanent stops, projecting 1.6 mm above sight line.

.3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.4 Rest glazing on setting blocks and push against tape to ensure full contact at perimeter of lite or unit.

.5 Install removable stops, with spacer shims inserted between glazing and applied stops at 600 mm intervals, 6 mm below sight line.

.6 Fill gaps between lite and applied stop with sealant to depth equal to bite on glazing, to uniform and level line.

.7 Trim protruding tape edge.

3.08 INSTALLATION: INTERIOR - WET METHOD COMPOUND AND COMPOUND

.1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

.2 Install glazing resting on setting blocks. Install applied stop and centre lite by use of spacer shims at 600mm centres, 6mm below sight line.

.3 Locate and secure glazing lite using glazers' clips.

.4 Fill gaps between glazing and stops with glazing compound until flush with sight line. Tool surface to straight line.

3.11 INSTALLATION: BIRD-DETERRENT TREATMENT

.1 If there are green roofs or rooftop vegetation adjacent to glazing, follow CSA A460 for specific installation requirements.

.2 Refer to manufacturer's instructions for minimum ambient temperature for application of bird deterrent glazing film.

.3 Bird deterrent treatment to be installed from ground to 16 m or to the height of the adjacent mature tree canopy, whichever is greater.

.4 Bird deterrent treatment to be applied to glass corners for 5 m in each direction.

3.12 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning.

.1 Remove traces of primer and sealants.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels.

.4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.2 Waste Management: Perform in accordance with Section 01 74 19 - Waste Management and Disposal.

3.13 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 After installation, mark each lite with an "X" by using removable plastic tape or paste.

.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing installation.

3.14 SCHEDULE

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 REFERENCE STANDARDS

.1 The Aluminum Association Inc. (AA):

- .1 AA DAF-45-[2003], Designation System for Aluminum Finishes

.2 Air Movement and Control Association International (AMCA):

- .1 AMCA 500-D-[18], Laboratory Methods of Testing Dampers for Rating
- .2 AMCA 500-L-[12], Laboratory Methods of Testing Louvers for Rating
- .3 AMCA 501-[17], Application Manual for Air Louvers
- .4 AMCA 511-[21], Certified Ratings Program for Air Control Devices

.3 American National Standards Institute (ANSI):

- .1 ANSI H35.1/H35.1M-[17], Alloy and Temper Designation Systems for Aluminum

.4 ASTM International (ASTM):

- .1 ASTM A240/A240M-[20A], Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications
- .2 ASTM A653/A653 M-[13], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .3 ASTM A1008/A1008M-[13], Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened and Bake Hardenable
- .4 ASTM B32-[20], Standard Specification for Solder Metal
- .5 ASTM B209/B209M-[21a], Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- .6 ASTM B221M-[21], Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
- .7 ASTM B370-[12], Standard Specification for Copper Sheet and Strip for Building Construction
- .8 ASTM D523-[14], Standard Test Method for Specular Gloss
- .9 ASTM D822/D822M-[13], Standard Practice for Filtered Open-Flame Carbon-Arc Exposure of Paint and Related Coatings
- .10 ASTM E2886/E2886M-[20], Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Direct Flame Impingement

.5 Canadian General Standards Board (CGSB):

- .1 CAN/CGSB-1.213-2004, Etch Primer (Pretreatment Coating of Tie Coat) for Steel and Aluminum
- .2 CAN/CGSB-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential

.6 Public Services and Procurement Canada (PSPC)/ Public Works and Government Services Canada (PWGSC):

- .1 MD 15000-[2012], Mechanical Environmental Standard for Federal Office Buildings

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finishes, and limitations.

.2 Submit WHMIS SDS - Safety Data Sheets.

.3 Shop Drawings: Indicate fabrication and erection details, including anchorage, accessories, and finishes.

.4 Samples:

.1 Submit duplicate samples of each type of louvre and vent showing colour and finish.

.2 Show frame detail, screening and finish.

.3 Where colour is not indicated, submit manufacturer's standard colours on actual metal substrate for HWDSB's selection.

.5 Manufacturer Instructions: Submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.

.6 Closeout Submittals: Submit operation and maintenance data for manually operated or motorized louvres and incorporate into manual specified in Section 01 78 00 - Closeout Submittals.

1.04 DELIVERY, STORAGE, AND HANDLING

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Protect louvres from nicks, scratches, and blemishes.

2 PRODUCTS

2.01 MATERIALS

.1 Weather resistant louvres, with bird screens made to withstand a wind load of not less than 1.44 kilopascals.

.2 Wall louvers: complete with AMCA certified ratings program seal for air performance and water penetration in accordance with [AMCA 500-D] [AMCA 500-L] [and] [AMCA 511].

.3 Ratings to indicate water penetration of [0.06] kilograms or less per square metre of free area at free velocity of [244] meters per minute.

.4 Galvanized steel sheet: commercial quality to ASTM A653/A653M with Z275 zinc coating.

.5 Steel sheet: commercial quality to ASTM A1008/A1008M with Class 1 matte finish.

.6 Aluminum sheet: to [ASTM B209/B209M] [ANSI H35.1/H35.1M], [alloy [3003] [5005] with temper as required for forming] mill finish [plain] [embossed [_____] pattern] utility sheet.

.7 Aluminum extrusions: to [AA DAF-45] [[ANSI H35.1/H35.1M] [_____]AA6063-T5] [ASTM B221M alloy 6063-[T5] [T52]].

.8 Copper sheet: to ASTM B370 cold rolled weighing [_____] g/m^2.

.9 Stainless steel sheet: to ASTM A240/A240M, type [302] [304] [316] with [_____] finish.

.10 Fibreglass: [_____].

.11 Solder: to ASTM B32, [50%] tin and [50%] lead.

.12 Flux: suitable for materials to be soldered.

.13 Nails and fasteners: same material as fabricated items.

.14 Gaskets: vinyl.

.15 Primer: to [[CAN/CGSB-1.213] for [copper] [aluminum]] [_____] surfaces.

.16 Prefinished steel sheet:

.1 Prefinished steel with factory applied polyvinylidene fluoride.

.1 Class [F1S] [F2S].

.2 [_____] colour [selected by [Departmental Representative] [DCC Representative] [Consultant] from manufacturer's standard range].

.3 Specular gloss: [30] units +/- in accordance with ASTM D523.

.4 Coating thickness: not less than [22] micrometres.

.5 Resistance to accelerated weathering for chalk rating of [8], colour fade [5] units or less and erosion rate less than [20]% to ASTM D822/D822M as follows:

.1 Outdoor exposure period [2500] hours.

.2 Humidity resistance exposure period [5000] hours.

.2 Prefinished steel with factory applied polyvinyl chloride.

.1 Class [F1S] [F2S].

.2 [_____] colour [selected by [Departmental Representative] [DCC Representative] [Consultant] from manufacturer's standard range].

.3 Specular gloss: [30] units +/-5 in accordance with ASTM D523.

.4 Coating thickness: not less than [200] micrometres.

.5 Resistance to accelerated weathering for chalk rating of [8], colour fade [5] units or less and erosion rate less than [20]% to ASTM D822/D822M as follows.

.1 Outdoor exposure period [5000] hours.

.2 Humidity resistance exposure period [5000] hours.

.3 Prefinished steel with factory applied silicone modified polyester.

.1 Class [F1S] [F2S].

.2 [_____] colour [selected by [Departmental Representative] [DCC Representative] [Consultant] from manufacturer's standard range].

.3 Specular gloss: [30] units +/-5 in accordance with ASTM D523.

.4 Coating thickness: not less than [25] micrometres.

.5 Resistance to accelerated weathering for chalk rating of [8], colour fade [5] units or less and erosion rate less than [20]% to ASTM D822/D822M as follows:

.1 Outdoor exposure period [500] [1000] hours.

.2 Humidity resistance exposure period [500] [1000] hours.

.17 Prefinished aluminum sheet:

.1 Finish aluminum sheet metal with factory applied coating to CAN 2-93.1 amended as follows:

.1 Type [1] [2].

.2 Class [F1S] [F2S].

.3 [_____] colour [selected by [Departmental Representative] [DCC Representative] [Consultant] from manufacturer's standard range].

.4 Specular gloss: [_____] units.

.5 Coating thickness: not less than [_____] micrometres.

.6 Outdoor exposure period [_____] years.

.7 Exposure period for humidity resistance [_____] hours.

.8 Exposure period for salt spray resistance [_____] hours.

.18 Screens:

.1 Insect screens: [minimum 0.3 mm diameter aluminum wire] [fibreglass] 18 x 14 mesh, minimum 60% free area, secured to aluminum frame.

.2 Birdscreens: [crimped] [intercrimped] aluminum wire cloth secured to minimum [2.0] [2.2] mm thick extruded aluminum frame mitered at corners and secured with corner locks, [_____] size mesh, minimum [_____] diameter wire with minimum [_____]% free area.

.19 Formed sheet metal louvres:

.1 Fabricate [_____] sheet metal louvres from minimum [_____] thick stock.

.2 Form blades, mullions and frames to sizes and shapes indicated.

.3 Provide concealed vertical stiffeners spaced to meet required loads.

.4 Complete louvre assembly to have [_____]% free area.

.5 Apply one coat of shop primer.

.6 Attach [bird] [insect] screen to [inside] face of louvre.

.20 Extruded aluminum louvres:

.1 Construct louvres from aluminum extrusions of minimum 3 mm thickness to sizes and shapes indicated.

.2 Arrange blades, mullions and frame extrusions as indicated.

.3 Install concealed vertical stiffeners spaced to meet required loads.

.4 Complete louvre assembly to have minimum [_____]% free area.

.21 Adjustable louvres:

.1 Construct manually adjustable louvres from aluminum extrusions of minimum 3 mm thickness.

.2 Arrange blades, mullions and frame extrusions as indicated.

.3 Center pivot [stormproof type] blades with two reinforcing bosses with pinions operating in self-lubricating nylon bearings.

.4 Arrange blades to be operated by [concealed] drive arms at each jamb connect drive arms by torsion bars operating in nylon bearings.

.5 Equip louvre blades and sills with vinyl gasket weather seals. [[mechanically fasten] [adhere] vinyl gaskets to ends of louvre blades to provide jamb weather seal].

.6 Complete louvre assembly to have minimum [_____]% free area when in open position.

.7 Provide louvres with manual hand crank operator with removable crank located at [_____].

.22 Door louvres:

.1 Construct door louvres from aluminum extrusions

.1 Minimum free area of 35%.

.2 Provide fasteners to suit louvre material.

.2 Use standard operating blades.

.3 Provide separate adjustable trim member for clamping louvre in opening.

.4 Miter frame and trim members at corners and secure rigidly with corner brackets.

.5 Secure interior frame with countersunk tamperproof screws.

.23 Louvred penthouses:

.1 Construct penthouse louvres from extruded aluminum stormproof blades of minimum 3 mm thickness.

.2 Continuously Heliarc weld at corners sills, blades and head members: support by structural aluminum angles on interior as indicated.

.3 Provide one piece weatherproof roof of 2 mm thick aluminum sheet reinforced with 50 x 50 x 6 mm aluminum angles at 1200 mm on centre.

.1 Insulate underside of roof with minimum 6 mm thick sound deadening and anti-condensation coating.

2.02 FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with [AA DAF-45] [ANSI H35.1/H35.1M] for Aluminum Finishes.

.1 As fabricated or mill finish: To AA DAF-45

.2 Clear anodic finish: To AA DAF-45

.3 Integral colour anodic finish: To AA DAF-45, colour to match HWDSB sample.

.4 Impregnated colour anodic finish: designation AA DAF-, colour to match HWDSB sample.

.5 Electrolytically deposited colour anodic finish: designation AA DAF-45, colour to match HWDSB sample.

.2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

3 EXECUTION

3.01 INSTALLATION

.1 Install louvres and vents where indicated.

.2 Set adjustable louvre blades for uniform alignment in open and closed positions.

.3 Adjust louvres so moving parts operate smoothly.

.4 Attach bird and insect screen to inside face of louvre or vent.

.5 Repair damage to louvres and vents to match original finish.

.6 Install wall louvers using stops, mouldings, flanges, strap anchors, jamb fasteners as appropriate for wall construction and in accordance with manufacturer's recommendations.

.7 Install louvers in wood doors by using metal ["Z"] ["L"] mouldings.

.1 Fasten mouldings to door with screws.

3.02 CLEANING

.1 Proceed in accordance with Section 01 74 00 - Cleaning.

3.03 PROTECTION

.1 Paint copper or copper-bearing alloys in contact with dissimilar metal with heavy-bodied bituminous paint or separate with inert membrane.

.2 Where aluminum contacts metal other than zinc, paint dissimilar metal with primer and two coats of aluminum paint.

.3 Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

.4 Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or coat of heavy-bodied bituminous paint.

3.04 SCHEDULE

END OF SECTION

GENERAL

1.01 RELATED REQUIREMENTS

1.02 DEFINITIONS

.1 Gloss Levels: sheen rating of applied paint, coating, or stain with the following values:

Gloss Level Rating	Units @ 60 Degrees	Units @ 85 Degrees
G1 - matte finish	0 to 5	maximum 10
G2 - velvet finish	maximum 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	minimum 35
G5 - semi-gloss finish	35 to 70	-
G6 - gloss finish	70 to 85	-
G7 - high gloss finish	More than 85	-

.2 MPI Degree of Surface Deterioration (DSD) ratings and descriptions are as follows:

DSD Rating	Surface Description
DSD-0	Sound Surface (includes visual (aesthetic) defects that do not affect film's protective properties).
DSD-1	Slightly Deteriorated Surface (indicating fading, gloss reduction, slight surface contamination, minor pin holes, and scratches).
DSD-2	Moderately Deteriorated Surface (small areas of peeling, flaking, slight cracking, and staining).
DSD-3	Severely Deteriorated Surface (heavy peeling, flaking, cracking, checking, scratches, scuffs, abrasion, small holes and gouges).
DSD-4	Substrate Damage (repair or replacement of surface required).

1.03 REFERENCE STANDARDS

.1 ASTM International (ASTM):

.1 ASTM F1869- [23], Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

.2 ASTM F2170- [19a], Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

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

.1 Safety Data Sheets (SDS)

.3 South Coast Air Quality Management District (SCAQMD):

.1 SCAQMD Rule 1113- [2016], Architectural Coatings

.4 The Association for Materials Protection and Performance (AMPP):

.1 SSPC QP9- [2014], Standard Procedure for Evaluating the Qualifications of Commercial Painting and Coating Contractors

.5 The Master Painters Institute (MPI):

.1 MPI Maintenance Repainting Manual, [current edition]

.2 MPI Approved Products List, [current edition]

.3 MPI Green Performance Standard GPS-1, [current edition]

.4 MPI Green Performance Standard GPS-2, [current edition]

.5 MPI Green Performance Standard GPS-3, [current edition]

.6 United States Environmental Protection Agency (EPA):

.1 Method 24—Determination of Volatile Matter Content, Water Content, Density, Volume Solids, and Weight Solids of Surface Coatings [2020]

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Preconstruction Meetings: Arrange a meeting in accordance with Section 01 31 19 – Project Meetings with Contractor, impacted Subcontractors, and HWDSB to confirm degree of surface deterioration (DSD) of existing substrates.

.1 Discuss corrective action for DSD-4 surfaces, if occurring.

.2 Identify rooms or areas where it's unavoidable for painting to occur after installation of porous finish materials, and demonstrate how painting activities will be modified during the mock-up.

.2 Sequencing:

.1 Perform painting before installation of porous finish materials, such as acoustic ceiling panels/tiles.

.3 Scheduling: Schedule painting to prevent disruption to other Subcontractors [and to occupants in building].

.1 Schedule painting activities to ensure painted surfaces have sufficiently cured before occupants move back into each construction stage area. Refer to Section 01 11 00 – Summary of Work, 01 14 00 – Work Restrictions for coordination with staged construction and dates.

.2 Apply paint in occupied facilities after regular office hours, except in unoccupied rooms or areas. Schedule painting activities with approval from HWDSB to ensure painted surfaces have dried and cured sufficiently before occupants move back in.

.3 Obtain written acceptance from HWDSB before changing work schedule.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data: Submit manufacturer's product data for each primer, paint, and coating.

.1 Submit WHMIS SDS - Safety Data Sheets for primers, paints, coatings, and similar materials.

.3 Samples:

.1 Samples for Initial Selection: Submit full range of colour sample chips with gloss levels for HWDSB 's initial selection.

.2 Samples for Verification: Submit samples for review and acceptance of each specified paint and coating type.

.4 Manufacturers' Instructions: Submit manufacturer's application and thinning instructions for each

paint and coating.

.5 Special Procedure Submittals:

.1 Submit schedule a minimum five days before beginning work of this Section.

.7 Qualification Statements:

.1 Submit a list of Subcontractor's three similar projects occurring within the period specified in Part 1 QUALITY ASSURANCE of this Section, including project name and location, and project's design professional.

.2 Submit evidence that paint applicators are qualified as specified in Part 1 QUALITY ASSURANCE of this Section.

.3 Submit purchase orders, invoices and other documents to prove conformance with MPI Approved Product List, when requested by HWDSB.

1.06 CLOSEOUT SUBMITTALS

.1 Submit in accordance with Section 01 78 00 - Closeout Submittals and incorporate into manual.

.1 Record Documentation: Submit record of products applied. List products in relation to each painting/coating finish system, and include the following:

.1 Manufacturer's product name, type, and room/location in the Project

.2 Manufacturer's product number

.3 Manufacturer's colour code number(s)

.4 MPI Environmentally Friendly classification system rating, where applicable

.5 Manufacturer's Safety Data Sheets (SDS)

1.07 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials: Submit in accordance with Section 01 78 00 - Closeout Submittals .

.1 Submit one 4 litre can of each type and colour finish coating. Identify type and colour in relation to the Finish Schedule.

1.08 QUALITY ASSURANCE

.1 Qualifications:

.1 Subcontractor: Minimum five years proven satisfactory painting with experience in similar projects.

.2 Paint Applicators: Qualified journeypersons as defined by local jurisdiction.

.3 Apprentices: May be employed when working under direct supervision of qualified journeyperson in accordance with applicable trade regulations.

.2 Conform to current MPI Maintenance Repainting Manual for interior repainting, including preparation, priming, and cleaning.

.3 Materials, such as primers, paints, coatings, varnishes, stains, lacquers, fillers, thinners and solvents: Listed in the MPI Approved Products List, and from a single manufacturer for each system.

.4 Materials, such as linseed oil, shellac, reducers, and turpentine: Listed in MPI Approved Products List and compatible with existing paints or coatings.

.5 Mock-ups: Construct a mock-up in accordance with Section 01 43 00 - Quality Assurance. Mock-up

will be reviewed for the qualities of non-conforming work as described in Part 3.

.1 Prepare and repaint mock-up designated interior room, surface, or item to specified requirements with specified paint or coating showing selected colours, gloss levels, textures, and quality of work for review and acceptance.

.2 Construct a mock-up on the following existing interior surfaces.

1.09 DELIVERY, STORAGE, AND HANDLING

.1 Perform in accordance with Section 01 61 00 - Common Product Requirements, and:

.1 Deliver and store materials in original containers.

.2 Labels to indicate:

.1 Manufacturer's name and address.

.2 Type of paint or coating.

.3 Compliance with applicable standard.

.4 Colour number in accordance with existing interior colour.

.3 Remove damaged, contaminated, opened, and rejected materials from site.

.4 Store materials and equipment in secure, dry, well-ventilated area with temperature range between 7°C to 30°C. Store materials and supplies away from heat generating devices. Store products sensitive to freezing above the manufacturer's recommended minimum temperature. Close and tightly seal partly used containers of materials.

.5 Keep areas used for temporary storage, cleaning, and preparation clean and orderly.

.6 Remove only the required amount of paint materials to be used that same day from temporary storage.

.7 Comply with requirements of WHMIS regarding use, handling storage, and disposal of hazardous materials.

.8 Fire Safety Requirements:

.1 Provide one temporary 9 kg Type ABC dry chemical portable fire extinguisher adjacent to each storage area.

.2 Handle, store, and use flammable and combustible materials in accordance with National Fire Code of Canada (NFC).

1.10 SITE CONDITIONS

.1 Heating, Ventilation, and Lighting:

.1 Do not perform repainting work unless adequate and continuous ventilation and sufficient heating or cooling facilities are in place to maintain acceptable ambient air and substrate temperatures 24 hours before, during, and after paint application until paint has cured sufficiently.

.2 Ventilate enclosed spaces in accordance with Section 01 51 00 – Temporary Utilities. Where required, provide continuous ventilation for [seven] days after application of paint.

.3 Coordinate use of existing ventilation system with HWDSB and maintain continuous operation during and after application of paint as required.

.4 Provide temporary ventilating and heating equipment where permanent facilities are not available or provide supplemental ventilating and heating equipment if ventilation and

heating from existing system is inadequate to meet minimum requirements. Use of gas-fired appliances is not permitted.

.5 Maintain a minimum lighting level of 323 Lux on surfaces during painting activities. Provide additional temporary lighting when required.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless written acceptance is given by HWDSB and paint manufacturer, do not perform repainting work when

.1 ambient air and substrate temperatures are below 10°C,

.2 substrate temperature is over 32°C, unless paint is formulated for application at high temperatures, or

.3 ambient relative humidity is above 45%.

.2 Do not perform repainting work when maximum moisture content of substrate exceeds

.1 12% for concrete and masonry (clay and concrete brick/block),

.2 15% for wood, and

.3 12% for plaster and gypsum board.

.3 Surface and Ambient Conditions:

.1 Apply paint in areas where dust is no longer being generated by construction activity or when ventilation conditions are such that airborne particles will not affect quality of finished surfaces.

.2 Apply paint to adequately prepared surfaces and to surfaces within specified moisture limits.

.3 Apply paint when previous coat of paint is dry or adequately cured, unless otherwise pre-approved by paint manufacturer.

2 PRODUCTS

2.01 SUSTAINABILITY CHARACTERISTICS

.1 Recycled Content: 50% secondary and post-consumer content.

.2 Paints and Coatings: Meeting MPI "Environmentally Friendly" E1 rating.

.3 Paints and Coatings: Not formulated or manufactured with formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavalent chromium, or their compounds.

.4 Paints, Coatings, Thinners, Solvents, Cleaners, and Related Fluids:

.1 Not containing methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.2 Manufactured without compounds, which contribute to ozone depletion in the upper atmosphere.

.3 Manufactured without compounds, which contribute to smog in the lower atmosphere.

.4 Manufactured where matter generating biochemical oxygen demand (BOD) in undiluted production plant effluent discharged to natural watercourse or a sewage treatment facility lacking secondary treatment does not exceed 15mg/L.

.5 Manufactured where total suspended solids (TSS) content in undiluted production plant effluent discharged to natural watercourse or sewage treatment facility lacking secondary treatment does not exceed 15mg/L.

2.02 MATERIALS

.1 Paint Materials: Listed in MPI Approved Product List (APL), and products from a single manufacturer for each painting system.

.2 Slip Resistant Additives (SRA): Rubber aggregate, clean and washed silica sand, or ground walnut chips, in uniform size, for use with or as a component of paint on interior horizontal surfaces to provide slip resistance.

2.03 COLOURS

.1 Colours: As indicated in Finish Schedule.

.2 HWDSB will provide colour schedule after Contract award. Colour schedule will be based upon selection of five base colours and three accent colours. No more than eight colours will be selected for entire project and no more than three colours will be selected in each area.

.3 Selection of colours will be from manufacturer's full range of colours.

.4 Where specific products are manufactured in a limited range of colours, selection will be based on limited range.

.5 Tint the first coat of two-coat repaint systems a slightly lighter colour than top coat to show a visible difference between coats.

2.04 MIXING AND TINTING

.1 Perform colour tinting operations before delivery of paint to site. On-site tinting of painting materials is allowed with HWDSB's written acceptance.

.2 Mix paste, powder, and catalyzed paint mixes in accordance with manufacturer's instructions.

.3 Where thinner is used, addition not to exceed paint manufacturer's recommendations. Do not use kerosene or such organic solvents to thin water-based paints.

.4 Thin paint for spraying in accordance with paint manufacturer's instructions. If directions are not on container, obtain written instructions from manufacturer.

.5 Re-mix paint in containers before and during paint application to prevent lumps from forming, to mix settled pigments, and to mix chemical components.

2.05 GLOSS/SHEEN RATINGS

.1 Gloss level ratings of repainted surfaces as indicated in Finish Schedule.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: Perform in accordance with Section 01 71 00 – Examination and Preparation.

.1 Interior repainting work will be inspected by a MPI Accredited Paint Inspection Agency acceptable to HWDSB and local MPI Accredited Quality Assurance Association.

.2 Inspect interior surfaces with painting Subcontractor . Notify HWDSB in writing of defects and problems, before beginning repainting work, or after surface preparation is complete if previously undiscovered substrate problems are subsequently discovered.

.3 Assess degree of surface deterioration (DSD) using MPI Maintenance Repainting Manual, specifically the PI Identifiers – Defects and Failures, and the MPI Interior Repaint Assessment.

.4 Where an initially assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is subsequently revealed to be DSD-4 after substrate preparation, repair those unforeseen defects before applying paint. If DSD-4 repairs are required, discuss adjustment to Contract Amount and Contract Time with HWDSB before performing repairs.

.5 Where "special" repainting or recoating system applications (e.g., non-MPI listed products or systems) are required, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application including on site supervision, inspection and approval of their paint or coating system application at no change in Contract Amount or Contract time.

.2 Pre-Application Testing:

.1 Perform moisture tests on substrates using properly calibrated electronic moisture meter, except perform tests on concrete floors to ASTM F1869, ASTM F2170 using simple "cover patch test", and report findings to HWDSB.

.2 Perform testing on existing painted concrete, masonry and plaster surfaces for alkalinity.

.3 Maximum moisture content not to exceed paint/coating manufacturer's recommendations.

3.02 PREPARATION

.1 Protection of In-Place Conditions:

.1 Protect existing surfaces and adjacent fixtures and furnishings from paint splatters, markings, and other damage by suitable non-staining covers or masking.

.2 Protect items that are permanently attached, such as fire rating labels on doors and door frames.

.3 Protect factory finished products and equipment.

.4 Remove and temporarily place in storage electrical cover plates, light fixtures, surface hardware on doors, toilet and bath accessories, and surface mounted equipment, fittings and fastenings before beginning re-painting.

.5 Furniture Handling: Move and temporarily cover furniture and portable equipment as necessary to perform repainting. Move furniture to original locations as painting activities progress. Owner will move furniture upon request as necessary to allow repainting to occur.

.6 As repainting activities progress, place temporary "WET PAINT" signs in occupied areas.

.2 Surface Preparation:

.1 Prepare substrates in accordance with MPI Maintenance Repainting Manual except where specifications are more stringent.

.2 Clean and prepare interior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements, and:

.1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry clean cloths, or compressed air.

.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean

warm water using stiff bristle brush to remove dirt, oils, and surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and to dry thoroughly. Allow sufficient drying time and test surfaces using an electronic moisture meter before commencing work.

.5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water-based paints.

.6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.3 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing and vacuum cleaning as required.

.4 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pre-treatment as soon as possible after cleaning and before deterioration occurs.

.5 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance of up to 1000 mm.

3.03 APPLICATION

.1 Do not begin applying paint until prepared surfaces have been reviewed and accepted by HWDSB.

.2 Apply paints in accordance with MPI Maintenance Repainting Manual, and with each paint manufacturer's instructions, except where specifications are more stringent.

.3 Apply paint by method that is best suited for substrate being repainted using brush and roller. Conform to manufacturer's application instructions except where this Section has more stringent requirements.

.4 Keep work area free from unnecessary accumulation of tools, equipment, surplus materials, and debris.

.5 Brush and Roller Application:

.1 Apply paint in uniform layer using brush or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible by brush using spray, daubers and sheepskins. Paint surfaces and corners not accessible by roller using brush, daubers or sheepskins.

.4 Brush and roll out runs and sags, and overlap marks. Rolled surfaces should be free of roller tracking and heavy stipple.

.5 Remove runs, sags and brush marks from finished work and repaint.

.6 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and with HWDSB's prior written acceptance.

.7 Apply paint coats in continuous manner and allow surfaces to dry and properly cure between coats for the minimum time period recommended by each manufacturer. Minimum dry film thickness of each coat not less than that recommended by manufacturer. Repaint thin spots and bare areas before applying next coat of paint.

.8 Sand and dust between coats to remove visible defects.

.9 Repaint surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as tops of interior cupboards and cabinets and projecting ledges.

.10 Repaint vertical edges, top edges, and bottom edges of doors to be repainted. Do not paint over fire rated labels.

.11 Repaint closets and alcoves.

3.04 PAINTING OF MECHANICAL AND ELECTRICAL EQUIPMENT

.1 Repaint previously painted mechanical and electrical equipment and components exposed to view including panels, conduits, piping, hangers, and ductwork.

.2 Touch-up scratches and marks and repaint mechanical and electrical equipment and components with colour, and gloss finish to match existing.

.3 Do not paint over name plates or instruction labels.

.4 Do not paint sprinkler heads. Completely protect from paint splatters and overspray. Remove protection after painting.

.5 Do not paint interior transformers and substation equipment.

3.05 RE-INSTALLATION

.1 Clean and re-install electrical cover plates, light fixtures, surface hardware on doors, toilet and bath accessories, and surface mounted equipment, fittings and fastenings items that were removed and stored before beginning painting.

.2 Remove temporary protective coverings and warning signs as soon as practical after painting is complete.

3.06 SITE QUALITY CONTROL

.1 Site Tests and Inspections: HWDSB and JASON FUNG ARCHITECT INC. will perform periodic site reviews.

.1 Advise HWDSB when each surface and applied coating is ready for review or inspection. Do not proceed with subsequent coats until previous coat has been reviewed and accepted.

.2 Cooperate with HWDSB and JASON FUNG ARCHITECT INC. and allow access to areas of work.

.2 Non-conforming Work: When repainted surfaces are viewed using sunlight at mid-day and building's light fixtures:

.1 Vertical surfaces are without visible defects from a distance of 1000 mm at 90 degrees to the surface.

.2 Horizontal surfaces are without visible defects from distance of 1000 mm at 45 degrees to the surface.

.3 Ceiling surfaces are without visible defects from floor at 45 degrees to the surface.

.4 Final coat with uniform colour and gloss across full surface area.

3.07 CLEANING

.1 Perform in accordance with Section 01 74 00 - Cleaning, and:

.1 Remove paint where spilled, splashed, splattered, or sprayed as work progresses using means and materials that are not detrimental to affected surfaces or finishes. Restore surfaces to existing condition before painting.

.2 Remove paint splashings on affected exposed surfaces. Remove smears and spatter immediately as operations progress, using compatible solvent. Restore surfaces to existing condition before painting.

.3 Clean equipment and dispose of wash water used for waterborne materials, solvents used for oil-based materials as well as other cleaning and protective materials (such as rags, drop cloths, and masking papers), paints, thinners, paint removers and strippers in accordance with safety requirements of authorities having jurisdiction (AHJ).

.4 Clean painting equipment in leak-proof containers that will permit particulate matter to settle out and be collected. Recycle or dispose of sediment remaining from cleaning operations in manner acceptable to AHJ.

.5 Waste Management: Perform in accordance with Section 01 74 19 – Waste Management and Disposal, and:

.1 Take every precaution necessary to prevent spontaneous combustion.

.2 Store solvent-soaked rags, oily rags, combustible waste, empty containers, and materials subject to spontaneous combustion in ULC approved, sealed containers and in accordance with National Fire Code of Canada. Remove from Project site daily. Safely dispose in accordance with requirements of AHJ.

.3 Allow empty paint containers to dry before disposal.

.4 Protect surplus uncontaminated paints, coatings, and similar materials. Deliver to or arrange collection by others for re-use or re-manufacturing.

.5 Where paint recycling facilities are available, collect surplus paint by type, and deliver to a recycling facility. Surplus paints and coatings may be submitted as part of the MAINTENANCE MATERIAL SUBMITTALS.

.6 Place waste materials defined as hazardous or toxic on the SDS, including used containers in hazardous waste containers or areas designated for hazardous waste.

.7 Prevent contaminants from entering waterways, sanitary and storm drain systems, or into the ground.

.1 For water-based paints and coatings retain the cleaning water and allow sediments to settle then filter out. Do not clean equipment using free draining water.

.2 Retain cleaners, thinners, solvents, and surplus paints. Place in designated containers and properly dispose.

3.08 PROTECTION

.1 Protect freshly repainted surfaces from paint droppings and dust.

.2 Avoid scuffing recently applied paint.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 DEFINITIONS

.1 Application Specialist: An individual who performs surface preparation and application of protective coatings and linings to steel and concrete surfaces of complex industrial structures.

1.03 REFERENCE STANDARDS

.1 Environmental Protection Agency (EPA)

- .1 Test Method for Measuring Total Volatile Organic Compound Content of Consumer Products, EPA Method 24 - Surface Coatings.
- .2 SW-846, Test Method for Evaluating Solid Waste, Physical/Chemical Methods.

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

- .1 Safety Data Sheets (SDS).

.3 Master Painters Institute (MPI)

- .1 Architectural Painting Specification Manual - [current edition].
- .2 Standard GPS-1- [12], MPI Green Performance Standard.
- .3 Standard GPS-2- [12], MPI Green Performance Standard.

.4 National Research Council Canada (NRC)

- .1 National Fire Code of Canada [2015] (NFC).

.5 Society for Protective Coatings (SSPC)

- .1 Systems and Specifications, SSPC Painting Manual [2011].

.6 NACE International

- .1 ANSI/NACE No. 13/SSPC-ACS-1- [2016] -SG, Industrial Coating and Lining Application Specialist Qualification and Certification

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Scheduling

- .1 Provide work schedule for various stages of painting to HWDSB for approval. Provide schedule minimum of 48 hours in advance of proposed operations.
- .2 Obtain written authorization from HWDSB for changes in work schedule.
- .3 Schedule new additions to existing building coordinate painting operations with other trades.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

- .1 Provide manufacturer's instructions, printed product literature and data sheets for paint and paint products and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit 2 copies of WHMIS SDS in accordance with Section 01 35 29.06 - Health and Safety Requirements, 01 35 43 - Environmental Procedures.

.3 Confirm products to be used are in MPI's approved product list.

.4 Upon completion, provide records of products used. List products in relation to finish system and include the following:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour number [s].

.4 MPI Environmentally Friendly classification system rating.

.5 Manufacturer's Safety Data Sheets (SDS).

.3 Samples:

.1 Provide 200 x 300 mm sample panels of each paint, clear coating and special finish with specified paint or coating in colours, gloss/sheen and textures required to MPI Architectural Painting Specification Manual standards submitted on following substrate materials:

.1 3 mm plate steel for finishes over metal surfaces.

.2 13 mm birch plywood for finishes over wood surfaces.

.3 50 mm concrete block for finishes over concrete or concrete masonry surfaces.

.4 13 mm gypsum board for finishes over gypsum board and other smooth surfaces.

.5 10 mm plywood for finishes over wood surfaces.

.2 When approved, samples shall become acceptable standard of quality for appropriate on-site surface with one of each sample retained on-site.

.3 Provide full range of available colours where colour availability is restricted.

.4 Sustainable Design Submittals:

.1 Construction Waste Management:

.1 Provide project Waste Management Plan highlighting recycling and salvage requirements.

.2 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates demonstrating that 50% of construction wastes were recycled or salvaged.

.2 Recycled Content:

.1 Provide listing of recycled content products used, including details of required percentages or recycled content materials and products, showing their costs and percentages of post-consumer and post-industrial content, and total cost of materials for project.

.4 Regional Materials: Provide evidence that project incorporates required percentage 10% of regional materials and products, showing their cost, distance from project to furthest site of extraction or manufacture, and total cost of materials for project.

.5 Low-Emitting Materials:

.1 Provide listing of adhesives and sealants and paints and coatings used in building, showing compliance with VOC and chemical component limits or restriction requirements.

.5 Certificates:

.1 Submit certifications for Application Specialists to demonstrate compliance to the

requirements of ANSI/NACE No.13.

1.06 CLOSEOUT SUBMITTALS

.1 Provide in accordance with Section 01 78 00 - Closeout Submittals.

.2 Operation and Maintenance Data: Provide operation and maintenance data for painting materials for incorporation into manual.

.3 Include:

.1 Product name, type and use.

.2 Manufacturer's product number.

.3 Colour number [s].

.4 MPI Environmentally Friendly classification system rating.

1.07 MAINTENANCE MATERIAL SUBMITTALS

.1 Extra Stock Materials:

.1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.

.2 Submit one(1) four litre can of each type and colour of primer, finish coating. Identify colour and paint type in relation to established colour schedule and finish system.

1.08 QUALITY ASSURANCE

.1 Qualifications:

.1 Contractor: to have a minimum of 5 years proven satisfactory experience. When requested, provide list of last 3 comparable jobs including, job name and location, specifying authority, and project manager.

.2 Qualified journeypersons as defined by local jurisdiction to be engaged in painting work

.3 Apprentices: may be employed provided they work under direct supervision of qualified journeyperson in accordance with trade regulations.

.4 Conform to latest MPI requirements for exterior painting work including preparation and priming.

.5 Materials: in accordance with MPI Painting Specification Manual "Approved Product" listing and from a single manufacturer for each system used.

.6 Retain purchase orders, invoices and documents to prove conformance with noted MPI requirements when requested by HWDSB.

.7 Standard of Acceptance:

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Soffits: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

.8 Ensure that 50% of industrial coating or lining applications specialists persons, who perform concrete and steel surfaces preparation and coating applications, are certified by a recognized Applicator Certification Agency, in accordance with NACE 13 /SSPC ACS-I,

Applicator Certification Standard (ACS).

.9 Maintain a current and valid ACS certification during project period.

.1 Application specialists who perform surface preparation and coating application work on this project must have a current ACS.

.10 Notify HWDSB of any change in application specialist certification status.

.1 Any delays to the completion of the Project due to invalid certifications will not be considered, and liquidated damages shall not be waived for any non-performance by Contractor.

.2 Mock-Ups:

.1 When requested by HWDSB or Paint Inspection Agency, prepare and paint designated surface, area, room or item to requirements specified herein, with specified paint or coating showing selected colours, number of coats, gloss/sheen, textures and quality of work to MPI Painting Specification Manual standards for review and approval.

.2 Construct mock-ups in accordance with Section 01 43 00 - Quality Assurance.

.1 Submit 300mm x 300mm mock-up. Prepare and paint designated surface, area, room or item (in each colour scheme) to specified requirements, with specified paint or coating showing selected colours, gloss/sheen, textures.

.2 Mock-up will be used:

.1 To judge quality of work, substrate preparation, operation of equipment and material application and skill to MPI Architectural Painting Specification Manual standards.

.3 Locate where directed.

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

.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may not remain as part of finished work.

1.09 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with manufacturer's written instructions.

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

.1 Labels: to indicate:

.1 Type of paint or coating.

.2 Compliance with applicable standard.

.3 Colour number in accordance with established colour schedule.

.3 Storage and Handling Requirements:

.1 Store materials off ground or in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Observe manufacturer's recommendations for storage and handling.

.3 Store materials and supplies away from heat generating devices.

.4 Store materials and equipment in well ventilated area with temperature range 7 degrees C to 30 degrees C.

.5 Keep areas used for storage, cleaning and preparation, clean and orderly to approval of HWDSB. After completion of operations, return areas to clean condition to approval of HWDSB.

.6 Remove paint materials from storage only in quantities required for same day use.

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

.8 Fire Safety Requirements:

.1 Provide one 9 kg Type ABC fire extinguisher adjacent to storage area.

.2 Store oily rags, waste products, empty containers and materials subject to spontaneous combustion in ULC approved, sealed containers and remove from site on a daily basis.

.3 Handle, store, use and dispose of flammable and combustible materials in accordance with the National Fire Code of Canada (NFC).

.9 Replace defective or damaged materials with new.

1.10 SITE CONDITIONS

.1 Ambient Conditions:

.1 Heating, Ventilation and Lighting:

.1 Ventilate enclosed spaces.

.2 Do not perform painting work unless adequate and continuous ventilation and sufficient heating facilities are in place to maintain ambient air and substrate temperatures above 10 degrees C for 24 hours before, during and after paint application until paint has cured sufficiently.

.3 Where required, provide continuous ventilation for seven days after completion of application of paint.

.4 Coordinate use of existing ventilation system with HWDSB and ensure its operation during and after application of paint as required.

.5 Provide temporary ventilating and heating equipment where permanent facilities are not available or supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

.6 Perform no painting work unless a minimum lighting level of 323 Lux is provided on surfaces to be painted. Adequate lighting facilities to be provided by General Contractor.

.2 Temperature, Humidity and Substrate Moisture Content Levels:

.1 Unless specifically pre-approved by specifying body, Paint Inspection Agency and, applied product manufacturer, perform no painting work when:

.1 Ambient air and substrate temperatures are below 10 degrees C.

.2 Substrate temperature is over 32 degrees C unless paint is specifically formulated for application at high temperatures.

.3 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's prescribed limits.

.4 Relative humidity is above 85% or when dew point is less than 3 degrees C

variance between air/surface temperature.

.5 Rain or snow are forecast to occur before paint has thoroughly cured or when it is foggy, misty, raining or snowing at site.

.2 Perform no painting work when maximum moisture content of substrate exceeds:

.1 12 % for concrete and masonry (clay and concrete brick/block).

.2 15 % for hard wood.

.3 17 % for soft wood.

.4 12 % for plaster and gypsum board.

.3 Conduct moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple "cover patch test".

.4 Test concrete, masonry and plaster surfaces for alkalinity as required.

.3 Application Requirements:

.1 Apply paint finish in areas where dust is no longer being generated by related construction operations or when wind or ventilation conditions are such that airborne particles will not affect quality of finished surface.

.2 Apply paint to adequately prepared surfaces and to surfaces within moisture limits noted herein.

.3 Apply paint when previous coat of paint is dry or adequately cured.

.4 Apply paint finishes when conditions forecast for entire period of application fall within manufacturer's recommendations.

.5 Do not apply paint when:

.1 Temperature is expected to drop below 10 degrees C before paint has thoroughly cured.

.2 Substrate and ambient air temperatures are expected to fall outside MPI or paint manufacturer's limits.

.3 Surface to be painted is wet, damp or frosted.

.6 Provide and maintain cover when paint must be applied in damp or cold weather. Heat substrates and surrounding air to comply with temperature and humidity conditions specified by manufacturer. Protect until paint is dry or until weather conditions are suitable.

.7 Schedule painting operations such that surfaces exposed to direct, intense sunlight are scheduled for completion during early morning.

.8 Remove paint from areas which have been exposed to freezing, excess humidity, rain, snow or condensation. Prepare surface again and repaint.

.9 Paint occupied facilities in accordance with approved schedule only. Schedule operations to approval of HWDSB such that painted surfaces will have dried and cured sufficiently before occupants are affected.

2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

.1 Environmental Performance Requirements:

.1 Provide paint products meeting MPI"Environmentally Friendly" E1 ratings based on VOC (EPA Method 24) content levels

.2 Green Performance in accordance with MPI Standard GPS-1.

2.02 MATERIALS

.1 Only paint materials listed in latest edition of MPI Approved Products List (APL) are acceptable for use on this project

.2 Paint materials for paint systems: to be products of single manufacturer.

.3 Only qualified products with E2 "Environmentally Friendly" rating are acceptable for use on this project.

.4 Paints, coatings, adhesives, solvents, cleaners, lubricants, and other fluids, to be as follows:

.1 Be water-based.

.2 Be non-flammable.

.3 Be manufactured without compounds which contribute to ozone depletion in upper atmosphere.

.4 Be manufactured without compounds which contribute to smog in the lower atmosphere.

.5 Do not contain methylene chloride, chlorinated hydrocarbons, toxic metal pigments.

.6 Water-borne surface coatings must be manufactured and transported in a manner that steps of processes, including disposal of waste products arising there from, will meet requirements of applicable governmental acts, by-laws and regulations including, for facilities located in Canada, Fisheries Act and Canadian Environmental Protection Act (CEPA).

.7 Water-borne surface coatings must not be formulated or manufactured with aromatic solvents, formaldehyde, halogenated solvents, mercury, lead, cadmium, hexavelant chromium or their compounds.

.8 Water-borne surface coatings and recycled water-borne surface coatings must have flash point of 61.0 degrees C or greater.

.9 Both water-borne surface coatings and recycled water-borne surface coatings must be made by a process that does not release:

.1 Matter in undiluted production plant effluent generating a 'Biochemical Oxygen Demand' (BOD) in excess of 15mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.2 Total Suspended Solids (TSS) in undiluted production plant effluent in excess of 15mg/L to a natural watercourse or a sewage treatment facility lacking secondary treatment.

.10 Water-borne paints and stains, recycled water-borne surface coatings and water borne varnishes must meet a minimum "Environmentally Friendly" E2 rating.

.11 Recycled water-borne surface coatings must contain 50 % post-consumer material by volume.

.12 Recycled water-borne surface coatings must not contain:

.1 Lead in excess of 600.0 ppm weight/weight total solids.

.2 Mercury in excess of 50.0 ppm weight/weight total product.

.3 Cadmium in excess of 1.0 ppm weight/weight total product.

.4 Hexavelant chromium in excess of 3.0 ppm weight/weight total product.

.5 Organochlorines or polychlorinated biphenyls (PCBS) in excess of 1.0 ppm weight/weight total product.

.13 The following must be performed on each batch of consolidated post-consumer material before surface coating is reformulated and canned. These tests must be performed at a laboratory or facility which has been accredited by the Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846

2.03 COLOURS

.1 HWDSB will provide Colour Schedule after Contract award. Submit proposed Colour Schedule to HWDSB for approval.

.2 Colour schedule will be based upon selection of 5 base colours and 3 accent colours. No more than 8 colours will be selected for entire project and no more than 3 colours will be selected in each area.

.3 Selection of colours will be from manufacturers' full range of colours.

.4 Where specific products are available in restricted range of colours, selection will be based on limited range.

.5 Second coat in three coat system to be tinted slightly lighter colour than top coat to show visible difference between coats if requested by HWDSB.

.6 For deep and ultra deep colours 4 coats may be required.

2.04 MIXING AND TINTING

.1 Perform colour tinting operations prior to delivery of paint to site. On-site tinting of painting materials is allowed only with HWDSB written permission.

.2 Mix paste, powder or catalyzed paint mixes in accordance with manufacturer's written instructions.

.3 Add thinner to paint manufacturer's recommendations. Do not use kerosene or organic solvents to thin water-based paints.

.4 Thin paint for spraying according in accordance with paint manufacturer's instructions. If directions are not on container, obtain instructions in writing from manufacturer and provide copy of instructions to HWDSB.

.5 Re-mix paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and colour and gloss uniformity.

.6 Deep and ultra deep colors; 4 coats may be required.

2.05 GLOSS/SHEEN RATINGS

.1 Paint gloss: defined as sheen rating of applied paint, in accordance with following values:

Gloss Level Category	Units @ 60 Degrees	Units @ 85 Degrees
G1 - matte finish	0 to 5	max. 10

Gloss Level Category	Units @ 60 Degrees	Units @ 85 Degrees
G2 - velvet finish	0 to 10	10 to 35
G3 - eggshell finish	10 to 25	10 to 35
G4 - satin finish	20 to 35	min. 35
G5 - semi-gloss finish	35 to 70	
G6 - gloss finish	70 to 85	
G7 - high gloss finish	> 85	

.2 Gloss level ratings of painted surfaces as specified and as noted on Finish Schedule.

2.05 SOURCE QUALITY CONTROL

.1 Perform following tests on each batch of consolidated post-consumer material before surface coating is reformulated and canned. Testing by laboratory or facility which has been accredited by Standards Council of Canada.

.1 Lead, cadmium and chromium are to be determined using ICP-AES (Inductively Coupled Plasma - Atomic Emission Spectroscopy) technique no. 6010 as defined in EPA SW-846

.2 Mercury is to be determined by Cold Vapour Atomic Absorption Spectroscopy using Technique no. 7471 as defined in EPA SW-846

.3 Organochlorines and PCBs are to be determined by Gas Chromatography using Technique no. 8081 as defined in EPA SW-846

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.02 GENERAL

.1 Perform preparation and operations for interior painting in accordance with MPI Architectural Painting Specifications Manual except where specified otherwise

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

3.03 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable to be painted in accordance with manufacturer's written instructions:

.1 Visually inspect substrate in presence of HWDSB.

.2 Inform HWDSB of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from HWDSB.

.2 Exterior repainting work: inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor to notify Paint Inspection Agency minimum of [one] week prior to commencement of work and

provide copy of project repainting specification and Finish Schedule.

.3 Exterior surfaces requiring repainting: inspected by both painting contractor and Paint Inspection Agency who will notify HWDSB in writing of defects or problems, prior to commencing repainting work, or after surface preparation if unseen substrate damage is discovered.

.4 Where assessed degree of surface degradation of DSD-1 to DSD-3 before preparation of surfaces for repainting is revealed to be DSD-4 after preparation, repair or replacement of such unforeseen defects discovered are to be corrected, as mutually agreed, before repainting is started.

.5 Where "special" repainting or recoating system applications (i.e. elastomeric coatings) or non- MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to HWDSB.

3.04 PREPARATION

.1 Perform preparation and operations for exterior painting in accordance with MPI Maintenance Repainting Manual except where specified otherwise

.2 Apply paint materials in accordance with paint manufacturer's written application instructions.

.3 Clean and prepare exterior surfaces to be repainted in accordance with MPI Maintenance Repainting Manual requirements. Refer to the MPI Manual in regard to specific requirements and as follows:

.1 Remove dust, dirt, and surface debris by vacuuming, wiping with dry, clean cloths or compressed air.

.2 Wash surfaces with a biodegradable detergent and bleach where applicable and clean warm water using a stiff bristle brush to remove dirt, oil and other surface contaminants.

.3 Rinse scrubbed surfaces with clean water until foreign matter is flushed from surface.

.4 Allow surfaces to drain completely and allow to dry thoroughly. Allow sufficient drying time and test surfaces using electronic moisture meter before commencing work.

.5 Use water-based cleaners in place of organic solvents where surfaces will be repainted using water based paints.

.6 Many water-based paints cannot be removed with water once dried. Minimize use of kerosene or such organic solvents to clean up water-based paints.

.4 Clean metal surfaces to be repainted by removing rust, dirt, oil, grease and foreign substances in accordance with MPI requirements. Remove such contaminates from surfaces, pockets and corners to be repainted by brushing with clean brushes, blowing with clean dry compressed air, or brushing/vacuum cleaning as required.

.5 Prevent contamination of cleaned surfaces by salts, acids, alkalis, other corrosive chemicals, grease, oil and solvents before priming and between applications of remaining coats. Touch-up, spot prime, and apply primer, paint, or pretreatment as soon as possible after cleaning and before deterioration occurs.

.6 Do not apply paint until prepared surfaces have been accepted by HWDSB.

.7 Sand and dust between coats as required to provide adequate adhesion for next coat and to remove defects visible from a distance up to 1000 mm.

3.05 EXISTING CONDITIONS

.1 Conduct moisture testing of surfaces to be painted using a properly calibrated electronic moisture meter, except test concrete floors for moisture using a simple "cover patch test" and report findings to HWDSB. Do not proceed with work until conditions fall within acceptable range as recommended by manufacturer.

.2 Maximum moisture content as follows:

.1 Stucco: 12 %.

.2 Concrete: 12 %.

.3 Clay and Concrete Block/Brick: 12 %.

.4 Hard Wood: 15 %.

.5 Soft Wood: 17 %

3.06 PROTECTION

.1 Protect existing building surfaces and adjacent structures from paint spatters, markings and other damage by suitable non-staining covers or masking. If damaged, clean and restore such surfaces as directed by HWDSB.

.2 Protect items that are permanently attached such as Fire Labels on doors and frames.

.3 Protect factory finished products and equipment.

.4 Protect [passing pedestrians], [building occupants] [and general public] in and about building.

.5 Remove light fixtures, surface hardware on doors, and other surface mounted equipment, fittings and fastenings prior to undertaking painting operations.Store items and re-install after painting is completed.

.6 Move and cover exterior furniture and portable equipment as necessary to carry out painting operations. Replace as painting operations progress.

.7 As painting operations progress, place "WET PAINT" signs in pedestrian and vehicle traffic areas to approval of HWDSB.

3.07 APPLICATION

.1 Method of application to be as approved by HWDSB. Apply paint by brush, and roller. Conform to manufacturer's application instructions unless specified otherwise.

.2 Brush and Roller Application:

.1 Apply paint in a uniform layer using brush and/or roller of types suitable for application.

.2 Work paint into cracks, crevices and corners.

.3 Paint surfaces and corners not accessible to brush using spray, daubers and/or sheepskins. Paint surfaces and corners not accessible to roller using brush, daubers or sheepskins.

.4 Brush and/or roll out runs and sags, and over-lap marks. Rolled surfaces to be free of roller tracking and heavy stipple unless approved by HWDSB.

.5 Remove runs, sags and brush marks from finished work and repaint.

.3 Spray Application:

.1 Provide and maintain equipment that is suitable for intended purpose, capable of properly atomizing paint to be applied, and equipped with suitable pressure regulators and gauges.

.2 Keep paint ingredients properly mixed in containers during paint application either by

continuous mechanical agitation or by intermittent agitation as frequently as necessary.

.3 Apply paint in a uniform layer, with overlapping at edges of spray pattern.

.4 Brush out immediately runs and sags.

.5 Use brushes to work paint into cracks, crevices and places which are not adequately painted by spray.

.6 Wood, stucco, concrete, cement masonry units CMU's and brick; if sprayed, must be back rolled.

.4 Use dipping, sheepskins or daubers when no other method is practical in places of difficult access and when specifically authorized by HWDSB.

.5 Apply coats of paint as continuous film of uniform thickness. Repaint thin spots or bare areas before next coat of paint is applied.

.6 Allow surfaces to dry and properly cure after cleaning and between subsequent coats for minimum time period as recommended by manufacturer.

.7 Sand and dust between coats to remove visible defects.

.8 Finish surfaces both above and below sight lines as specified for surrounding surfaces, including such surfaces as projecting ledges.

.9 Finish top, bottom, edges and cutouts of doors after fitting as specified for door surfaces.

3.08 MECHANICAL/ELECTRICAL EQUIPMENT

.1 Unless otherwise specified, paint exterior exposed conduits, piping, hangers, duct work and other mechanical and electrical equipment with colour and finish to match adjacent surfaces, except as noted otherwise.

.2 Do not paint over nameplates.

.3 Paint fire protection piping red.

.4 Paint natural gas piping yellow.

.5 Paint steel electrical light standards. Do not paint outdoor transformers and substation equipment.

3.09 SITE QUALITY CONTROL

.1 Exterior painting and decorating work to be inspected by MPI Accredited Paint Inspection Agency (inspector) acceptable to specifying authority and local Painting Contractor's Association. Painting contractor will notify Paint Inspection Agency a minimum of one week prior to commencement of work and provide a copy of project painting specification, plans and elevation drawings (including pertinent details) as well as Finish Schedule.

.2 Exterior surfaces requiring painting to be inspected by Paint Inspection Agency who will notify HWDSB and General Contractor in writing of defects or problems, prior to commencing painting work, or after prime coat shows defects in substrate.

.3 Where "special" painting, coating or decorating system applications (i.e. elastomeric coatings) or non- MPI listed products or systems are to be used, paint or coating manufacturer to provide as part of this work, certification of surfaces and conditions for specific paint or coating system application as well as on site supervision, inspection and approval of their paint or coating system application as required at no additional cost to HWDSB.

.4 Standard of Acceptance:

.1 Walls: no defects visible from a distance of 1000 mm at 90 degrees to surface.

.2 Ceilings: no defects visible from floor at 45 degrees to surface when viewed using final lighting source.

.3 Final coat to exhibit uniformity of colour and uniformity of sheen across full surface area.

.5 Field inspection of painting operations to be carried out by independent inspection firm as designated by HWDSB.

.6 Advise HWDSB when surfaces and applied coating is ready for inspection. Do not proceed with subsequent coats until previous coat has been approved.

.7 Cooperate with inspection firm and provide access to areas of work.

.8 Retain purchase orders, invoices and other documents to prove conformance with noted MPI requirements when requested by HWDSB.

3.10 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 00 - Cleaning:

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Waste Management and Disposal.

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

3.11 RESTORATION

.1 Clean and re-install hardware items removed before undertaken painting operations.

.2 Remove protective coverings and warning signs as soon as practical after operations cease.

.3 Remove paint splashings on exposed surfaces that were not painted. Remove smears and spatter immediately as operations progress, using compatible solvent.

.4 Protect freshly completed surfaces from paint droppings and dust to approval of HWDSB. Avoid scuffing newly applied paint.

.5 Restore areas used for storage, cleaning, mixing and handling of paint to clean condition as approved by HWDSB.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

1.02 DEFINITIONS

1.03 REFERENCE STANDARDS

.1 National Electrical Manufacturers Association (NEMA): www.nema.org:

.1 NEMA ICS 6 Industrial Control and Systems Enclosures

.2 National Fire Protection Association (NFPA): www.nfpa.org:

.1 NFPA 70 National Electrical Code

.2 NFPA 701 Standard Methods of Fire Tests for Flame Propagation of Textiles and Films

.3 Window Covering Manufacturers Association: www.access-board.gov:

1. WCMA A 100.1 Safety of Corded Window Covering Products (ANSI)

.4 Lead Free: RoHS/Directive 2002/95/ED, US Consumer Product Safety Commission Section 101 and REACH (EC 1907/2006)

.5 GREENGUARD Environmental Institute Gold

1.04 ADMINISTRATIVE REQUIREMENTS

.1 Pre-installation Conference: Conduct conference at Project site. Include representatives of Contractor, Owner, Architect, roller shade Installer, Installers of electrical connections, and others affecting or affected by the Work. Review the following:

1. Requirements of Contract Documents.

2. Requirements of shop drawings.

3. Delivery, storage, and handling.

4. Power and control wiring requirements for motor-operated roller shades.

.2 Coordination:

1. Coordinate installation of roller shades with installation of wall construction and connections to building services.

2. Coordinate installation of anchors and blocking indicated on roller shade shop drawings.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

.1 Product Data: For each type of (roller shades) product indicated. Include styles, material

descriptions, construction details, dimensions of individual components and profiles, features, finishes, and operating instructions.

.2 Shop Drawings: For roller shades.

.1 Provide plans, elevations, sections, product details, installation details, operational clearances, and relationship to adjacent work.

.2 Locations and requirements for recesses and attachments to other work, including general construction, anchorage methods and locations, and service connections and locations.

.3 Include diagrams for power, signal, and control wiring including dimensioned connection locations.

.4 Indicate locations for fabric selections when more than one type is required.

.3 Samples for Initial Selection: For each type and color of shade material.

.1 Include Samples of exposed accessories involving color selection.

.4 Samples for Verification: For each type of roller shade.

.1 Shade Material: Not less than 8"x10" sample.

.2 Roller Shade: Full-size operating unit, not less than 16 inches (400 mm) wide by 36 inches (900 mm) long for each type of roller shade indicated.

.3 Installation Accessories: Full-size unit, not less than 10 inches (250 mm) long.

.5 Window Treatment Schedule: For roller shades. Use same designations indicated on Drawings.

1.06 INFORMATIONAL SUBMITTALS

.1 Qualification Data: For qualified roller shade fabricator and Installer.

.2 Product Certificates: For each type of shade material.

.3 Product Test Reports: For each type of shade material, certifying compliance with requirements.

.4 Low-Emitting Product Certificate: For roller window shade fabric products specified to meet volatile organic emissions standards, submit GREENGUARD certification or comparable certification acceptable to Architect.

.5 Lead-Free Certification: For roller window shade fabric products specified to meet lead free standards, submit RoHS certification or comparable certification acceptable to Architect.

1.07 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: For roller shades, to include in maintenance manuals.

.1 Methods for maintaining roller shades and finishes.

.2 Precautions about cleaning materials and methods that could be detrimental to fabrics, finishes, and performance.

1.08 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Obtain roller shades through one source from a single manufacturer with a minimum of 30 years' experience in manufacturing products comparable to those specified in this section.

.2 Installer Qualifications: Experienced Installer, trained and certified by manufacturer, who has completed at least five installations similar in material, design, and extent to that indicated for this Project with a record of successful in-service performance.

.3 Fire-Test response characteristics: Passes NFPA 701-99 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

.4 Anti-Microbial Characteristics: "No Growth" per ASTM G 21, G 22, G 2180, results for fungi ATCC 9642, ATCC 9644, ATCC 9645, RITB 2101.

.5 Mockups: If architect requires, provide a mock-up of one roller shade assembly specified for evaluation of mounting, appearance and accessories.

1. Locate mock-up in window designated by Architect.

2. Do not proceed with remaining work until mock-up is accepted by architect.

1.09 DELIVERY, STORAGE AND HANDLING

.1 Do not deliver window shades until building is enclosed and construction within spaces which require shades is substantially complete.

.2 Deliver products in manufacturer's unopened, original, undamaged containers with all labels intact.

.3 All containers and shades to be labeled according to Window Shade Schedule

.4 All products to be stored in manufacturer's unopened packaging until site is ready for installation.

1.10 SITE CONDITIONS

.1 Environmental Limitations: Install roller shades after finish work, including painting, is complete and ambient temperature and humidity conditions are maintained at levels indicated for Project when occupied for its intended use.

1.11 WARRANTY

.1 Roller Shade Non-Electric Hardware: Manufacturer's standard non-depreciating twenty-five

(25) year limited warranty. Chain to have manufacturer's standard, non-depreciating one (1) year limited warranty.

.2 Roller Shade Electrical Components: Electrical components, including plug-in and battery-powered motors, have Manufacturer's non-depreciating five (5) year warranty.

.3 Roller Shade Installation: One (1) year from date of Substantial Completion, not including scaffolding, lifts or other means to reach inaccessible areas.

.4 Roller Shade Fabric: Manufacturer's non-depreciating [ten] year limited warranty on fabrics installed on the interior. See Fabric Specification for specific fabric warranty.

2 PRODUCTS

2.1 SHADE GENERAL NOTES

.1 Manual operating interior, chain driven, roller shades in all windows of rooms and spaces indicated on the Drawings.

.1 Manual operating interior, window header mounted design with extended bracket; manually operated; chain and sprocket roller shade system with infinite positioning; each shade unit consisting of two end brackets, shade tube, fascia, hembar and fabric; e.g. Teleshade System by Solarfective with Standard Finish fascia and 2703 series sun control fabric.

2.2 ROLLER SHADE COMPONENTS

.1 Rollers: Extruded aluminum or corrosion-resistant aluminum tubes sized to accommodate roller operating mechanisms and specified Shades without deflection. Equip with permanently-lubricated drive-end and idle-end assemblies configured to allow removal of Shades for servicing.

.1 Direction of Shade Roll: Regular, from exterior face of roller

.2 Shade-to-Roller Attachment: Manufacturer's standard method.

.2 Chain-and-Clutch Operating Mechanism: Continuous-loop bead chain and clutch that stops shade movement when bead chain is released; with upper and lower limit stops; permanently adjusted and lubricated.

.1 Bead Chains: #10 qualified stainless-steel chain rated to 90 lbs. (41 kg) minimum breaking strength. Nickel plated chain shall not be accepted.

.1 Loop Length: No longer than 22cm, as per Canadian law

.2 Chain-Tensioner Type: Chain tensioner, jamb mounted

.3 Mounting Hardware: Manufacturer's standard brackets or endcaps, corrosion resistant and compatible with roller assembly, operating mechanism, installation accessories, and mounting

location and conditions.

.1 Bracket to be a minimum one sixteenth (1/16) in. (1.59mm) stamped steel, or heavier as required.

.4 Shade Bottom:

.1 Hem Bar: Extruded aluminum. Hem bar to be sealed on both ends using impulse welder.

.5 Installation Accessories:

.1 Front Fascia: Aluminum extrusion that conceals front and underside of roller and operating mechanism and attaches to roller endcaps without exposed fasteners.

.1 Shape: L-Shaped

.2 Height: Fabricator's standard height required to conceal roller and Shade assembly when shade is rolled up, but not less than 3 inches (76 mm)

.3 Color: As selected by Architect from manufacturer’s full range.

.2 Shade Head box: Rectangular, extruded-aluminum enclosure including front fascia, top and back covers, endcaps, and removable bottom closure.

.1 Height: Fabricator's standard height required to enclose roller and Shade assembly when shade is rolled up, but not less than 3 inches (76 mm).

.2 Shade Headbox to be exposed.

.3 Color: As selected by Architect from manufacturer’s full range.

.3 Endcap Covers: To cover exposed endcaps.

.1 Color: to match shade head box.

.4 Installation Accessories Color and Finish: As selected from manufacturer's full range.

.5 Supply 20 additional retaining clips for window shade pull cord.

2.3 ROLLER WINDOW SHADE FABRIC

.1 Light Filtering Fabrics

.1 Sun control fabric: woven of 0.18 opaque, vinyl coated polyester yarn consisting of approximately 79% vinyl and 21% 500 dernier polyester core yarn; tensioned prior to heat setting; to NFPA 701 and CAN-ULC-S109; Grey colour, 1 percent open. Acceptable manufacturers: Solarfective, Concord Shading Systems Inc., Sun Project of Canada Inc.

2.4 ROLLER WINDOW SHADE UNIT FABRICATION

.1 Roller Window Shade Unit Sizes: Fabricate units in sizes required to fill openings in

configuration indicated:

.1 Inside of Jamb Installation: Width and length equal to opening size less clearances recommended by manufacturer.

.2 Outside of Jamb Installation: Width and length as indicated, with terminations between shades of end-to-end installations at centerlines of defined vertical separations between openings.

.2 Shade Fabrication: Fabricate Shades without battens or seams to extent possible, except for the following conditions:

.1 Railroaded Materials: Railroad material where material roll width is less than the required width of Shade and where indicated.

3 EXECUTION

3.1 EXAMINATION

.1 Examine roller window shade unit substrates with Installer for compliance with approved submittals and other conditions affecting performance of the Work.

.2 Verify locations of connections to building electrical system.

.3 Proceed with installation once unsatisfactory conditions have been corrected.

3.2 PREPARATION

.1 Contractor shall clean Surfaces thoroughly prior to installation.

.2 Coordinate requirements for blocking and structural supports to ensure adequate means for installation of window shades.

.3 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

.1 Install roller window shade units level, plumb, square, and aligned with adjacent units according to fabricator's written instructions.

.2 Roller Window Shade Unit Locations: As indicated in window-covering schedule.

.3 Adjust and balance roller shades to operate smoothly, easily, safely, and free from binding, tracking or malfunction throughout entire operational range.

3.4 CLEANING AND PROTECTION

.1 Clean roller window shade unit surfaces, after installation, according to manufacturer's written instructions.

.2 Provide final protection and maintain conditions that ensure that roller window shade units are without damage at time of Substantial Completion.

.3 Protect installed products until completion of project.

.4 Replace damaged roller window shade units that cannot be repaired, before time of Substantial Completion.

3.5 TRAINING

.1 Engage a manufacturer-authorized service representative to train Owner's maintenance personnel to adjust, operate and maintain manual roller shaded systems.

.2 Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain motor-operated roller window shade units.

END OF SECTION