MONSIGNOR JOHN PEREYMA CSS WINDOW REPLACEMENT 2021

Tender No. T20-36



ARCHITECTURAL SPECIFICATIONS

Moffet & Duncan Architects Inc. Prime Consultant

MONSIGNOR JOHN PEREYMA C.S.S. WINDOW REPLACEMENT 2021 DURHAM CATHOLIC DISTRICT SCHOOL BOARD

Architectural

Moffet & Duncan Architects Inc.



The seal above pertains to the specification sections bearing the name of the Consultant at the bottom of each page.

MONSIGNOR JOHN PEREYMA C.S.S. WINDOW REPLACEMENT 2021 DURHAM CATHOLIC DISTRICT SCHOOL BOARD

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1.1 GENERAL

.1 The drawings listed below are included on large format sheets and bound together.

1.2 ARCHITECTURAL DRAWINGS

- .1 A1 Ground Floor Plan
- .2 A2 Second Floor Plan
- .3 A3 Elevations and Window Types
- .4 A4 Window Details and Electrical Notes
- .5 A5 Details
- .6 A6 Details

END OF SECTION

1.1 CONTRACT DOCUMENTS

- .1 Contract documents for work under this contract consists of the following:
 - .1 Standard Construction Document CCDC 2, 2008
 - .2 Supplementary Conditions to CCDC2, included in the Request for Tender documents
 - .3 Specifications as listed in Index to Specifications
 - .4 Drawings as listed in List of Drawing Sheets, Section 00 01 15
 - .5 All Addenda issued prior to closing of the tender
 - .6 Amendments incorporated prior to the signing of the Contract, as agreed to between the signing parties.

1.2 **RELATION OF TRADES**

- .1 These specifications have been divided generally into sections conforming to Construction Specifications Canada Master Format 2016 for the purpose of ready reference. They must be read as a whole. The responsibility for apportioning the work or of settling disputes related to same shall rest entirely with the Contractor.
- .2 The Contractor is responsible for co-ordinating all trades, and is solely responsible for determining the lines of demarcation between Contractor and/or trades. Neither the Consultant nor the Owner assume any responsibility for any such determination or for any dispute arising concerning it. No extras will be considered due to any such dispute concerning either labour or materials.
- .3 Specifications and drawings form an integral part of the Contract Documents. Any subject or item omitted from one but which is mentioned or reasonably implied in the other, shall be considered properly and sufficiently specified and will be part to the work.

1.3 **PHASING OF THE WORK**

- .1 The School will be occupied during the school academic year. Work must be phased to give priority to those spaces which cannot be vacated to accommodate the Work when school is in session.
- .2 Work in the following critical areas must be undertaken during the summer school break, with all work in these areas completed by Friday, August 27, 2021.
 - .1 Administration areas
 - .2 Stairwells
 - .3 Cafeteria
- .3 Non-critical rooms, including classrooms, can be made available, in groups of 2 or 3 at a time, to allow work from June 12, 2021 and during the months of September to December, 2021.
- .4 All work during the school year must be scheduled with the school principal.
- .5 All work must be complete by the end of December 2021.

1.4 ACCESS TO THE PROJECT

.1 The Contractor for this work shall at all times allow the Owner or any other contractor or their employees in the building or around the premises, undisturbed, whether union or non-union, as may be required in the execution of other portions of the building work and installation of equipment, etc.

1.5 **EXAMINATION OF SITE**

- .1 Examine existing building and site immediately prior to commencing Work to confirm that building and site as received by the Contractor conform to information on tender documents.
- .2 Notify Consultant immediately if site conditions are not acceptable. Commencement of the Work of this Contract will be taken as acceptance of site conditions. No extras will be considered unless accepted in advance of performance of the work, in writing, by Owner and Consultant.

1.6 ACCEPTANCE OF WORK IN PLACE

- .1 Before starting their work and from time to time as the work progresses, each subcontractor shall examine the work and materials installed by the other subcontractors insofar as it affects their own work, and shall promptly notify the Consultant IN WRITING, if any condition exists that will prevent them from giving a satisfactory result in their own work.
- .2 Should the subcontractor start their own work without such notification, it shall be construed as an acceptance by them of all preceding work and as a waiver of all claims or questions as to its suitability for receiving their work.

1.7 MATERIALS AND WORKMANSHIP

- .1 All materials shall be new and the best of their respective kinds. Where a specific grade or brand is not indicated preference shall be given to materials of Canadian manufacture. Pre-packaged materials shall be delivered and stored in unopened containers.
- .2 All work performed under this Contract shall be done by mechanics skilled in their respective trades. They shall make use of such templates, jigs or special tools as may be required for the operation involved.
- .3 The Contractor is responsible for maintaining quality of workmanship. They shall report to the Consultant whenever the Work or material of any trade does not meet the required standard.
- .4 The acceptance of any materials or workmanship shall not be a bar to their subsequent rejection, if found defective.
- .5 Rejected materials and workmanship, and any work which is found defective, shall be removed and replaced or made good by the Contractor without cost to the Owner and to the satisfaction of the Consultant.
- .6 Adequate, dry storage facilities shall be provided and all stored materials shall be protected from damage and theft.

- .7 Perform Work in accordance with the best industry practice of the type of work specified, unless the Contract Documents stipulate more precise requirements, in which case, the more precise requirements shall govern.
- .8 Do Work in a neat, plumb and square manner. Ensure that various work components are properly installed, forming tight joints and appropriately aligned junctions, edges and surfaces, free of warps, twists, waves, or other such irregularities.
- .9 Wherever indicated on the drawings or specifications, or in the manufacturers'/suppliers' written instructions, arrange to have manufacturers'/installer's representatives inspect the Work which incorporates their materials, products or items.
- .10 Do not permit materials to come in contact with other materials such conditions may result in corrosion, staining, discolouration or deterioration of the completed Work. Provide compatible, durable separators where such contact is unavoidable.
- .11 The design of the Work is based on the full interaction of its component parts. No provisions have been made for conditions occurring during construction. Ensure that no part of the Work is subjected to a load which will endanger its safety or which might cause permanent deformation.
- .12 Provide and maintain control lines and levels required for the Work. Lay out the Work in accordance with these lines and levels and dimensions indicated on the drawings.
- .13 Verify lines, levels and dimensions and report any errors or inconsistencies on the drawings to the Consultants.
- .14 Final responsibility of satisfactory completion of all the Work, however, lies with the Contractor.

1.8 SECURITY

- .1 The Contractor shall be responsible for security of all areas affected by the Work of this Contract until taken over by the Owner. Steps shall be taken to prevent entry to the Work by unauthorized persons and to guard against theft, fire and damage by any cause.
- .2 A regular full-time watchman will be required on site at any time that the building is not fully secured and construction personnel are not on site, ie nights, weekends, holidays, stoppages, etc. In addition if, in the opinion of the Consultant, the Work is not adequately protected by the Contractor at any time, the Owner may demand that a watchman be employed by the Contractor at no extra cost to the Contract. The cost of site security at any time during the Contract shall be fully borne by the Contractor.

1.9 SCAFFOLDING

- .1 All necessary scaffolding shall be provided and constructed according to by-law and safety regulations.
- .2 Construct and maintain scaffolding in rigid, secure and safe manner.

SECTION 01 10 00 - GENERAL INSTRUCTIONS

- .3 Erect scaffolding independent of building walls.
- .4 Avoid interference with other trades.
- .5 Move when not in use to permit installation of other work and promptly remove when no longer required.
- .6 The provision of scaffolding shall be a matter of agreement between the Contractor and Subcontractors.

1.10 **PROTECTION OF OTHER WORK**

- .1 Each trade shall avoid damage to other trades and shall take all measures necessary and provide all masking and materials necessary to provide adequate protection.
- .2 Each Contractor and Subcontractor shall be held responsible for all damage to work installed by others that is caused by this work or by anyone employed by them.
- .3 Patching and repairing of damaged work shall be done by the contractor who installed the work, as directed by the Consultant, but the cost of same shall be paid for by the contractor who is responsible for the damage.

1.11 **FASTENINGS**

- .1 All fastenings must be permanent, of same metal or compatible with any metals with which they are in contact, of adequate size and spacing to ensure permanent anchorage against load or shear.
- .2 Exposed fastenings must be evenly spaced, neatly laid out and must not mar surfaces of prefinished materials.
- .3 No ram setting or similar techniques will be permitted without prior written approval of the Consultant.
- .4 No wood plugs and no anchorages which cause spalling or cracking will be accepted.
- .5 All fasteners exposed on the exterior must be stainless steel.

1.12 SUPPLY AND INSTALL

.1 Unless specifically noted "supply only", any reference to supply intends the supply and installation of material or item so noted.

1.13 OCCUPATION BEFORE COMPLETION

.1 If the Contractor, for any reason, does not have the job completed by the completion date and the Owner, of necessity, is forced to occupy any part of the building before the whole of the work in the area is completed, the Contractor will not be entitled to any indemnity for interference with their operations.

1.14 **GENERAL REQUIREMENTS**

- .1 All Subcontractors shall examine carefully all drawings and specifications to inform themselves fully of all conditions and limitations pertaining to the work of the contract.
- .2 All Subcontractors shall co-operate and co-ordinate their work for the proper completion of the work, including co-ordination of delivery dates and commencement of sub-trades work.
- .3 The responsibility for all work, including temporary structures, shoring and erection shall at all times rest with the Contractor and their Subcontractors. The Consultant will review construction methods and shop drawings for general arrangements only. The method of obtaining the results contemplated by the Contract Documents shall be determined by the Contractor.
- .4 The undertaking of periodic site review by the Consultant or Owner's representative shall not be construed as supervision of actual construction, nor make them responsible for providing a safe place for work, visit, use, access, travel, or occupancy of their employees or agents.
- .5 The Contractor shall be fully responsible for co-ordinating and expediting the work of all Subcontractors and shall employ the necessary and qualified personnel to provide the required quality of labour and materials and to prevent delays in the progress of the project. Each trade shall be afforded all reasonable opportunities for the installation of its work and for the storage and handling of its materials.

1.15 **ELECTRICAL WORK**

- .1 The Contractor shall engage a licenced electrician to do all electrical work required for powered window operating hardware, motorized blinds, including wall switches, all removals, relocations, and reinstallations of electrical and lighting fixtures, and provision of all new wiring, conduit, and raceways, and accessories as identified on drawings and as specified.
- .2 Electrical work shall conform to the Canadian Electrical Code, Electrical Safety Authority, and requirements of local Authorities Having Jurisdiction.
- .3 Obtain all permits required for electrical work. Permit fees are to be paid by the Contractor for reimbursement through the Cash Allowance included in the Contract.

1.16 COORDINATION

- .1 Coordinate all work and preparation on which subsequent work depends to facilitate mutual progress, and to prevent any conflict.
- .2 Review all drawings to identify interference issues prior to commencing construction. Review all shop drawings, samples, product data, mock-ups, and other required submittals for potential interference issues and co-ordinate with the trades to avoid these conflicts.
- .3 Where interference issues arise during construction, correct work at no expense to the Owner where the interference could have reasonably been foreseen.

SECTION 01 10 00 - GENERAL INSTRUCTIONS

- .4 Ensure that each trade makes known, for the information of the Contractor and other trades, the environmental and surface conditions required for the execution of its work; and that each trade makes known the sequence of others' work required for installation of its work.
- .5 Ensure that each trade, before commencing work, knows requirements for subsequent work and that each trade is assisted in the execution of its preparatory work by trades whose work depends upon it.
- .6 Review all shop and layout drawings, templates, and other required submittals for coordination purposes.
 - .1 Ensure that all information necessary for the location and installation of materials, openings, inserts, anchors, accessories, fastenings, connections, etc., are provided by each trade whose work requires co-operative location and installation by other trades and that such information is communicated to the applicable installer.
 - .2 Ensure that shop drawings for aluminum and hollow metal work are coordinated with the openings for doors, frames and windows; site measurements must be indicated on the drawings.
- .7 Deliver materials supplied by one trade to be installed by another well before the installation begins.
- .8 Trades giving installation information in error, or too late to incorporate in the work, shall be responsible for any extra work caused thereby.
- .9 Immediately remove any work which is unsatisfactory for subsequent work, as directed by the Consultant or by the appointed inspection firms.

1.17 SPECIAL REQUIREMENTS FOR OCCUPIED BUILDINGS

- .1 All work on site, outside of construction enclosures, must be scheduled with the school principal when the school is occupied.
- .2 Maintain all emergency exits at all times. Do not interfere with building access, particularly in the 30 minutes before school commences each day and 30 minutes before and after the school day ends. Confirm timing of school day start and end, and lunch times, with school principal.
- .3 All work which will result in excessive noise, dust, odours, or other unpleasant or unhealthy situations, shall take place outside of school hours, on evenings, weekends, or school holidays. Asphalting on roof and asphalt paving, in particular, must be scheduled when building is unoccupied.
- .4 Ensure continuity of all utilities, including power and water. Schedule any required interruptions outside of school hours, in coordination with the school principal.
- .5 Suppress dust, avoid conditions likely to disperse mould or fungus of any kind, and take steps reasonably necessary to maintain the safety and comfort of the building occupants.
- .6 Cease any activity if advised by the school principal, or vice-principal that it is disruptive or offensive to building occupants.

- .7 Workers are not permitted to use washrooms, building entrances, or parking areas other than those designated by the School Principal.
- .8 Refer to Section 01 35 20 for additional site safety requirements which apply when the building is occupied.

1.18 **SUB-TRADE AWARDS**

.1 The Contractor shall, on notice of award of the contract, obtain the Consultant's approval of a complete list of all persons or firms to which they propose to sublet any part of the work, the trades or divisions of work which are to be sublet to each, and the amount of each trade. They shall provide to the Consultant a financial breakdown showing all divisions of the work amounting to the full sum of the contract.

1.19 SAFETY DATA SHEETS

- .1 The Contractor shall submit material and safety data sheets prior to commencing installation and application of at least the following:
 - .1 lead-free solder
 - .2 sealants and caulking
 - .3 foamed in place insulating sealants
 - .4 painting and finishing
 - .5 all adhesives
 - .6 any other product which may give off air borne particles after installation
- .2 The Contractor and all of their Subcontractors must note that specifically, asbestos and asbestos containing materials, solder for piping containing lead, and painting and coatings containing lead and/or mercury must be excluded from any part of the Work.
- .3 The Contractor must submit Certificates of Compliance, prior to the application for Substantial performance, for each of the following items:
 - .1 Products for which Material Safety Data Sheets have been submitted and accepted.
 - .2 Other Work/Products identified in the Contract Documents as requiring a Certificate of Compliance.
- .4 Each Certificate of Compliance must indicate names and addresses of the project, the Owner, the date of Issue, produce description including name, number, manufacturer, with a statement verifying that the Work/Product installed meets specified requirements and, if applicable, complies with the submitted and accepted Material Safety Data Sheets.
- .5 Each Certificate of Compliance must be issued on the trade's letterhead, properly executed, under whose work the respective Work/Product has been provided.
- .6 Each Certificate of Compliance must be endorsed by the Contractor with their authorized stamp/signature.

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- .7 The Contractor must ensure that submissions are made to allow sufficient time for review without delaying progress of scheduled completion.
- .8 WHMIS Material Safety Data Sheets (MSDS) are required to be provided before or with the first delivery of every controlled product.
- .9 Ensure that worksite copies of MSDS's are available to workers wishing to consult them and to the health and safety representative and/or joint health and safety committee.
- .10 Ensure that workers are instructed in the purpose and content of MSDS.
- .11 Provide prescribed information on any workplace controlled product, including confidential business information, to a doctor or nurse who needs it for diagnosis or emergency medical treatment.
- .12 WHMIS MSDS sheets to be kept on site at all times.

1.20 **REGULATING DOCUMENTS**

- .1 Refer to Section 01 41 00, Regulatory Requirements. Conform to applicable Codes and Building By-Laws. Conform to the requirements of the authorities having jurisdiction, such as public utilities.
- .2 Provide copies of documents referred to in the Specification for joint use of Contractor and Consultant, on site. Digital documents are acceptable.

1.21 CONTRACTOR'S RESPONSIBILITY

- .1 The Contractor will be responsible to take all necessary steps to protect personnel (workers, visitors, general public, etc.) and property from any harm during the course of the contract. The list of Contractor's responsibilities identified below is by no means comprehensive, nor is it in any priority or critical order. It is included here to identify the most often forgotten or ignored responsibilities of the Contractor and is intended as a reminder. The Contractor is responsible for all aspects and facets of the Project, from start to completion, from compliance with Occupational Health and Safety regulations to compliance with all codes and statutes.
- .2 The Owner may perform periodic monitoring to ensure that safety requirements are met, and that safety records are properly kept and maintained. Continued disregard for safety standards can cause the Contract to be cancelled and the Contractor removed from the site.
- .3 All work procedures and equipment shall be in accordance with Owner and Legislation standards.
- .4 All equipment shall be in safe operating condition and appropriate to the task.
- .5 Only competent personnel will be permitted on site. During the site introduction, the Owner will determine who is competent. The Contractor will cause to remove from the site any persons not observing or complying with safety requirements.

- .6 The Contractor shall comply with all Federal, Provincial and Municipal Safety Codes and Regulations and the Occupational Health and Safety Act. They shall insure that all of their Subcontractors, suppliers, installers, etc. comply with all applicable codes, regulations, and acts.
- .7 The Contractor shall supply competent personnel to implement their safety program and ensure that the Owner's standards, and those of the Occupational Health and Safety Act, are being complied with.
- .8 The Contractor shall report to the Owner and jurisdictional authorities any accident or incident involving personnel and/or property of the Contractor, Owner, or Public, arising from the Contractor's or any of their Subcontractors, execution of the work.
- .9 Provide the Owner with a copy of each site visit report by the Ministry of Labour, as soon as the report is issued.
- .10 The Contractor shall include all provisions of this contract in any agreement with Subcontractors, and hold all subcontractors equally responsible for safe work performance.
- .11 If the Contractor is responsible for a delay in the progress of the work due to an infraction of legislation or Owner Health and Safety requirements, the Contractor will, without additional cost to the Owner, work such overtime, and acquire and use for the execution of the work such additional labour and equipment as to be necessary, in the opinion of the Owner's Representative, to avoid delay in the final completion of the work or any operations thereof.

1.22 MANUFACTURER'S INSTRUCTIONS

- .1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.
- .2 Notify Consultant in writing of any conflict between these specifications and manufacturer's instructions. Consultant will clarify any such conflict when requested.

1.23 AIR, VAPOUR, AND THERMAL SEAL

- .1 Ensure that exterior windows, doors, and frames provide an air-tight and vapour-tight membrane to prevent problems due to building vapour migration.
- .2 In general, the air/vapour barrier must be achieved on the interior side of the thermal insulation.
- .3 The air barrier/vapour retarder membranes, together with flashings and sealants shall be adhered to existing, where present, to provide a continuous air barrier/vapour retardant envelope.

1.24 SAFETY REQUIREMENTS

.1 Comply with safety requirements outlined in Section 01 35 20.

1.25 TRUCKING COSTS

.1 The Contractor is responsible for all costs related to trucking required for the Contract. No extra costs will be considered for weight load or limits due to seasonal conditions or restrictions on load capacities imposed by any authorities or any similar limitations or factors.

1.26 **CONTINGENCY ALLOWANCE**

- .1 Include in the Contract Price a Contingency Allowance in the amount of **\$25,000.00**
- .2 Expend Contingency Allowance as directed by Consultant, in writing, in accordance with the General Conditions and Supplementary Conditions of the Contract.
- .3 Contractor's charges for expenses and profit on Contingency Allowance expenditure shall not be included in Contract Price. Such charges shall be added to the net trade cost of each expenditure from the Contingency Allowance at the percentage rates noted Section 10 24 00, Valuation of Changes.
- .4 Credit the contract with any unused portion of the Contingency Allowance in the final payment statement.

1.27 INDEPENDENT TESTS AND INSPECTIONS

- .1 The Contractor shall appoint inspection firms as directed by Consultant and make payments from the cash allowances specified in Division noted, except for the following, which shall be included in the contract.
 - .1 Inspection and testing required by laws, ordinances, rules, regulations or orders of public authorities.
 - .2 Inspection and testing performed exclusively for Contractor's convenience.
 - .3 Mill tests and certificates of compliance.
 - .4 Re-testing as described under the Quality Control subsection, below
- .2 The Consultant will authorize payment of inspection services from specified cash allowances.
- .3 Where tests or inspections reveal work not in accordance with Contract requirements, Contractor shall pay costs for additional tests or inspections as Consultant may require to verify acceptability of corrected work. In the case of soil compactions, the first retest only will be considered as part of inspection allowance.
- .4 The Contractor shall furnish labour and facilities to:
 - .1 Provide access to work to be inspected and tested.
 - .2 Facilitate inspections and tests.
 - .3 Make good work disturbed by inspection and test.
 - .4 Pour concrete test cylinders and store as directed by Inspection Firm.
- .5 Notify Inspection Firms sufficiently in advance of operations to allow for assignment of laboratory personnel and scheduling of test.

- .6 Where materials are specified to be tested, delivery representative samples in required quantity to testing laboratory.
- .7 Pay costs for uncovering and making good work that is covered before required inspection or testing is completed and approved by Consultant.

1.28 CASH ALLOWANCES

.1 Include in the Contract Price, a stipulated sum Cash Allowance in the amount of \$50,000.00, to be expended as outlined below, which shall apply to the following aspects of the Work:

Authorities Having Jurisdiction (fees, not deposits) Testing and Inspections Window Blinds (supply and installation)

- .2 Cash Allowances, unless otherwise specified, cover the net cost to the Contractor of services, products, construction, machinery and equipment, freight, handling, unloading, storage installation and other authorized expenses incurred in performing the Work.
- .3 The Contract Price, and not the Cash Allowance, includes the Contractor's profit in connection with such cash allowance.
- .4 The listing of a cash allowance in this section shall not be construed to imply the deletion from the base contract of any work which may be specified elsewhere. Where the expenditure of a cash allowance is not specifically outlined in the specifications, it shall be expended as per instructions and specifications to be provided by the Consultant at a later date.
- .5 The Contract Price will be adjusted by written order by the Consultant to provide for an excess or deficit to the Cash Allowance. Any unused portion of the allowance shall be returned to the Owner at the conclusion of the Contract.
- .6 A schedule shall be prepared by the Contractor to show when items called for under Cash Allowances are required, so that the progress of the Work is not delayed.
- .7 Expend cash allowances as directed by Consultant in writing. Allowances will be adjusted to actual cost with no adjustment to Contractor's charges. Cash expenditure must identify the H.S.T. separately.
- .8 Material Allowances
 - .1 Material allowances shall include the following:
 - .1 Net cost of material
 - .2 Applicable taxes and duties, excluding H.S.T.
 - .3 Delivery to site

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- .2 For Material Allowance, the contract shall include:
 - .1 Handling at site, including unloading, uncrating, storage and hoisting.
 - .2 Protection from elements, from damage.
 - .3 Labour, installation, and finishing.
 - .4 Other expenses required to do cash allowance work (ie contract co-ordination).
 - .5 Overhead and profit.
- .9 Material and Installation Allowances:
 - .1 Material and Installation Allowances shall include the following:
 - .1 Net cost of material
 - .2 Applicable taxes and duties, excluding H.S.T.
 - .3 Deliver to site
 - .4 Handling at site, including unloading, uncrating, storage and hoisting
 - .5 Labour, installation and finishing
 - .2 For Material and Installation Allowances, the contract shall include:
 - .1 Protection from elements, from damage
 - .2 Overhead and profit
 - .3 Other expenses required to do cash allowance work (ie contract co-ordination)
- .10 Testing and Inspection Allowances:
 - .1 Testing and Inspection Allowances shall include the following:
 - .1 Net cost of testing and inspection firm, and laboratory services, designated and authorized by Consultant.
 - .2 Applicable Taxes, excluding H.S.T.
 - .2 For Testing and Inspection Allowances, the contract shall include:
 - .1 Overhead and profit
 - .2 Supply of material tested
 - .3 Other testing and re-testing work specified
 - .4 Other expenses required to do cash allowance work (ie contract co-ordination)

1.29 WARRANTIES

.1 The following is a summary of the warranties required by the contract:

	# Years
General Contract	1
Caulking and Sealants	2
Aluminum Windows and Curtain Walls	5
Sealed Window Units	10
Glass and Glazing	10
Painting2	
Window Shades	3

.2 Additional warranties may be noted within the specification sections.

1.30 QUALITY CONTROL

- .1 The Consultants and authorized Owner staff shall have access to all areas of the Work, including any off site construction facilities.
- .2 The Contractor shall give timely notice requesting inspection if Work is designated for special tests, inspections, or approvals by the Consultants, or any other authorized Owner staff, or testing and inspection company.
- .3 If the Contractor covers, or permits to be covered Work that has been designated as outlined above, they shall uncover such work, have the inspections and tests satisfactorily completed and make good such work at no additional cost to the Owner.
- .4 The Consultants or the authorized Owner Staff may order any part of the Work to be examined, if such Work is suspected not to be according to the Contract Documents. If, upon examination, such work is found not to be in accordance with the Contract Documents, then the Contractor shall correct such Work and pay for cost of examinations and correction. If such Work is found to be in full accordance with the Contract Documents, the Owner shall pay for the cost of examination and making good.
- .5 If defects are revealed during inspection and/or testing, the appointed agency may request additional inspection and/or testing to ascertain the full degree of defects. The Contractor shall correct the defects and irregularities as reported by the inspection and/or testing agency, at no additional cost to the Owner and the Contractor shall pay all associated costs for retesting and reinspection.
- .6 The Contractor shall provide any tools, materials or equipment that may be required by the inspection and/or testing agencies in retesting the Work. (E.g. Video camera rental to reinspect incorrectly installed sewer lines.)
- .7 The employment of inspection and/or testing agencies does not, in any way, affect the Contractor's responsibility to perform the Work in strict accordance with the Contract Documents.
- .8 The Contractor shall remove all defective work, whether the result of poor workmanship by them or their subtrades, use of defective or damaged products, whether or not incorporated into the Work and any Work that has been rejected by the Consultants or authorized Owner Staff as failing to conform to the Contract Documents. Replacement and execution of the affected Work shall be done in full accordance with the Contract Documents, making good other trades' work damaged by such removals or replacements at no additional charge to the Owner.
- .9 If, in the opinion of the Consultant and/or the authorized Owner Staff, it is not expeditious to correct the defective Work, or Work not performed in accordance with the Contract Documents, the Owner, may, at its sole discretion, deduct from the Contract Price, the difference in value between the work performed and that required by the Contract Documents, the amounts of which shall be determined by the Owner.

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1.31 ENVIRONMENTAL DESIGN REQUIREMENTS

- .1 Indoor air quality is of major importance in the building. It is the intention of this Contract that the materials and products used be as low as possible in emissions of volatile organic compounds (VOCs). Low or no VOC products shall be used where these are available and suitable for the application. This is particularly of concern with regard to paints and other finishes, adhesives, sealants, and products manufactured using these materials.
- .2 Any cleaners, solvents, fuels, aerosol sprays and other chemical products used during construction should also be low VOC emitting where possible. Provide good ventilation when using any products that may emit VOCs.

1.32 **START-UP**

- .1 Work may start immediately upon receipt of Letter of Intent from Owner, and Contractors submission of start-up documents and insurance.
- .2 Refer to phasing requirements and critical dates specified above.

1.33 **PAYMENT PROCEDURES**

- .1 Refer to CCDC2 2008, Stipulated Price Contract, Part 5, Payment, and amendments included in the Supplementary Conditions included in the Owner's Request for Tender documents.
- .2 Before submitting first request for payment, submit a Schedule of Values, which shall be a detailed breakdown of the Contract price, as directed by the Consultant and as per the Owner's format. Breakdown must equal Contract price. After approval by Consultant, cost breakdown will be used as basis for progress payments.
- .3 Notwithstanding the amounts indicated on the Schedule of Values for the various aspects of the Work, the Owner reserves the right to retain additional funds for some items, where listed in the specifications. This includes amounts to be retained for maintenance manuals and for commissioning, as outlined in the applicable specification sections.
- .4 Applications for monthly payments shall be reviewed in rough draft form and approved by the Owner, Consultant and Contractor. This is to be done prior to the Contractor issuing their proper invoice. Submit a draft of each progress draw to the Consultant, with copy to the Owner, at least five (5) calendar days before the end of each month.
- .5 Submit progress photos to substantiate any work performed after the last field review by the Consultant.
- .6 Applications for payment shall list HST separately.

1.34 **REQUESTS FOR SUBSTITUTIONS**

.1 Products, materials, equipment, and methods of construction included in the Contract Documents are to be used in the execution of the Work of this Contract unless otherwise accepted by the Consultant in writing. Substitute products and materials may not be ordered or installed without written acceptance from the Consultant.

- .2 Changes proposed by the Contractor are considered requests for "Substitutions". Requests for Substitutions are to be submitted only by the Contractor.
- .3 Submit a complete package, including information and documentation outlined below, for evaluation by the Consultant.
- .4 A Request for Substitution must include the following information:
 - .1 Data sheets for both the specified item and the proposed substitution, enabling side by side comparisons.
 - .2 Complete description of the proposed alternative product or material, including:
 - .1 Laboratory tests results
 - .2 dimensions, gauges, weights, etc.
 - .3 An explanation of how the proposed substitute differs from the specified product
 - .1 in physical properties
 - .2 in quality and performance
 - .4 A list of any effects the proposed substitution would have
 - .1 on service connections (wiring, piping, ductwork, etc.)
 - .2 on the work of other trades
 - .3 on construction Schedules
 - .5 Evidence that manufacturers warranties and guarantees for the proposed substitutes are the same, or exceed those required under the Contract.
 - .6 Information on the availability of maintenance services and replacement materials for proposed substitute.
 - .7 Names, addresses, and phone numbers of fabricators and suppliers for proposed substitute(s).
 - .8 Confirmation that the proposed substitution, if accepted, would have no cost impact, or indication of a credit (or extra cost) associated with the substitution.
- .5 Submissions of Requests for Substitution must be received by the Consultant well prior to any shop drawing submissions. The Shop Drawing process is not an acceptable means of requesting a substitution, and submission of drawings for products that have not been accepted will result in the automatic rejection of the Shop Drawing submission.
- .6 The burden of proof of the merit of the proposed substitution lies with the Contractor.
- .7 Substitution requests deemed incomplete or incorrect by the Consultant will be rejected.
- .8 The Consultant may require the submission of further information in order to make an informed determination on the suitability of the proposed substitution. Allow a minimum of 10 working days, upon receipt of all required information, for the Consultant's decision. Substitutions requested too late, not allowing sufficient time for thorough review by the Consultant, will be rejected.
- .9 The Owner's decision, based upon recommendations of the Consultant, of acceptance or rejection, of a proposed substitution shall be final.

1.35 **PANDEMIC RESPONSE MEASURES**

- .1 When pandemic response measures are indicated by federal, provincial and/or municipal authorities, abide by all restrictions and protocols.
- .2 Provide measures to prevent the spread of COVID-19 in compliance with the Occupational Health and Safety Act and associated regulations and public health directives issued by the Chief Medical Officer of Health for the Province of Ontario.
- .3 Refer to Canadian Construction Association document, "COVID-19 Standardized Protocols for All Canadian Construction Sites" for best practices in responding to the COVID-19 pandemic.
- .4 The Contractor is responsible for the safety of all people entering the construction site including, but not limited to, workers, suppliers, delivery personnel, owner's representatives, consultants, testing and inspection personnel, building inspectors, and any visitors to site.
- .5 Provide signage at all entry points to the site, outlining the measures that are in place to combat the spread of COVID-19 at the work site. Provide additional signage and/or official posters outlining measures to be taken on site in site offices, sanitation stations, lunch areas, and other common work areas.
- .6 The following measures are recommended by the Ministry of Labour, Training and Skills Development and should be practised on site:
 - .1 Practice physical distancing and stay 2 metres from other people
 - .2 Conduct meetings outdoors
 - .3 Clean tools before and after use
 - .4 Clean toilets frequently
 - .5 Make hand washing or sanitizing stations easily available
 - .6 Disinfect facepieces and other personal protective equipment
 - .7 Stagger start and finish times
 - .8 Bag work clothes when bringing home laundry
- .7 Prepare an action plan outlining the COVID-19 response measures which will be undertaken on site. Prior to the commencement of Work on site, provide a copy of the action plan to the Owner and Consultant.
 - .1 Ensure that worksite policies related to the COVID-19 pandemic are made available on site and clearly communicated to all workers.

END OF SECTION

SECTION 01 24 00 - VALUATION OF CHANGES

PART 1 - GENERAL

1.1 GENERAL PROCEDURES

- .1 Changes in the Work ordered by the Consultant in accordance with the General Conditions of the Stipulated Price Contract shall be valued in accordance with the General and Supplementary Conditions of the Stipulated Price Contract and as more fully specified herein.
- .2 The standard documentation for effecting changes in the Work shall be as follows:
 - .1 Consultant's Notice of Contemplated Change issued to the Contractor on standard form and accompanied by necessary Drawings, Schedule, Details and Specifications.
 - .2 Contractor's Quotation submitted to the Consultant showing amount by which the Contract Sum shall be adjusted by way of increase or decrease if the change is ordered.
 - .3 Consultant's formal Change Order issued to the Contractor on Standard Form after Owner's approval. Formal Change Order becomes valid when signed by Consultant, Contractor, and Owner.
- .3 Where a change is not expected to result in an increase or decrease to the scope or cost of work, the Consultant may issue such change as a Jobsite Instruction. Should the Contractor determine that any part of a Jobsite Instruction will result in extra costs, or credits, they shall notify the Consultant, and request the issuance of a Notice of Contemplated Change for the relevant portion of the work. A Jobsite Instruction does not authorize work which will result in a change in the Contract Price.
- .4 Standard form of Jobsite Instruction, Notice of Contemplated Change and Change Order may be viewed at the Consultant's office during normal working hours.

1.2 VALUATION OF CHANGES

- .1 Quotations submitted by the Contractor in response to Consultant's Notice of Change shall be fully detailed and itemized to facilitate checking and processing by the Consultant. Quotations shall:
 - .1 List Work proposed to be carried out by Contractor's Own Forces showing labour, material, and equipment charges together with quantities and costs (unit rates if applicable) in the assessment of such charges.
 - .2 List Work proposed to be carried out by Subcontractors showing the amount quoted by each Subcontractor as verified by the Subcontractor's quotation which shall show labour, material, plant and equipment charges together with quantities and costs (unit rates if applicable) upon which the quotation is based.
 - .3 In evaluating a change, the net cost shall be the net difference in quantity between the original and revised Work. For example: If the change affects the omission of 3m³ and the addition of 4m³ of an item, the value of the change will be assessed by applying the net difference of 1m³ (extra) and applying the appropriate mark-up specified herein.

SECTION 01 24 00 - VALUATION OF CHANGES

- .2 Unit rates are only applicable if they have been accepted by the Owner in advance and included in the Contract.
- .3 Where unit rates are not established in the Contract, quote costs as follows:
 - .1 material prices shall be the net price paid by the Contractor (or Subcontractor) after deduction of all trade discounts and the like other than reasonable discount for prompt payment.
 - .2 plant and equipment costs shall not be more than rates quoted in the latest edition of "Rental Rates on Contractor's Equipment" published by the Canadian Construction Association.
 - .3 labour costs shall be the actual rate paid to the workers in accordance with the fair wage provision of the Contract plus a "fair wage burden" mark-up of thirty-eight percent to cover Welfare contribution, Pension contribution, Vacation Pay, Trade Improvement Fund, Promotional Fund, Training Fund, Supplementary Unemployment Benefits, Check Off, Apprenticeship, Trust Fund and similar labour contract payments; Worker's Compensation Insurance, Canada Pension Scheme and other statutory charges on labour..
- .4 "Overhead", means all expenses to carry on work, except items included in the cost as defined above, and shall include but shall not be limited to: use of Plant, tools; administrative and supervisory staff; personal vehicles, travel; bonds, insurance; health and safety protocols; and closeout submissions.
- .5 The maximum mark-ups for overhead and profit may be applied, as appropriate, to the net costs assessed as above where the effect of the proposed change is an increase in the Contract Sum. If the effect of the change is a decrease in the Contract Sum no mark-up shall be applied. Maximum mark-ups for overhead and profit shall be as set out in the Supplementary Conditions included in the Owner's Request for Tender documents.
- .6 When work deleted from the Contract is later added back into the Contract, additional overhead and profit will not apply to the reinstated work. Overhead and profit amounts are not included in credits and so remain included in the Contract amount.
- .7 Where overhead and profit mark-ups are to be modified:
 - .1 Where a change involves an extra/credit of more than \$20,000.00, smaller mark-up percentages must be negotiated to reflect a fair mark-up considering the volume of work involved.
- .8 It shall be understood and agreed that the mark-ups specified above shall be deemed to provide for payment in full for all items that in the custom of the Construction Industry in Ontario are considered to be site or head office overhead, profit, supervision, administration and labour costs.
- .9 Claims for extras will not be considered unless they can be verified by the Consultant. Site work, excavation, backfill, footings and all below grade work must be visually inspected by the Consultant and documented by an independent third party (ie Surveyor) BEFORE the work is hidden.

SECTION 01 24 00 - VALUATION OF CHANGES

- .10 The signing of a Change Order by all parties shall be deemed to be formal acceptance by the Owner of the Contractor's quotation. Following the issue of a Change Order the Owner will not entertain claims for extra payments due to errors alleged to have been made in the Contractor's Quotation.
- .11 Under no circumstances will a claim for extra be considered if it is for work recommended by the Inspection Company unless the Consultant has been advised and his approval obtained PRIOR TO THE EXECUTION OF THE WORK.

END OF SECTION

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 SITE SUPERVISOR

- .1 The Contractor shall be fully responsible for co-ordinating and expediting the work of all Subcontractors and shall employ a qualified Site Supervisor who shall be in full time attendance on this project.
- .2 Prior to the Preconstruction Meeting, the Contractor shall inform the Consultant of their choice for Site Supervisors and shall provide resumes outlining qualifications and related work experiences.
- .3 Site Supervisor shall have as a minimum:
 - .1 Recent, previous experience with renovation or addition projects involving occupied buildings including (but not limited to) school construction, sites with students, tenants, employees, customers, pedestrian and vehicular traffic.
 - .2 Successful completion of a multi-session Supervisor's training course conducted by a recognised Construction Association in Ontario.
- .4 The Supervisor must be assigned to projects for the duration of the construction period.
- .5 The Owner and the Consultant reserve the right to reject the proposed Supervisor should they feel that they are not fully qualified to assume the responsibilities of the positions.
- .6 There shall be a minimum of one full time Site Supervisor dedicated to the site.
- .7 Site Supervisor must carry a cell phone at all times during construction with the ability to be reached directly during all work hours and the ability to have voicemail recorded during all non-work hours including weekends and holidays.
- .8 Once the Supervisors are confirmed, there will be no change permitted without the written consent of the Consultant.

1.2 CONSULTANT/CONTRACTOR MEETING

.1 Prior to the commencement of the Work, the Contractor together with the Consultant shall mutually agree to a sequence for holding regular "site meetings" on same day (to be determined) of every second week.

1.3 **PRE-CONSTRUCTION MEETING**

- .1 Immediately prior to construction, upon notification, attend at location of Owner's choice, pre-construction meeting, along with authoritative representatives of certain key Subcontractors as specifically requested by the Consultant.
- .2 Purpose of meeting is as follows:
 - .1 Review project communications procedures.
 - .2 Review contract administration requirements including submittals, payment and change order procedures.
 - .3 Identify all critical points on Construction Schedule for positive action.
 - .4 Identify any product availability problems and substitution requests.

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SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

- .5 Establish site arrangements and temporary facilities.
- .6 Review any items which, in the Board's, Consultant's and Contractor's opinion, require clarification.
- .7 Exchange names & addresses of all key personnel representing Owner, Consultant, Contractor and Subcontractors.
- .8 Identify Consultant's inspection requirements.

1.4 **PROJECT MEETINGS**

- .1 Consultant shall Chair project meetings on Site, on a regular basis and will issue minutes to Owner's Representative, Consultants, and Contractor.
- .2 When restrictions are in place due to pandemic measures ordered or advised by Authorities, site meetings will be held virtually.
- .3 Consultant shall take minutes of meeting showing:
 - .1 List of persons attending.
 - .2 Decisions taken.
 - .3 Instructions required or issued Allocating responsibilities to action items.
 - .4 All matters discussed.
 - .5 Schedule Update Progress, Delays.
- .4 Contractor shall provide suitable on site accommodation for meeting, attend all meetings, arrange for attendance of all necessary Subcontractors, and distribute minutes of previous meeting to Subcontractors and Suppliers as appropriate.
- .5 The Contractor's representatives at site meetings must include the project co-ordinator as well as site Supervisor.
- .6 Contractor shall hold regular co-ordination meeting with Subcontractors and shall chair and minute each meeting. Copies of minutes shall be distributed to relevant Trades and Consultants and Owner.
- .7 In addition to jobsite meetings, Contractor shall arrange for, chair, and record safety meetings and regular meetings with his Subcontractors and suppliers. He shall distribute copies of the minutes of these meetings to all Subcontractors, Owner and Consultant.

1.5 ON SITE DOCUMENTS

- .1 The Contractor shall maintain the following documents, up to date, in the site office:
 - .1 Contract Documents
 - .2 Reviewed Shop Drawings Printed in full colour or redline
 - .3 All instructions and changes, i.e. Work Authorization, Jobsite Instructions, Notices of Contemplated Change, Change Orders, etc.
 - .4 All inspection and test reports
 - .5 Authorizations, approval documents, permits, special rulings, etc., issued for the project by Authorities Having Jurisdiction.
 - .6 Details of tested assemblies being used on the project; ULC, cUL, etc.
 - .7 As-Built drawings.

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

- .2 Documents listed above shall be printed, full size documents, not only digit format.
- .3 Maintain copies of Regulating Documents referred to in the specifications, up to date, in the site office.
- .4 Maintain a file of Material Safety Data Sheets (MSDS) for all materials being used on site and make available to all concerned, in the site office.

END OF SECTION

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 SCHEDULE

- .1 Within thirty (30) days of contract award, submit a detailed construction schedule. Base the submission on the commencement of completion dates of the Contract and indicate specified restraints and milestones, activities and durations for shop drawing submission and approval, testing, fabrication and delivery, construction sequence and timing, interdependencies and constraints. Include the procurement activities for major elements. Ensure the participation of all major Subcontractors and Suppliers.
- .2 Schedule shall show:
 - .1 Commencement and completion dates of Contract.
 - .2 Commencement and completion dates of stipulated stages if any.
 - .3 Commencement and completion dates of Trades.
 - .4 Order and delivery times for materials and equipment, where possible.
 - .5 Dates for submission of Shop Drawings, material lists and samples.
 - .6 Any other information relating to the orderly progress of Contract, considered by Contractor to be pertinent.
- .3 The schedule shall be reviewed and updated at every Site meeting.
- .4 Include with each update a written report of activity progress reflected in the revised Schedule, and the corrective actions which have been made or are to be taken to maintain progress on the schedule in the future, anticipated delays, resources availability, schedule changes, and work to be completed in the next 1 month period.

1.2 UPDATING AND MONITORING

- .1 Set up format of Construction Schedule to allow plotting of actual progress against scheduled progress.
 - .1 Allow sufficient space for modifications and revisions to the Schedule as Work progresses.
 - .2 Format shall be approved by the Consultant.
- .2 Display copy of Schedule in Site office during complete construction period and plot actual progress weekly.
- .3 Updating:
 - .1 Arrange participation, on Site and off Site, with Subcontractors and Suppliers, as and when necessary for the purpose of updating schedule and monitoring progress.
 - .2 Conduct reviews of progress and update schedule, distributing copies to Consultant, Owner and Sub-Trades at least once a month or as directed by Consultant.

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

1.3 **PROGRESS PHOTOGRAPHS**

- .1 Concurrently with monthly application for payment, submit 10 electronic format colour images as follows:
 - .1 Images shall clearly show overall progress of Work, and particularly work undertaken after the last field review of the month.
 - .2 Images shall be properly exposed and in focus; views shall be unobstructed. The Consultants will not accept images which are, in their opinion, substandard and these shall be retaken and resubmitted.
 - .3 Provide an index with printed images clearly identified with name of project, description of view and date taken. Disks are to be clearly labelled .

1.4 QUALITY OF WORK / STATUS REPORTS

- .1 The Contractor shall take full responsibility for the quality of work on site. The Contractor shall furthermore notify workers of deficient work immediately upon receipt of notification of deficiencies by the Consultant, Subconsultants and/or Owner.
- .2 The Contractor shall provide a monthly status report on the status of deficiencies identified by the Consultant and Subconsultants. The report shall include a description of each deficiency, status of the deficiency, description of corrective action taken, value (cost) to the correct deficiency and trade (person) responsible for deficiency. The report shall be typewritten on the Contractors letterhead. Submit monthly status reports with each progress draw.
- .3 After Substantial Performance, the Contractor shall continue provide the deficiency status reports on a monthly basis, including updated lists of deficiencies identified by the Owner and consultants.

END OF SECTION

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 **BEFORE COMMENCEMENT OF WORK**

- .1 Obtain the documents listed under this heading and supply to Consultant within the time stipulated in the Specification, or if not so stipulated, before issue of the first Certificate.
 - .1 Performance Bond/Labour and Material Bond.
 - .2 Insurance Policies required under General Conditions of Contract Insurance.
 - .3 Certificates of good standing from the Workplace Safety and Insurance Board for the Contractor and all Subcontractors.
 - .4 Shop Drawing Schedule.
 - .5 Permits for temporary structures, hoists, etc.
 - .6 Schedule of Values: Refer to General Conditions of Contract.
 - .7 Estimate of monthly progress claims (cash flow schedule).
 - .8 Construction Schedule.
 - .9 Equipment Delivery Schedule.
- .2 Concurrently, with schedule of values, submit cash flow schedule broken down on a monthly basis, indicating anticipated monthly progress billings for duration of the Contract.
- .3 Submit schedule in a format acceptable to the Consultant. Indicate anticipated submission dates and review periods. Highlight critical items.
- .4 Submit, in a format acceptable to the Consultant, a list of manufactured equipment complete with order dates, anticipated delivery dates, and dates required on site to meet progress schedule. Update schedule at least once a month or more often if directed by the Consultant. Clearly indicate late deliveries and anticipated impact on construction schedule. Include in schedule required delivery dates for products supplied by Owner.
- .5 Schedule of Values:
 - .1 Before submitting first request for payment, submit a detailed breakdown of the Contract price, as directed by the Consultant and as per the Owner's format. Breakdown must equal Contract price. After approval by Consultant, cost breakdown will be used as basis for progress payments.

1.2 DOCUMENTS AND ACTION REQUIRED DURING PROGRESS OF CONTRACT

.1 Perform the action and/or obtain the documents listed under this heading and supply to the Consultant, within the time stipulated in the Specification or, if not so stipulated, as soon as possible following Consultant's request.

SECTION 01 33 00 - SUBMITTAL PROCEDURES

- .2 Adjust Cash Allowances by award of separate Contracts, where appropriate.
- .3 Documents specified under Section 01 10 00, General Instructions and Section 01 33 23, Shop Drawings, Product Data and Samples.
- .4 Progress photographs, submitted concurrently with monthly application for payment. Refer to Section 01 32 00.
- .5 Any permits required from Authorities Having Jurisdiction enabling Owner to occupy the work (or part thereof) prior to Substantial Performance of the Contract.
- .6 As-Built Documents:
 - .1 The Owner requires as-built documents for all changes on completion of the construction.
 - .2 The Contractor shall obtain a complete and separate set of prints of Contract Drawings to keep on the site at all times.
 - .3 The drawing prints shall be marked up by responsible personnel of the Contractor and Subcontractors to record clearly, neatly, accurately and promptly showing all deviations from the contract documents.
 - .4 Prior to the date of Substantial Performance, request from the Consultant updated drawings incorporating all changes made to the building through Change Orders and Jobsite Instructions. Transfer all recordings from the white prints to these updated drawings and return them to the Consultant, as specified in Section 01 78 00, Close-out Submittals.
 - .5 Mark "as-built" changes in red coloured ink.
 - .6 Include electrical as-built information on as-built drawings. Indicate locations of electrical services, including new wiring, conduit, raceways, switches, and modifications to electrical panels.
 - .7 Clearly mark each of the drawings,"Project As-Built Record Copy".
 - .8 Final completion of these Drawings shall be a condition precedent to the issuance of Consultant's final payment certificate.

END OF SECTION

PART 1 - GENERAL

1.1 SCHEDULE

- .1 Within 5 working days after award of Contract, prepare and submit to Consultant for comment, a schedule fixing the dates for the submission of all Shop Drawings, product data, and samples.
- .2 Allow reasonable promptness for Consultant to review submissions, exclusive of time required for inter-office transmissions.
- .3 All shop drawings must be reviewed and stamped by the Contractor prior to submission to the Consultant.

1.2 GENERAL

- .1 Submit to Consultant, for review, Shop Drawings, Product Data, Samples, and other required submittals specified.
- .2 All shop drawings and related submittals must be reviewed and stamped by the Contractor prior to submission to the Consultant.
- .3 Until submittal is reviewed, Work involving relevant product may not proceed.
- .4 Do not use for construction, Shop or setting Drawings or diagrams which do not bear Consultant's stamp and name of reviewer.
- .5 Shop drawing reviews do not authorize changes in cost or time, which may only be accomplished by an appropriate Change Order issued through the Consultant.
- .6 Shop drawings shall be for products as specified or otherwise approved by the Consultant. The shop drawing process is not a means of requesting substitutions.
- .7 Submission and subsequent review of Shop Drawings constitute a service and does not entitle the Supplier or Subcontractor to the right to remuneration until the materials are supplied and installed on the Site in accordance with the Contract.
- .8 The Contractor must include for delivery and pick up of shop drawings to/from the Consultant by hand or courier.
- .9 The Contractor must include for reproduction of shop drawings <u>after</u> review by the consultants.

1.3 SHOP DRAWINGS

- .1 Drawings shall be copies of original drawings prepared by Contractor, subcontractor, supplier or distributor, for the work of the Contract which illustrate appropriate portions of the Work. Shop drawing submissions shall show pertinent information for incorporation of the products and equipment, including the following, as applicable:
 - .1 fabrication details
 - .2 dimensioned layout drawings, including clearances, with site dimensions
 - .3 relationship to adjacent work
 - .4 setting or erection details

SECTION 01 33 23 - SHOP DRAWINGS AND OTHER SUBMITTALS

- .5 performance requirements
- .6 operating weights of equipment
- .7 installation instructions
- .8 service connection requirements, including wiring diagrams
- .9 single line and schematic diagrams
- .10 additional information as may be specified in applicable Specification Sections.
- .2 Note that some shop drawings are required to be approved by a Professional Structural Engineer in the Contractor's employ.
- .3 Submit Shop Drawings with transmittal forms listing:
 - .1 the project name and number
 - .2 the names of the manufacturer, supplier, subcontractor
 - .3 the applicable Drawing numbers
 - .4 the number of copies
 - .5 the names of the items included the submittals
 - .6 number of Specification section to which the Shop Drawings refer
 - .7 dates and revision numbers, and submission numbers
- .4 All dimensions on shop drawings must be in metric.
- .5 On Shop Drawings for fire rated assemblies show required fire rating and ULC design numbers.
- .6 Submission:
 - .1 Submittals may be submitted by email.
 - .2 Submittals must be submitted in the same size and scale as they were originally prepared. Drawings may not be reduced in size for email transmission.
 - .3 Email submissions must be in pdf format and must be high quality documents, preferably generated by computer from the original documents (rather than scans of printed documents). If digital submissions are of insufficient quality, hard copies will be required.
 - .4 Emailed documents shall be reviewed and stamped digitally by the Contractor, or accompanied by a separate sheet from the Contractor listing the documents reviewed and bearing the Contractor's review stamp, along with copies of any revisions made.
 - .5 Email submission is only used as a convenient means of distributing drawings, in lieu of sending hard copies by courier. Reviewed drawings must still be printed for job site files, record copies, etc. All site copies shall be red line prints or colour prints.
- .7 If submitting printed submittals, submit copies as follows:
 - .1 Submissions shall be in sufficient quantities for distribution to all reviewers, plus one copy to be returned to the Contractor for reproduction and distribution.
 - .2 The prime Consultant requires one copy of every submission, of all disciplines.
 - .3 Each sub-consultant, of each discipline, will retain one copy of the shop drawings.

- .4 For architectural submissions which do not need to be reviewed by sub-consultants, only two copies are required.
- .8 Drawings shall be of a size and quality which will be readily reproduced. Shop drawings must be certified to have been reviewed and corrected by Contractor and sub-contractor responsible for forwarding to the Consultant.
- .9 Shop drawings are to be to scale. Scale shall be large enough to adequately review details included when printed full sized. Provide site measured dimensions on drawings wherever possible.
- .10 All requirements for shop drawings apply also to resubmissions of shop drawings, as may be required by the Consultant.
- .11 Revise all reviewed shop drawings to incorporate Consultant's comments. One complete set of final, revised Shop Drawings, used for construction, shall be submitted to the Consultant.
- .12 Shop Drawings are required for the following items:

Windows, Curtain Wall, including power operators Motorized and Manual Window Shades Other items as may be requested within the specifications

1.4 Refer also to the General Conditions of the Contract the Supplementary Conditions issued by the Owner in their RFT document.

1.5 **PRODUCT DATA**

- .1 Certain Specification Sections specify that manufacturer's standard schematic drawings, catalogue sheets, diagrams, schedules, performance charts, illustrations and other standard descriptive data will be accepted in lieu of Shop Drawings.
- .2 The above will be accepted if they conform to the following:
 - .1 Delete information which is not applicable to project.
 - .2 Supplement standard information to provide additional information applicable to project.
 - .3 Show dimensions and clearances required.
 - .4 Show performance characteristics and capacities.
 - .5 Show wiring diagrams and controls.
 - .6 Add to standard sheet the Project identification data.

1.6 SAMPLES AND MOCK-UPS

- .1 Where specified, shown or considered necessary, submit duplicate samples for Consultant's approval.
- .2 Where colour, pattern or texture is criterion, submit full range of samples.
- .3 Samples must correspond in every respect to materials supplied for project.
- .4 Construct field samples and mock-ups at locations acceptable to Consultant.

- .5 Construct each sample or mock-up complete, including work of all trades required to finish work.
- .6 Do not proceed with fabrication or delivery of materials until samples are approved.
- .7 Reviewed samples or mock-ups will become standards of workmanship and material against which installed work will be checked on project.
- .8 Approval of samples does not imply acceptance of finished work.

1.7 CONTRACTOR'S RESPONSIBILITY

- .1 Prior to submission to the Consultant, review all shop drawings, samples, product data, and other required submittals as follows:
 - .1 Verify that the submission is for products as specified, or otherwise approved by the Consultant.
 - .2 Ensure that the submission is complete.
 - .3 Note any potential interference issues and co-ordinate with the trades to avoid these conflicts.
 - .4 Verify:
 - .1 Field measurements.
 - .2 Field construction criteria.
 - .3 Catalogue numbers and similar data.
- .2 Coordinate each submittal with requirements of Work and Contract Documents. Refer to Section 01 10 00, General Instructions, and the subsection on Coordination.
- .3 Notify Consultant, in writing at time of submission of any deviations in submittal from requirements of Contract Documents.
- .4 Stamp, initial or sign each Drawing, certifying approval of submission, verification of field dimensions and measurements and compliance with Contract Documents, prior to submission to the Consultant(s).
- .5 The Contractor shall be responsible for reproducing and distributing reviewed shop drawings, except for those copies required by the Architect and Consultants.
- .6 After Consultant's review, distribute copies as follows:
 - .1 Job Site file (2 copies) colour or redline copies
 - .2 As-built documents file
 - .3 Other prime contractors
 - .4 Subcontractors
 - .5 Supplier
 - .6 Fabricator
 - .7 Authorities having jurisdiction, where required by Codes and/or By-Laws
 - .8 Owner's Maintenance Manual (revised, as-built copies)

- .7 Distribute samples as directed by the Consultant.
- .8 Ensure that all samples are approved by authorities having jurisdiction, supplier for correct application in Project, and other parties such as Owner in time to permit approval prior to ordering of quantity delivery to Site.
- .9 The Contractor shall advise all Trades, Subcontractors and suppliers of the limits of the Consultant's responsibility with respect to Shop Drawings and other submittals, as detailed below.

1.8 CONSULTANT'S RESPONSIBILITY

- .1 With reasonable promptness from the receipt of samples and Architectural shop drawings, the Consultant shall review them and return them to the Contractor. Allow 15 working days for review of shop drawings.
- .2 Review by the Consultant is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that the Consultant approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the processes or techniques of construction and installation and for co-ordination of the work of all subtrades.
- .3 Shop drawing markings shall be interpreted as follows:
 - .1 Shop drawings marked "REVIEWED" by Consultant and/or Subconsultants are released for construction.
 - .2 Shop drawings marked "REVIEWED AS NOTED" by the Consultant or his Subconsultants are also released for construction, after revisions noted are made; with final copies sent to the Consultant.
 - .3 Shop drawings marked "REVISE AND RESUBMIT" by the Consultant or his Subconsultants are NOT released for construction and must be resubmitted after being revised in accordance with the consultants' comments.
 - .4 Shop Drawings marked with the Consultant's "RECEIVED" stamp only have not been reviewed by the Consultant.
- .4 Review by the Architect does not in any way constitute review of the design of engineering elements, which form part of the Contract Document's prepared by others.
- .5 Shop drawings for products that are not a specified item, or an approved substitution, will be rejected without being reviewed.
- .6 Shop drawings which have not been requested will be returned to the Contractor with no action taken by the Consultant.
SECTION 01 33 23 - SHOP DRAWINGS AND OTHER SUBMITTALS

.7 The Architect will use the following stamps in reviewing Shop Drawings:



"Review by Moffet & Duncan Architects Inc. does not in any way constitute review of the design of engineering elements, which form part of the Contract Documents prepared by others."

MOFFET & DUNCAN ARCHITECTS INC.

REVIEWED	
REVIEWED AS NOTED	
REVISE AND RESUBMIT	

"This review by Moffet & Duncan Architects is for the sole purpose of ascertaining conformance with the general design concept. This review shall not mean that Moffet & Duncan Architects Inc. approves the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor submitting same, and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or his responsibility for meeting all requirements of the Construction and Contract Documents. The Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to fabrication processes or to techniques of construction and installation and for co-ordination of the work of all subtrades."

MOFFET & DUNCAN ARCHITECTS INC.

REVIEWED BY	
DATE	
PROJECT No.	

PART 1 - GENERAL

1.1 CONSTRUCTION SAFETY

- .1 Observe and enforce construction safety measures required by the National Building Code of Canada, Canadian Construction Safety Code, Ontario Occupational Health and Safety Act, Workplace Safety & Insurance board (WSIB) and Municipal Statutes and Authorities.
 - .1 The Contractor is reminded that the Contractor is responsible for Occupational Health and Safety on this project. The items listed below are only guidelines of the Owner's expectations in this regard and not to be construed to be comprehensive in nature.
- .2 In particular, the Ontario Construction Safety Act, the regulations of the Ontario Department of Labour and Ontario Hydro Safety Requirements shall be strictly enforced.
- .3 In event of conflict between any provisions of above authorities the most stringent provisions will apply.
- .4 The Owner will take every reasonable precaution to prevent injury or illness to students, employees and the public, participating in Owner activities, or performing their duties. This shall be accomplished by providing and maintaining a safe, healthy working environment and by providing the education necessary to perform these activities or duties safely.
- .5 The Owner is also vitally interested in the health and safety of Contractors and their workers performing work for the Owner. Cooperation and support of the Contractor in the protection of the workers from injury or occupational disease is a major, continuing objective of the Owner. To achieve these goals, the Owner, in concert with the Contractors, will endeavour to make every effort to ensure that the Contractors provide a work site which is a safe and healthy work environment. The Owner insists that all Contractors and their workers are dedicated to the continuing objective of reducing risk and injury.
- .6 The Contractor covenants and agrees to comply with all statutory and other obligations, including without limitation, the provisions of the Occupational Health and Safety Act (Ontario) and all Regulations thereto, and all amending and successor legislation, in connection with all work performed by either the Contractor, Sub-contractors, or any Other Contractor on, or in connection with, the Project.
- .7 Without limiting the foregoing, for the purposes of this Contract, the Contractor agrees that it shall be the "constructor" of the Project within the meaning of the Act, and as such, shall assume all the obligations and responsibilities, and observe all construction safety requirements and procedures, and duties of inspection imposed by the Act on the "constructor", as therein defined, for all work and services performed by the Contractor, Subcontractors and Other Contractors on or in connection with the Project. The Contractor further covenants and agrees that the Owner and its existing and former officers, trustees, employees and agents, and their respective heirs, executors, administrators, successors and assigns shall be released from any obligations or liabilities otherwise imposed on the Owner, or on any of them, pursuant to the Act in connection with the Project, and that the Contractor shall assume all liability and responsibility in connection with same. The Contractor agrees to save harmless and indemnify the Owner from any losses, damages, costs and expenses of any kind, or nature whatsoever, including all legal expenses, and all defence costs and related expert or consulting fees, incurred by the Owner, or any of them, arising in connection with the failure, default, or inability of the Contractor of the Owner, or any of them, to comply with any of the aforementioned statutory,

or other legal requirements, or arising in connection with any breach by the Contractor of any of its covenants, agreements and obligations under this Contract.

- .8 The Contractor shall inform and instruct Other Contractors that they, while performing work on this project, are under the authority of the Contractor. Other Contractors are to discuss and coordinate with, and follow instructions from, the Contractor on all matters of site access, vehicles, deliveries, storage, temporary facilities, coordination with the work of other subcontractors, work methods, scheduling, labour conditions, construction safety, environmental protection, security and all other matters which relate to the safe and proper execution of construction work.
- .9 The Contractor shall ensure that all supervisory personnel on job site are fully aware of the procedures and requirements outlined herein and comply with all requirements specified.
- .10 All contractors are responsible to ensure that all machinery and/or equipment are/is safe and that the workers perform their tasks in compliance with established safe work practices or procedures. Workers must receive adequate training in their specific work tasks to protect their health and safety.
- .11 The Contractor shall be responsible for all persons and companies performing work, including other Contractors, on this project, at all times, up to and including, the date of Substantial Performance of the Work. Authority for coordination and instructions relating to all matters which relate to the safe and proper execution of construction work shall rest with the Contractor. The Contract Price will include the Contractor's fees for the coordination and supervision of the work of all Other contractors.
- .12 In addition to the responsibility of all contractors as outlined in 1.1.10, above, Subcontractors will be held accountable for the health and safety of workers under their supervision.
- .13 Every worker must protect his/her own health and safety by working in compliance with the law and with safe work practices and procedures established by the authorities having jurisdiction.
- .14 All sections of the Occupational Health and Safety Act for Industrial Establishments, latest edition, and the Occupational Health and Safety Act for Construction Projects, latest edition, shall be enforced, by the Contractor, in their entirety, throughout the duration of the construction project.
- .15 The Contractor shall provide the Consultant with the telephone number where the Contractor or his representative can be reached at any time, day or night, for the duration of the contract.
- .16 Where an accident, explosion, or fire causes a person injury at the work place, and the worker is disabled from performing the usual task, the Contractor shall prepare a written notice and shall forward same to the Ministry of Labour within four days of the occurrence with a copy to the health and safety representative or the Joint Health and Safety Committee, containing such information and particulars as may be prescribed.
 - .1 Where a person is killed or critically injured from any cause at the work place, the Contractor shall immediately call the Ministry of Labour. A written notice from the Contractor shall be given to the Ministry of Labour within forty-eight hours after the occurrence, containing such information and particulars as may be prescribed, with copies to the Consultant and the Owner's Representative.

.2 The Contractor is advised that the accident scene is under the jurisdiction of the Ministry of Labour and no wreckage, articles, etc., shall be interfered with, disturbed, destroyed, altered or carried away at the scene, or connected with the occurrence, until the Ministry of Labour has given permission.

1.2 **REPORT ACCIDENTS**

- .1 Promptly report in writing to the Consultant all accidents which cause death, personal injury or property damage, arising out of or in connection with the performance of the work on or adjacent to the site. Where death or serious injuries or serious damages are caused, the accident shall be reported immediately by telephone or messenger to the Consultant and to the relevant public authorities.
- .2 If any claim is made by anyone against the Contractor or Subcontractor on account of any accident, the Contractor shall promptly report the facts in writing to the Consultant giving full details of the claim.

1.3 **FIRST AID FACILITIES**

.1 Provide at the site the equipment and medical facilities necessary to supply first-aid service to anyone who may be injured in connection with the Work, and to conform to the requirements of the authorities having jurisdiction over the Work.

1.4 **FIRE SAFETY REQUIREMENTS**

- .1 The appropriate clauses of the Ontario Building Code, Ontario Fire Code, National Building Code of Canada and National Fire Code relating to fire safety and protection shall be strictly followed.
- .2 Provide and maintain free access to temporary or permanent fire hydrants acceptable to local fire department.
- .3 Provide sufficient temporary standpipes and connections, fire hose, valves, temporary cabinets, extinguishers, etc. to comply with the requirements of the governing Municipal and Provincial authorities.
- .4 Make necessary adjustments and modifications to temporary fire protection as required during progress of the work. Remove such temporary work when permanent system is installed and operating.
- .5 Maintain fire safety in the existing building during construction, as follows:
 - .1 Maintain existing exits and access to exits. Where an exit must be blocked, provide an alternate exit acceptable to Authorities Having Jurisdiction.
 - .2 Where separations are provided between existing corridors in occupied spaces and new corridors under construction,, they shall be minimum 45 minute rated fire separations. Any required access through these partitions shall be with rated doors, frames with closers and latching.
 - .3 Maintain existing fire department access route or provide new, or temporary, access route acceptable to the fire department.

- .4 Do not store combustible materials adjacent to existing building or where such materials could pose a fire hazard to the building or the occupants.
- .5 Existing fire alarm system is to be kept operational throughout the construction period. Keep fire department informed of any temporary shutdowns and arrange for alternate fire safety measures to be implemented during that period.
- .6 Refer to the Ontario Fire Code for requirements for temporary shutdown of fire protections systems, including sprinklers and standpipe systems.
- .7 Modify Fire Safety Plan in accordance with the Fire Code, when required to facilitate construction. Such modifications shall be determined in cooperation with the Owner and the local fire department.

1.5 **OVERLOADING**

.1 Ensure no part of Work is subjected to a load which exceeds the design live loads shown on the structural drawings. Ensure that scaffolding and false work are not overloaded. Do not cut load bearing members without approval of Consultant.

1.6 **FALSEWORK**

.1 Design and construct falsework in accordance with CSA S269.1 latest version.

1.7 VISITORS

.1 Provide hard hats and safely vests for use by all visitors.

1.8 ADDITIONAL REQUIREMENTS FOR OCCUPIED SITES

.1 The existing school will be occupied throughout the academic year. When school is in session, additional safety requirements will apply, as outlined below:

.2 Flagman:

- .1 Provide a full-time flagman at each vehicular construction entrance.
- .2 The location of the Flagman shall be coordinated with the Owner, to ensure the safe guarding of staff, students, and the general public.
- .3 Flagman shall be a designated person, not the Site Supervisor or other construction worker, and shall not be changed during the Project unless approved by the Owner.
- .4 Flagman must have means of communication with Site Supervisor (phone or walkietalkie).
- .5 Flagman shall meet and escort all construction traffic from the street and for the entire time the vehicle is on site outside of a fenced construction enclosure. No unaccompanied construction vehicles will be permitted on School Board property, outside of a construction enclosure.
- .6 Flagman shall control construction parking at the school site. Parking shall be as designated by Owner and school Principal.
- .7 Flagman shall be properly outfitted to carry out his duties, with appropriate safety clothing and equipment, including reflective vest, hand-held "Stop" sign and a visible identification tag.

- .3 Access Control:
 - .1 The Contractor shall instruct all suppliers and subcontractors that they are required to contact the Site Supervisor by cell phone prior to entering the site, and await escort by the flagman.
 - .2 Site Supervisor shall then advise the flagman to meet and escort the vehicle.
 - .3 Gates of construction enclosure must remain closed and locked at all times and only opened for the time required for access/egress of authorized vehicles or personnel.
- .4 Site Communication
 - .1 The Contractor shall provide the Owner and Principal with an emergency contact telephone number at which the Site Supervisor or other Contractor representative can be contacted directly during work hours and with voicemail available at all other times, including weekends and holidays, which will be checked regularly.
 - .2 Site Supervisor and flagman must have means of direct communication available at all times during work hours.
 - .3 Contractor shall be in daily communication with the school Principal to determine any activities which may involve safety concerns, whether school related or construction related.

1.9 SIGNAGE

- .1 Provide signage indicating " Danger Keep Out", "Hard Hats must be worn at all times", "Safety Shoes must be worn at all times", "No Trespassing", etc., mounted on all sides of construction enclosures, and additional signs as necessary to adequately warn the public and workmen of the inherent dangers of the site and requirements to maintain personal safety. Safety Signage is also required at all construction entrances
- .2 During the school year, signage posted at site entrance shall state restrictions on hours of entry and egress, as agreed to by the Owner and Principal, and under no circumstances shall construction traffic be allowed within 30 minutes prior to school start, during recess, lunch break, and within 30 minutes after school dismissal.

1.10 PANDEMIC RESPONSE MEASURES

- .1 When pandemic response measures are indicated by provincial and/or municipal authorities, abide by all restrictions and protocols.
- .2 Refer to Section 01 10 00 for COVID-19 response measures required

SECTION 01 35 43 - HAZARDOUS MATERIALS

PART 1 - GENERAL

1.1 HAZARDOUS MATERIALS

- .1 The Ontario Occupational Health and Safety Act requires the Owner to provide a list of Designated Substances to all prospective Contractors and they in turn must supply the list to their sub-trades who are likely to handle or disturb the material.
- .2 The Owner will provide a survey of designated substances known, or likely, to be found in the building.
- .3 Materials that may be present in the area of construction may include any or all of the following and would be expected in normal construction of older buildings:
 - .1 Asbestos: in caulking, parging cement, insulation, drywall compound, acoustic ceiling tiles, vinyl asbestos floor tile.
 - .2 Lead: in paint films, in solder or pipe for drinking water, in solder for other pipe or electrical components
 - .3 Mercury : found in elemental form in an ampoule in thermostats or in electrical soft switches, as a gas in fluorescent light tubes or in paint films and caulk
 - .4 Silica: primarily as Quartz, bound in building materials including but not limited to concrete, brick and block.
- .4 In accordance with the Ontario Health and Safety Act and regulations enacted under the Act the Contractor and sub-trades shall take appropriate precautions for the building and their work force. Such precautions may include, for the substances listed, the measures outlined below.
- .5 Remove, transport, and dispose of hazardous materials in accordance with applicable laws, including the following:
 - .1 Occupational Health and Safety Act, R.S.O. 1990, c. O.1., including the following regulations made under the Act:
 - .1 O.Reg. 213/91, Construction Projects, amended to 345/15 and
 - .2 O.Reg. 278/05, Designated Substance Asbestos on Construction Projects and in Buildings and Repair Operations amended 479/10.
 - .2 Regulations for the transport of asbestos waste, including:
 - .1 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)
 - .2 Dangerous Goods Transportation Act, R.S.O. 1990, c. D.1
 - .3 Environmental Protection Act, R.S.O. 1990, C. E.19, and regulations under the Act, including:
 - .1 O.Reg. 102/94 Waste Audits and Waste Reduction Work Plans
 - .2 O.Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs
 - .3 R.R.O. 1990, Reg. 347: General Waste Management
- .6 Asbestos:
 - .1 If materials suspected to contain asbestos are disturbed during building demolition or new construction activities, they must be handled and disposed of in accordance with the procedures set out in O. Reg. 278/05.

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 35 43 - HAZARDOUS MATERIALS

- .2 It is expected that existing caulking in the oldest parts of the school could contain asbestos, which can be removed as Type 1 operations. Type 1 removals are to be included in the scope of Work of this Contract.
- .3 Should the Contractor or Subcontractors encounter other suspected asbestos containing materials in the course of their work, they shall immediately notify the Consultant and the Owner, who will arrange for inspection by an asbestos abatement consultant. Any additional abatement work will be done by forces appointed by the Owner.

.7 Lead:

- .1 Any operation involving lead-based paints may potentially produce significant exposures to lead if adequate controls are not provided. Exposure varies with the type of operation being employed.
- .2 The presence of lead in building finishes left intact or found peeling in a few locations produces little exposure for workers to lead through contact, inhalation or ingestion.
- .3 Operations involving the hand sanding and scraping of lead based paints can elevate exposure through inhalation. The use of a negative pressure respirator equipped with high efficiency particulate air (HEPA) filters is recommended to reduce exposure.
- .4 Operations involving the machine sanding or abrasive cutting of paint and other surface coatings containing lead can elevate levels of much finer dust. The spray application of a lead bearing paint or coating produces a respirable fume. These operations increase the likelihood of exposure by inhalation. A negative pressure air-purifying respirator equipped with HEPA filters is recommended for these operations.
- .5 Operations involving oxyacetylene torches or other heating operations produces the most significant exposure to lead in particular through inhalation and by contact of lead fumes solidifying on skin. A powered air-purifying respirator equipped with HEPA filters and full body covering is recommended for these operations.
- .6 Lead found in solder of other pipe systems and electronic components poses no threat to the work force by inhalation, ingestion or by contact with the exception of maintenance or renovation activities. The maintenance of the pipe or electrical component may produce some exposure to lead fume during the seating on of lead solders but for a short duration of time. Inhalation is the source of entry and exposure is not very significant.
- .7 All items identified in this section may be disposed of as regular non-hazardous waste unless concentrated. Metallic lead may be reclaimed through scrap metal dealers.

.8 Mercury

- .1 Fluorescent light tubes contain small quantities of mercury gas. These sealed units do not pose any harm in the workplace except in the case of breakage. There are no liquid or residue present after breakage and spill cleaning is not a concern. A recommended practice is to evacuate the work area when breakage occurs. The gas will diffuse in about five to ten minutes and cleanup of the tubes can be performed. Mercury can be taken into the body by inhalation only from this source.
- .2 The same precautions as those indicated for lead-based paints would apply to mercury in paints.
- .3 Elemental mercury found in ampoules in electrical equipment may be disposed of as regular waste and should be turned over to the Owner for disposal through commercial recyclers. The other forms (light tubes and painted surfaces that have been concentrated) can be disposed of as regular waste.

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 35 43 - HAZARDOUS MATERIALS

- .9 Silica
 - .1 Silica is presumed to be present in cement, cement blocks, bricks and mortar of the building. Unless the silica in these materials is reduced to respirable size (5 um or less) and the airborne concentration exceeds the time weighted average exposure of 0.2 milligrams per cubic metre in air, no adverse health effects are expected to occur. Building construction, renovation or demolition do not normally raise excessive exposure to silica with the exception of jack hammering, dry saw cutting or sand blasting. There is little likelihood for the work force to be exposed to excessive levels of respirable silica dust if the material is suppressed with water spray or flow. Respiratory protection is dependent on the type and airborne concentration of respirable silica present in the particular work environment.
- .10 Asbestos:
 - .1 Where a friable building material is found enclosed in a wall, floor or ceiling such as fireproofing, insulation on pipe or ducts etc. (that is not fibrous glass) or an acoustical textured material (stucco) or a non-friable material such as cement board or cement pipe, the Contractor shall refer to the Consultant who shall contact the Owner for further direction.
- .11 Prior to the disposal of building materials a leachate toxicity test in compliance with Water Management Regulation (Revised Regulation of Ontario 1990/Regulation 347) may be required by the local waster receiving site or the Ontario Ministry of Environment and Energy. Prior to disposal these authorities should be consulted with, and tests performed where required.

SECTION 01 41 00 - REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 **REGULATING DOCUMENTS**

- .1 Conform to the Ontario Building Code (Ontario Reg. 332/12), Ontario Fire Code (Ontario Reg. 213/07), Accessibility for Ontarians with Disabilities Act (Ontario Reg. 191/11), National Building Code of Canada, Canadian Electrical Code (CEC), CSA W59 Welded Steel Construction, The Occupational Health and Safety Act, Ontario (R.S.O. 1990), the National Fire Code, the local municipal Fire Code, and all other applicable Codes and Building By-Laws.
- .2 Conform to the requirements of the authorities having jurisdiction, such as public utilities.
- .3 Contract forms, codes, standards and manuals referred to in these specifications are the latest published editions at the date of close of tenders. Meet or exceed requirements of specified standards.
- .4 Provide copies of documents referred to in the Specification for joint use of Contractor and Consultant, on site.

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

PART 1 GENERAL

1.1 **DESCRIPTION**

- .1 This section describes typical abbreviations and acronyms used in these specifications and on the drawings and schedules.
- .2 When references are made in these specifications to the standards, specifications, or other published data of various international, national, regional, or local organizations, such organizations may be referred to by their acronym or abbreviation only.
- .3 The list of abbreviations and acronyms is provided to aid in the interpretation of notations in the construction documents and shall not be used to alter the meaning of notes for which the meaning is readily inferable from the context.
- .4 Abbreviations and acronyms can have more than one meaning. Their use shall be considered with respect to different subjects and disciplines where the context in which each is used makes the meaning clear.
 - .1 Example:
 - .1 CB on floor plans typically refers to a chalkboard
 - .2 CB on site plans typically refers to a catchbasin
 - .3 CB on electrical plans typically refers to a circuit breaker
- .5 Where additional or alternate abbreviations and acronyms are listed and used on drawings, schedules, and in the specification sections prepared by subconsultants, those shall apply to the documents on which they are noted.
- .6 Discrepancies shall be noted and brought to the Consultant's attention for interpretation.

1.2 LIST OF ABBREVIATIONS

А		В	
AB	Air Barrier	BD	Board
A/B	Anchor Bolt	BEV	Bevelled
AC	Air Conditioning	BF	Barrier-free
ACT	Acoustic Ceiling Tile	BH	Bore Hole
ADD	Addendum	B/H	Bulkhead
ADJ	Adjustable	BIT	Bituminous
AFF	Above Finished Floor	BLDG	Building
AFG	Above Finished Grade	BLK	Concrete Block
AHU	Air Handling Unit	BM	Beam
ALM	Alarm	B/M	Bench Mark
ALUM	Aluminum	BN	Bull Nosed
AMP or A	Ampere	BOT	Bottom
ANN	Annunciator Panel	BP	Bearing Plate
ANO	Anodized	BRDG	Bridging
AODA	Accessibility for Ontarians with	BRK	Brick
	Disabilities Act	BTU	British Thermal Unit
APPROX	Approximate	BUR	Built-up Roofing
AUTO	Automatic	BV	Block Vent or Brick Vent
A/V	Audio Visual or Air/Vapour		
AVB	Air/vapour Barrier		
AWT	Acoustic Wall Treatment		
AWU	Acoustic Wall Unit		

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

C °C CAB CAP CAR CB C/B CBMH C/C CEC	Degrees Celsius Cabinet Cementitious Acoustic Panel Carpet Chalkboard, or Catchbasin Catchbasin Catchbasin Manhole Centre to Centre	DIM DISP DL DN DSP DVTL DRY DW DWG	Dimension Dispenser Door Louver Down Downspout Dovetail Joint Dryer Dishwasher Drawing
CEM CER CGA CH CJ CL CLF CLF	Cement Ceramic Canadian Gas Association Cabinet Heater Control Joint Centre Line Chain Link Fence Cailing	E EF EC ECS EJ EL ELEC ELEC	Each Face or Exhaust Fan Emergency Call Emergency Call Signal Expansion Joint Elevation Electrical
CLG CLR CMU COL CONC CONSTR CONT CONTR	Clear Clear Concrete Masonry Unit Column Concrete Construction Continuous Contract or Contractor	ELEV EQL EQ/T EQPT EX EXH EXP EXP STR	Equal Equivalent Thickness Equipment Existing Exhaust Expansion Exposed Structure
CONV CORR CP CPT CR CS CSA C/S	Convector Corridor Control Panel Carpet Coat Rack Convenience Shelf Canadian Standards Association	F F1 FA FARA FBD FD F/D	Frame Type 1, etc. Fire Alarm Fall Arrest Roof Anchor Fibreboard Floor Drain Fire Damper
CT cUL CTR CV CW CW1 C/W	Ceramic Tile UL Certified for Canada Centre Condom Vendor Curtain Wall Curtain Wall Type 1, etc. Complete with	FDC FDN FEC FFL FG FH FHC	Fire Department Connection Foundation Fire Extinguisher Cabinet Finish Floor Level Fixed Glass Fire Hydrant Fire Hose Cabinet
DAMP DAT DBL DEMO DET DF DIA DIAG DIFF	Dampproofing Datum Double Demolish or Demolition Detail Drinking Fountain Diameter Diagonal Diffuser	FIN FIX. FLG FLEX FLUOR FPR FR FRG FRR FS FTG FURR	Fixture Flashing Flexible Fluorescent Fire Protection Rating Fire Retardant/rated Fire Rated Glass Fire Resistance Rating Fire Separation Footing Furring

MONSIGNOR JOHN PEREYMA C.S.S. WINDOW REPLACEMENT 2021

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

G GA GALV GB GL GRB GVL GYP BD GWG	Gauge Galvanized Gypsum Board Glass Grab Bar Gravel Gypsum Board Georgian Wired Glass	LIB LINO LLH LLV LNTL LONG LPT LMC LS L/S	Library Linoleum Long Leg Horizontal Long Leg Vertical Lintel Longitudinal Low Point Linear Metal Ceiling Light Standard Litres per Second
H HB HC HD HM HOD	Hose Bibb Handicapped Hand Dryer or Heavy Duty Hollow Metal Hold Open Device	LSA LVL LV-1 LWB LWC	Lateral Support Angles Level Louvre (Type 1) Light Weight Block Linear Wood Ceiling
HP HR HRD HTD HVAC HWT HYD	Horsepower Hour Hair Dryer High Traffic Doors Heating, Ventilation and Airconditioning Hot Water Tank Fire Hydrant	M M1 MAX MDF MECH MEMB	Metres Masonry Type 1 or Mirror Type 1, etc. Maximum Medium Density Fibreboard Mechanical Membrane
I ID IGU INS INSUL ISOL	Inside Diameter Insulated Glass Unit Insulation Insulate Isolation	MET MEZZ MH MIN MIRR MISC MLWK	Metal Mezzanine Manhole Minimum Mirror Miscellaneous Millwork
J JB K	Junction Box	MM MO MOD BIT MR MTD	Millimetres Masonry Openings Modified Bituminous Moisture Resistant Mounted
KG kPA	Kilogram Kilopascal	MUL MWP	Mullion Membrane Waterproofing
LAB LAM LAT LAT-1 LAV LB LBL	Laboratory Laminate Lay-in Acoustical Tile Lay-in Acoustical Tile (Type 1) Lavatory Pounds Label	N NAT NBCC NEMA NFHB NFPA	Natural National Building Code of Canada National Electrical Manufacturers Association Non-freeze Hose Bibb National Fire Protection Association
LDBR LDG LED LF LH LHR	Load Bearing Landing Light Emitting Diode Light Fixture Left Hand Left Hand Reverse	NIC NO. NOM NSF NTS	Not in Contract Number Nominal National Sanitation Foundation Not to Scale

Moffet & Duncan Architects Inc.

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

0		R	
04	Overall	R	Badius
	Ontario Building Code	RΔ	Beturn Air or Boof Anchor
			Radiator
	On Centre		Rubber Rese
			Reflected Colling Plan
0/H	Overhead		
OHS	Overhead Stop	RD	Roof Drain
OWSJ	Open Web Steel Joist	REBAR	Reinforcing Bar
OV	Oven	RCONV	Recessed Convector
		RCH	Recessed Cabinet Heater
Р		REC	Recessed
Р	Paint	REF	Reference / Refer
PAP	Prefinished Aluminum Panel	REFR	Refrigerator
PA	Public Address System	REINF	Reinforce/d/ing/ment
PAR	Parallel	REM	Remove or Removable
PB	Push Button (Door Operator)	RES	Resilient
PBD	Particleboard	REV	Revise / Revision
PC	Precast Concrete	RFG	Roofing
PE	Porcelain Enamel	RFS	Room Finish Schedule
PFR	Perimeter	RH	Right Hand
PFRF	Perforated	R/H	Roof Hopper
PERIM	Perimeter	RLG	Railing
PERP	Perpendicular	RM	Room, or Recess Mounted
PG	Plate Glass	RMC	Reinforced Masonry Column
	Phase or Potential of Hydrogen	RSF	Resilient Sheet Flooring
DI	Plactor	RTSF	Rubber Tile Sport Flooring
	Plastic Laminato (also P LAM)	RPF	Resilient Plank Flooring
	Dumbing	RUBB	Rubber
	Physicad	RUH	Recessed Unit Heater
	Profinished Matel Electrica	RWL	Rainwater Leader
	Prefinished Metal Siding		
PIVIS	Pretimished Metal Siding		
PIVIP	Pretinished Wetal Panel		
PINL	Panei Del este les este Del este fin		
POLY	Polyethylene or Polyoletin		
PR	Pair		
PREFIN	Prefinished		
PRELIM	Preliminary		
PSI	Pounds per Square Inch		
PT	Porcelain Tile, or Paint		
PTD	Paper Towel Dispenser		
PTN	Partition		
PTW	Preservative Treated Wood		
PVC	Poly Vinyl Chloride		
PVG	Paving		
PWC	Plastic Wall Covering		

Q

QT Quarry Tile

MONSIGNOR JOHN PEREYMA C.S.S. WINDOW REPLACEMENT 2021

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

Stain (Type) 1
Security Alarm Device
Sanitary
Security Contact or Solid Core
Schedule
Soap Dispenser
Static Dissipative Flooring
Special Epoxy Coating
Safety Flooring
Similar
Sink
Slate
Sanitary Napkin Disposal
Sanitary Napkin Dispenser
Slab on Grade
Spandrel Panel
Specifications
Special Coating
Sports Flooring
Speaker
Square
Semi Recessed Convector
Slip Resistant Flooring
Stainless Steel
Steel
Stainless Steel
Staggered
Sound Transmission Class
Standard
Stiffener
Storage
Structure or Structural
Storage Unit
Supplement/al
Surface
Surface Suspended
Surface Suspended Sheet Vinyl Flooring
Surface Suspended Sheet Vinyl Flooring Sidewalk
Surface Suspended Sheet Vinyl Flooring Sidewalk Special Wall Finish

Т	
TB	Tackboard
T&B	I op and Bottom
IBD	To Be Determined
	Teacher's Closet, or Top of Curb
TEC	Tectum Panel
1&G	Longue and Groove
	Tempered Glass
	l errazzo
	Telephone
	Temporary or Tempered
	Test Hole
	Top of Curb
TOCS	Top of Concrete Slab
TOCS	
	Top of Steel Toilot Papar Dispansor
TPG	Tompored Plate Glass
TR	Transom
TVP	Typical
	rypical
U	
U/C	Undercut
U/G	Underground
UH	Unit Heater
UL	Underwriter's Laboratories
ULC	Underwriter's Laboratories of Canada
UNEX	Unexcavated
UNF	Unfinished
UNO	Unless Noted Otherwise
U/P	Unpainted
UU	Urinal
U/S	Underside
UTIL	Utility
V	
V	Volte
V	vuits Variable Varies
	Vandule, Valles Vandur Barrier
VCT	Vinyl Composition Tile
VERT	Vertical
VEST	Vestibule
VE	Vinyl Faced
VR	Vanour Retarder
VT	Vinyl Tile
	Vinyl Wall Panel
VVVF	

SECTION 01 42 13 - ABBREVIATIONS AND ACRONYMS

W	
W1	Window Type 1, etc.
W/	With
WAP	Wood Acoustic Panel
WASH	Washing Machine
WB	White Board
WC	Watercloset (Toilet)
WD	Wood
WDF	Wood Flooring
WF	Wash Fountain
WG	Wired Glass
W/O	Without
WP	Waterproofing, Working Point
WR	Washroom
W/R	Water Resistant
WSF	Wood Sports Flooring

SECTION 01 43 00 - QUALITY ASSURANCE

PART 1 - GENERAL

1.1 **QUALITY ASSURANCE**

- .1 Refer also to the Quality Control Provisions of Section 00 10 00, General Instructions.
- .2 Provide a system of quality control to ensure that the minimum standards specified herein are attained.
- .3 Bring to the attention of the Consultant any defects in the work or departures from the Contract Documents which may occur during construction. The Consultant will decide upon corrective action and state recommendations in writing.
- .4 The Consultant's general review during construction and inspection by independent inspection and testing agencies reporting to the Consultant are both undertaken to inform the Owner of the Contractor's performance and shall in no way augment the Contractor's quality control or relieve him of contractual responsibility.

1.2 **NOTIFICATION**

.1 Give the Consultant advance notice of shop fabrication, field erection and other phases of the work so as to afford him reasonable opportunity to inspect the work for compliance with contract requirements.

1.3 DEFECTIVE MATERIALS AND WORKMANSHIP

- .1 Where factual evidence exists that defective workmanship has occurred or that work has been carried out incorporating defective materials, the Consultant may have tests, inspections or surveys performed, and the like in order to help determine whether the work must be replaced. Test, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may indicate that, in the Consultant's opinion, the work may be acceptable.
- .2 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would, in the Consultant's opinion, cause undue delay or give results not representative of the rejected material in place. In this case, the tests shall be conducted in accordance with the standards given by the Consultant.

SECTION 01 51 00 - TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 **TEMPORARY COMMUNICATIONS**

.1 Install and pay for all communications services on site, including telephone, internet, computer, and printer, for Contractor's own use, and for the Owner's and Consultant's use.

1.2 **POWER AND WATER SUPPLY**

- .1 Provide all temporary light and power complete with all wiring, lamps and similar equipment as required for completion of the Work. Provide adequate lighting for all workmen, sufficient for safety and for execution of good workmanship, taking particular care to observe all safety requirements. Adequate temporary lighting will be insisted upon. The Owner will not be liable for any loss, damage, delay, or claims for extra costs resulting from lack of services.
- .2 Existing building services may be used, as available. This does not include emergency generators or batteries.
- .3 Provide an adequate pure fresh water supply for the use of trades.
- .4 Ensure continued water and power supply to the building and adjacent residences and buildings throughout the construction period.

1.3 TEMPORARY VENTILATION

- .1 Provide local exhaust ventilation to prevent harmful accumulations of hazardous substances into atmosphere of occupied areas. Dispose of exhaust materials in manner that will not result in harmful exposure to persons.
- .2 Ventilate storage spaces containing hazardous or volatile materials. Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements. Store paints and solvents in secure, locked, ventilated room at all times.

1.4 **REMOVAL OF TEMPORARY UTILITIES**

.1 Remove temporary utilities from site when directed by Consultant and/or at the completion of the project.

1.5 **FIRE EXTINGUISHERS**

.1 An adequate number of ABC type fire extinguishers shall be provided for the protection of the work during construction.

SECTION 01 52 00 - CONSTRUCTION FACILITIES

PART 1 - GENERAL

1.1 CONTRACTOR'S SITE OFFICE

- .1 Provide and maintain a site office for site conference and job meetings. When school is not in session, a room will be made available in the school for the Contractor's site office.
- .2 The Contractor shall maintain the following documents, up-to-date, in site office:
 - .1 Contract Documents
 - .2 Reviewed shop drawings
 - .3 All instructions and change documents, ie Work Authorizations, Jobsite Instructions, Notices of Contemplated Change, Change Orders
 - .4 All inspection and test reports
 - .5 Permits and related drawings
 - .6 As-built drawings

1.2 STORAGE SHEDS

- .1 Provide adequate weather-tight sheds with raised floors, for storage of materials, tools and equipment which are subject to damage by weather.
- .2 Storage sheds shall be painted and doors shall be fitted with locks.
- .3 Locate storage sheds adjacent to building away from road to approved of the Consultant.
- .4 Material stored on site must be protected by tarpaulins until enclosed in building.

1.3 SANITARY FACILITIES

- .1 Furnish and maintain in a sanitary condition, suitable painted building containing adequate sanitary accommodation for all workers in accordance with local Municipal and Provincial sanitary regulations, and to the approval of Public Health Authorities and the Consultant, with all necessary water, sewage, light and heat supplied in sufficient quantity. The use of single portable serviced units will be permitted providing siting is approved.
- .2 When the school is vacated for the summer break, one designated washroom within the building will be assigned for the Contractor's use.
- .3 Post notices and take such precautions as required by local health authorities. Keep area and premises in sanitary condition.
- .4 Refer to Section 01 10 00 for pandemic protocols.

1.4 **REMOVAL OF TEMPORARY FACILITIES**

.1 Remove temporary facilities from site when directed by Consultant and/or at the completion of the project.

SECTION 01 56 00 - TEMPORARY BARRIERS AND CONTROLS

PART 1 - GENERAL

1.1 SITE ENCLOSURE AND PROTECTION

- .1 Install temporary fencing to secure work areas. No construction work may be undertaken on an unsecured site.
- .2 Construction enclosures must be installed when building is vacant. All other temporary barriers and controls located outside of the construction enclosures must also be installed when the building is vacant. Coordinate with Owner.
- .3 Enclose work areas to conform with current legislation and safety standards. Provide temporary 1.8m high galvanized chainlink fencing, complete with gates as required for site access.
- .4 Erect enclosures so as to provide a secure compound for construction equipment and supplies. Hold the Owner harmless from any damage or expense arising from failure to properly execute such work.
- .5 Provide, erect, and maintain enclosures for construction as required for safety or as otherwise agreed to with the Consultant, or as directed by Authorities Having Jurisdiction. Confirm that hoarding is designed to resist wind loads.
- .6 Gates to be kept locked except during working hours.
- .7 On completion of the contract, take down and remove enclosures and gates from the site.

1.2 SITE PROTECTION

- .1 Supply, install and maintain all guard rails, barriers, night lights, sidewalk and curb protection as may be necessary or as the by-law may require.
- .2 Supply, install and maintain all necessary temporary doors, screens and coverings to protect work areas. All such work shall be neatly painted. Doors shall have hasp and substantial padlock. Owners representative shall have key or combination where access is required. Provide and maintain temporary fencing at excavations, etc. as required for safety. Protect existing asphalt and concrete paving and curbs from damage and make good any damage at completion of project.
- .3 Protect building and construction materials from cold weather and rain. Protect all of the work from damage by the elements.
- .4 Properly protect floors and roofs from any damage. Take special precautions when moving heavy loads or equipment over floors and roofs.
- .5 Keep floors free of oils, grease or other such materials likely to discolour them.
- .6 Ensure that no part of the Work is loaded greater than it was designed for, when completed. Make any temporary support as strong as the permanent support.
- .7 Protect glass and other finishes, using appropriate protective shields and covers.

DIVISION 01- GENERAL REQUIREMENTS

SECTION 01 56 00 - TEMPORARY BARRIERS AND CONTROLS

- .8 Provide and maintain, in good working order, appropriately labelled ULC fire extinguishers, to the approval of Authorities Having Jurisdiction.
- .9 Provide a minimum of two safety helmets and two safety vests on site at all times for the use of any other Owner authorized visitors to the site. It is the Contractor's responsibility to make certain that any such visitors wear the protective headgear and any other safety gear which may be necessary at that particular time of construction.
- .10 Should the job be stopped for any cause, the Contractor shall be responsible for and provide all necessary protection to prevent damage by weather or other cause until the cause of stoppage has been cleared.
- .11 The Contractor shall be entirely responsible for supervision of project and for protection of public from vehicles in movement, stockpiled materials and construction.
- .12 The Contractor is responsible for the prevention of vandalism and theft of all tools, equipment and materials.
- .13 Any damage to roadways must be repaired immediately, to municipal standards.
- .14 The Contractor is responsible for snow removal in work areas.
- .15 Any damage to site by the Contractors forces, delivery vehicles, etc., must be made good at the end of the job. Similarly any damage to curbs, sidewalks, or other municipal property shall be made good by the Contractor.

1.3 OVERHEAD PROTECTION

- .1 Provide overhead protection at each access point into the building addition during construction.
- .2 Provide overhead protection at temporary and existing building exits adjacent to construction enclosure.
- .3 Overhead protection shall be constructed to support loads of 2.4 kN/m², of suitable materials for the design load and for the intended purposes.

1.4 **TEMPORARY DUST CONTROLS**

- .1 Supply and install temporary dust proofing measures in the existing school prior to any work taking place in each area. Call for review by Owner/Consultant after dust proofing measures are installed.
- .2 Dust proofing measures shall include the following:
 - .1 Cover floor and furnishings with heavy duty plastic or fabric drop cloths.
 - .2 Where possible erect dust proof enclosures around work area to limit the spread of dust, dirt and debris. Enclosures shall consist of steel stud framing to underside of structure above, covered with plywood sheathing and min. 10mm polyethylene sheets, caulked around perimeter.
 - .3 Place filters in return air vents in all work areas to prevent dust from entering the existing HVAC system.

SECTION 01 56 00 - TEMPORARY BARRIERS AND CONTROLS

- .4 Clean and vacuum daily to prevent the spreading and tracking of dust and dirt to other areas.
- .3 Dust proofing shall be as acceptable to Owner and Consultant.
- .4 Dust proofing shall be installed outside of school operating hours and shall remain in place until the new Work is finished in the area, and accepted by the Owner.
- .5 Minimize the amount of dirt tracked into the existing building. Provide mats at all entrances used by construction personnel to enter the school.
- .6 Keep dust, dirt, and debris away from fresh air intakes, open doors and windows, and from areas where it could be tracked into the building by students, staff, or visitors to the school. Assume responsibility for cleaning up all dirt, debris, mud, water, snow, etc., tracked in by construction personnel.

1.5 MAINTAINING INDOOR AIR QUALITY

- .1 Smoking is not permitted inside the building or on the school property at any time. The Contractor shall post "No Smoking" signs throughout the work areas to enforce this requirement.
- .2 Minimize the time that vehicles are left idling on site. Keep idling vehicles away from open doorways and windows, open areas of the building addition, fresh air intakes, and areas where students are gathered.
- .3 All adhesives, sealants, paints and coatings applied onsite must be low VOC products.
- .4 Products requiring the use of adhesives, sealants, paints and other coatings, are to be assembled offsite as much as possible. Such adhesives, sealants, and coatings shall be low VOC products, where suitable products are available.
- .5 No toxic chemicals or fuels are permitted to be stored inside the building.
- .6 Refueling of equipment is to be undertaken outside the building.
- .7 Gas powered equipment is not to be used inside the building. Use electric or propane powered equipment only, and to acceptance of Owner and Consultant.

1.6 SECURITY

- .1 The Contractor shall be entirely responsible for supervision of project and for protection of public from vehicles in movement, for stockpiled materials and construction. Vehicular parking and stockpile materials must be maintained on the construction site only. No street parking or stockpiling will be allowed on the Municipal streets.
- .2 The Contractor is responsible for the prevention of vandalism and theft of all tools, equipment and materials until date of Substantial Performance of Contract.
- .3 The Contractor shall provide security on site during construction, until re-occupancy of the building by the Owner.

DIVISION 01- GENERAL REQUIREMENTS

SECTION 01 56 00 - TEMPORARY BARRIERS AND CONTROLS

1.7 **ROOF PROTECTION**

- .1 Protect roof areas from foot traffic and placement of equipment and / or materials on roof.
- .2 Protection shall be in the form of wood planks and / or plywood, weighted down securely by means of sand bags or similar materials.

1.8 **REMOVAL OF TEMPORARY BARRIERS**

.1 Remove temporary barriers and enclosures from site when directed by Consultant and/or at the completion of the project.

SECTION 01 71 23 - FIELD ENGINEERING

PART 1 - GENERAL

1.1 MOBILIZATION ON SITE

.1 At the time of mobilization or immediately thereafter, the Contractor is to confirm in writing that the building and site are visually in general conformance with the descriptions in the documents.

1.2 **DIMENSIONS**

- .1 Ensure that necessary job dimensions are taken and trades are co-ordinated for the proper execution of the work. Assume complete responsibility for the accuracy and completeness of dimensions and for all co-ordination.
- .2 Verify that work is executed in accordance with dimensions indicated, that levels and clearances are maintained, and that work installed in error is rectified before construction continues.
- .3 Check and verify all dimensions including interfacing of services. Dimensions, when pertaining to the work of other trades, shall be verified with the trade concerned. Ensure that all Subcontractors co-operate for the proper performance of the work.
- .4 Do not scale directly from the drawings; this applies all drawings, whether in paper or digital format. If there is ambiguity or lack of information, immediately inform the Consultant. Any change caused by lack of such review shall be the responsibility of the trade concerned.
- .5 Project drawings are based on existing drawings provided by the Owner, the accuracy of which have not been confirmed. Confirm existing conditions on site and take all measurements necessary to fabricate and install new windows, curtain wall components, and perform other Work of this Contract. Coordinate with Owner for any destructive site investigations required.

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 **CUTTING AND PATCHING**

- .1 Before cutting, drilling or sleeving load-bearing elements, obtain approval of location and method.
- .2 Cut and drill with true smooth edge to minimum suitable tolerances.
- .3 Fit construction tightly to stop air movement completely. The trade performing work that penetrates a fire, air, vapour, moisture, thermal or acoustic separation element of the building shall pack voids tightly with insulation, rated where required; seal air, vapour and moisture barriers; and caulk joints as may be required to ensure that no air movement through the penetration is possible.
- .4 Cutting, drilling and sleeving of work shall be done only by specialized trades. The trade requiring drilling and sleeving shall inform the trade performing the work of the location and other requirements for drilling and sleeving. The Contractor shall directly supervise performance of cutting and patching.
- .5 Replace and/or make good damaged work.
- .6 Patching or replacement of damaged work shall be done by the subcontractor under whose work it was originally executed, and at the expense of the subcontractor who caused the damage.

1.2 **EXISTING CEILINGS**

- .1 All existing ceiling components and ceiling mounted fixtures and equipment shall be carefully removed as required to accommodate new work and reinstalled when work is complete.
- .2 Where ceiling tiles are broken in the course of the work, replace with new to match existing. Use fire guard panels in areas where there is no sprinkler system.

1.3 ELECTRICAL WORK

- .1 Electrical work is required for new power window operators and motorized blinds. Remove and replace ceiling tiles, as specified above to bring power from electrical room to locations required.
- .2 Electrical wiring shall include conduit in ceiling spaces and raceways for services surface mounted on walls. Install all raceways straight, level, and parallel to building lines. Paint in colours to match existing wall areas.
- .3 Refer to drawings for scope of electrical work.

SECTION 01 74 00 - CLEANING AND WASTE MANAGEMENT

PART 1 - GENERAL

1.1 GENERAL

- .1 Conduct cleaning and disposal operations to comply with local ordinances, anti-pollution laws, and recommendations of Construction Safety Association.
- .2 Store volatile wastes in covered metal containers, and remove from premises daily.
- .3 Prevent accumulation of wastes which create hazardous conditions.
- .4 Provide adequate ventilation during use of volatile or noxious substances.
- .5 Provide instructions designating proper methods and materials to be used in final cleaning of Work.
- .6 Do not bury or burn any rubble, waste or packaging, or surplus materials. No dumping of waste, such as oil or paint, into sewers will be permitted.
- .7 Dispose of waste materials in accordance with the Environmental Protection Act, R.S.O. 1990, C. E.19, and regulations under the Act, including:
 - .1 O.Reg. 102/94 Waste Audits and Waste Reduction Work Plans
 - .2 O.Reg. 103/94 Industrial, Commercial and Institutional Source Separation Programs
 - .3 R.R.O. 1990, Reg. 347: General Waste Management

1.2 **MATERIALS**

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

1.3 **POLLUTION CONTROL**

- .1 Cover dry materials and rubbish to prevent blowing dust and debris.
- .2 Remove mud deposited on public roads.
- .3 Prevent dust nuisance to adjacent properties, existing school, and general public by taking appropriate pollution control measures as directed by Consultant.

1.4 **DISPOSAL OF WASTES**

- .1 Disposal of waste or volatile materials, such as mineral spirits oil or paint thinner into storm or sanitary sewers prohibited.
- .2 Meet Ministry of the Environment Standards and Guidelines.

1.5 **FIRES**

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

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 74 00 - CLEANING AND WASTE MANAGEMENT

1.6 CLEANING DURING CONSTRUCTION

- .1 Maintain entire site and adjoining municipal and/or private property free from accumulations of waste materials and rubbish. Do not allow rubbish to accumulate in work under construction or on roofs. Clean site daily.
- .2 Maintain work areas free from accumulations of snow and ice.
- .3 Provide on-site containers for collection of waste materials, and rubbish. Empty containers on a regular basis in conformance with Municipal and Provincial Regulations.
- .4 Cleaning operations shall include those areas used for temporary site access or used on a temporary basis to facilitate the Work.
- .5 Broom clean and vacuum areas as required for application of finishes. Continue to clean on an "as needed" basis and insure that areas which receive paint and other finishes are kept dry, dust free, and at acceptable temperatures.
- .6 Keep all areas of the Work clean and orderly, free from accumulation of dirt, debris, garbage, oily rags, excess material, or such other trash items. Remove such items from all areas of the Work on a daily basis.
- .7 Vacuum and/or broom interior building areas when ready to receive painting and other finishes. Continue cleaning on an "as needed" basis until the building is ready for inspection and takeover.
- .8 Schedule cleaning operations so that resulting dust and other contaminants do not affect wet, newly painted surfaces, or newly installed equipment, or devices.

1.7 CLEANING AT COMPLETION OF WORK

- .1 Employ a professional cleaning company to thoroughly clean all areas immediately prior to occupancy of the Work by the Owner. Cleaning company shall be an established firm, bonded and fully insured, and acceptable to the Owner.
- .2 Provide manufacturer's printed cleaning and maintenance instructions to cleaning company. All surfaces are to be cleaned in accordance with the product manufacturer's recommendations.
- .3 Use cleaning products which are non-toxic, environmentally friendly products, and which will not leave residues or odours on surfaces.
- .4 Do not apply sealers, wax, or polish to any flooring without the expressed permission of the Owner. All such products, and the methods of application, must be approved in advance by the Owner.
- .5 Remove all temporary protective coverings provided during construction.
- .6 Remove all protective film. Remove miscellaneous labels from hardware, etc.

SECTION 01 74 00 - CLEANING AND WASTE MANAGEMENT

- .7 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from all exposed interior and exterior finishes, including glass and frames. Clean glass both sides. Remove paint spots and smears from all surfaces, including hardware.
- .8 Clean hardware, aluminum, stainless steel, and other metal surfaces.
- .9 Clean lighting reflectors, lenses and other lighting surfaces.
- .10 Vacuum clean all existing building interiors affected by construction operations.
- .11 Remove debris and surplus materials from the roof areas and accessible concealed spaces.
- .12 Broom clean all asphalt and concrete paved surfaces and rake clean other disturbed surfaces in the area of the Work, to remove site debris caused by the Work of this Contract. Inspect for damages and make good.
- .13 Ensure that all clean up operations specified in other sections has been performed.
- .14 Conduct final inspection of interior and exterior surfaces, and concealed spaces.
- .15 Leave premises ready for immediate occupation without further cleaning, all to the Consultant's approval.

1.8 **REPAIR WORK**

- .1 Repaint or touch up paint finish affected by the Work as necessary to return to new condition.
- .2 Replace all broken glass.
- .3 Repair any damage incurred during cleaning operations.

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 **TAKEOVER PROCEDURE**

.1 Subject to detailed instructions included in these specifications, conform to Recommended Procedures Concerning Substantial Performance of Construction Contracts and Completion Take-over of Projects, OAA/OGCA Document No. 100-2018.

1.2 ACTION REQUIRED AT OCCUPANCY

.1 When partial occupancy of uncompleted project is required by the Owner, co-ordinate the Owner's uses, requirements and access with the construction requirements to complete project. Submit a revised construction schedule, taking restrictions on work activities and hours into account; refer to Section 01 10 00 for special requirements in occupied buildings.

1.3 ACTION REQUIRED AT SUBSTANTIAL PERFORMANCE

- .1 Perform the actions listed below prior to issue of the Certificate of Substantial Performance of the Contract.
- .2 Submit the documents and material detailed in section 01 78 00, Closeout Submittals. Deliver all required submittals to the Consultant for approval PRIOR to Substantial Performance of the Work. Final payment will not be made until all these items have been received and approved.
- .3 Prior to applying for a Certificate of Substantial Performance, perform an inspection in accordance with OAA/OGCA Document No. 100-2018, Stage 2, Contractor's Inspection for Substantial Performance. Submit a copy of the deficiency list to the Consultant.
- .4 When of the opinion that the requirements for Substantial Performance have been met, submit an application for a Certificate of Substantial Performance to the Consultant. The application shall be as outline for Stage 3 of the OAA/OGCA Take-Over Procedures.
- .5 Expedite and complete deficiencies and defects identified by the Consultant. Final Certificate for Payment will not be issued until all deficiencies are satisfactorily corrected, inspected, and approved by the Consultant, and all documentation has been handed to the Consultant.
- .6 Remove all protection erected, and make good all damage to the Work and adjoining Work due to the lack or failure of such protection. In addition, all debris, surplus materials tools equipment shall be removed from the work areas and the site, and the Project shall be left clean and tidy to the full and complete satisfaction of the Consultant and Owner.
- .7 Perform final adjustment of Cash Allowance, specified in Section 01 10 00, General Instructions.
- .8 At time of Substantial Performance, instruct the Owner's personnel in operation, adjustment and maintenance of equipment and systems, using operation and maintenance manuals as the basis for instruction.
- .9 Once the Certificate of Substantial Performance of the Work is issued, the Contractor shall promptly arrange to have the certificate published in the Daily Commercial News.

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 77 00 - CLOSEOUT PROCEDURES

- .10 Prior to final site review, start up and demonstrate operation of all systems to the Owner and the Consultant.
- .11 Review cash and contingency allowances in relation to contract price, change orders, hold-backs and other contract price adjustments.
- .12 Review inspection and testing reports to verify conformance to the intent of the documents.
- .13 Review condition of all equipment, which has been used in the course of the Work to ensure turnover at completion in "as new condition" with warranties, dated and certified from time of Substantial Performance of the Contract.
- .14 Provide on-going review, inspection, and attendance to building call back, maintenance and repair problems during the warranty periods.
- .15 Continue to submit monthly deficiency status reports, as specified in Section 01 32 00, Construction Progress Documentation.

1.4 **TOTAL PERFORMANCE**

- .1 Upon completion of all items noted on the deficiency list, clean all areas, surfaces, and components affected by corrections and completion of deficient items.
- .2 Ensure that all services, equipment, and apparatus are properly tested and adjusted.
- .3 Letter of Completion:
 - .1 Submit a Letter of Completion to the Consultant stating that the Contract is complete, that all deficiencies identified by the Consultant, Inspectors and Owner have been rectified, and requesting final review by the Consultant.
 - .2 Sign and return deficiency lists, issued by the Consultant, to confirm completion of all deficiencies identified thereon.
- .4 Final Site Review:
 - .1 Consultant will conduct one site review for Total Performance, within ten (10) working days of the request by the Contractor. Should the Contractor fail to provide the Letter of Completion, the Consultants will be under no obligation to perform a site review within the above noted time.
 - .2 Additional site reviews, as requested by the Contractor or as necessitated due to the Contractor's failure to complete work as required, shall be paid for by the Contractor at a rate of \$500 per visit, plus the cost to prepare additional site review reports at per diem rates (rates as recommended by the OAA, or as negotiated in advance).
- .5 Submit a final request for payment, incorporating all approved changes to the Contract price, and adjustments to the Cash Allowance.

SECTION 01 77 00 - CLOSEOUT PROCEDURES

.6 Final Certificate for Payment will not be authorized until all deficiencies are satisfactorily corrected, reviewed and signed off by the Consultant, and required submittals have been completely and accurately provided.

1.5 WARRANTY PERIOD

.1 The Warranty Period on this Project will expire **twelve (12) months** from the date of Substantial Performance of the Work, except for extended warranties as called for throughout the Specifications or equipment not certified by Consultant at time of Substantial Performance.

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTALS REQUIRED AT SUBSTANTIAL PERFORMANCE

- .1 Prior to Substantial Performance of the Contract, perform the actions detailed in section 01 77 00, Closeout Procedures, and submit the following documents and materials:
 - .1 Deficiency list prepared by Contractor for both interior and exterior areas of the project.
 - .2 Certificates of good standing from the Workplace Safety & Insurance Board for the Contractor and all Subcontractors
 - .3 Operations and Maintenance Manuals, including warranties. If manuals are unavailable, the designated value of the submittals will be retained in the Contract; see below.
 - .4 One complete set of final approved Shop Drawings indicating corrections and changes made during fabrication and installation
 - .5 Keys and construction cores
 - .6 Maintenance materials
 - .7 As-Built Documents as specified in Section 01 33 00, Submittal Procedures
 - .8 Inspection Certificates required by Provincial, Municipal and other authorities having jurisdiction.
- .2 Deliver all required submittals to the Consultant for approval prior to Substantial Performance of the Work. Final payment will not be made until all these items have been received and approved. These submittals include:

1.2 MAINTENANCE MANUALS

- .1 At Substantial Performance, submit to Consultant one hard copy and one digital copy of an Operations Data and Maintenance Manuals made up as follows:
 - .1 Bind data in vinyl hard covered, three-ring loose leaf binders for 212.5mm x 275mm (8-1/2" x 11") size paper. Digital copy shall be submitted in pdf (portable document format) on a single USB flash drive with label or tag identifying project.
 - .2 Enclose title sheet, labelled "Operation Data and Maintenance Manual", project name, date and list of contents. Include the following information:
 - .1 name of project
 - .2 name of Owner
 - .3 name of Consultant
 - .4 name of Contractor
 - .5 date of Substantial Performance.

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

- .3 Organize contents into applicable sections of work to parallel project specification break-down. Mark each section by labelled tabs protected with celluloid covers fastened to hard paper dividing sheets
- .4 All data related to a section of work or product shall be grouped together, except for shop drawings, unless otherwise requested by the Owner. Confirm method of organization with Owner prior to assembling manuals. Typically, each section shall be organized, as applicable, as follows:
 - .1 General information; identify section of work, subcontractor(s) responsible
 - .2 Warranty
 - .3 Guarantees, Bonds
 - .4 Schedules (hardware, paint)
 - .5 Product data sheets
 - .6 Material safety data sheets (MSDS)
 - .7 Operating manual
 - .8 Maintenance instructions
 - .9 Receipts for maintenance materials, keys, etc.,
 - .10 Maintenance contracts (applicable to elevator, wheelchair lift, planting, sod, etc.)
 - .11 Inspection and testing reports
 - .12 Shop Drawings
- .2 Provide one copy of each of the following in the first binder:
 - .1 Contractor's final statutory declaration on CCDC form 9A-2001
 - .2 Major Subcontractor's final statutory declarations on CCDC form 9B-2001
 - .3 Workers' Compensation and Insurance Board (WSIB) certificate
 - .4 certificates of approval of the work by the Building Department (if available)
- .3 Also in the binder, provide a disk or memory stick containing all construction progress photos submitted; refer to Section 01 32 00. Provide an index with printed images clearly identified with name of project, description of view and date taken. Disks are to be clearly labelled .
- .4 Include the following information, plus any additional data required within the specifications.
 - .1 List of all Subcontractors, major suppliers, and local equipment service representatives, their addresses and telephone numbers.
 - .2 Date of Substantial Performance (commencement of warranty periods) and termination dates of warranties.
 - .3 Door and Frame Schedule (as-built); insert in front of Division 08 section in manuals.
 - .4 Final hardware schedule, revised to include all changes during construction, including local manufacturer's descriptive and service literature. Include AHC's final inspection report.
 - .5 Provide paint schedule indicating paint brand and formulas used.
 - .6 Maintenance instructions for all types of special finishes. Include instructions for cleaning, repairing, refinishing and freshening, and warnings of damaging or dangerous practices where necessary.

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

- .7 Maintenance and service instructions and manufacturer's literature for all special architectural features: i.e. windows, patent glazing, handicapped lift etc.
- .8 Description, operations and maintenance instructions for equipment and systems, including complete list of equipment and parts list.
- .9 All warranties, guarantees, bonds, etc., properly completed and signed, which extend beyond the general warranty period, for all work and equipment as specified or as otherwise supplied and installed, from manufacturers and trades. Warranties, guarantees and bonds shall include:
 - .1 Name and address of project.
 - .2 Warranty commencement date.
 - .3 Duration of warranty.
 - .4 Clear indication of what is being warranted and what remedial action will be taken under warranties.
 - .5 Signature and seal of Contractor.
- .5 List additional material used in project showing name of manufacturer and source of supply.
- .6 Neatly type lists and notes. Use clear drawings, diagrams or manufacturer's literature.
- .7 Supply copies of inspection and testing reports, inspection and acceptance certificates, balancing reports, all bound in all three copies of manuals.
- .8 Supply Operations and Maintenance manuals, and other required documentation as specified for Mechanical and Electrical work.
- .9 Manuals must bear seal and signature of Contractor.
- .10 Maintenance Manuals must be delivered, complete and in one package, to Consultant. The final Certificate for payment will not be issued until ALL documentation has been received, reviewed, and approved, by Consultant.
- .11 Provide a complete set of final approved Shop Drawings. Shop drawings shall be the drawings reviewed and stamped by the consultants. Mark-up shop drawings to indicate corrections and changes made during fabrication and installation.
- .12 Provide a digital copy of the shop drawing manual, included on the USB flash drive with the digital copy of the maintenance manuals.
- .13 Disks and USB flash drives must be clearly and permanently labelled.

1.3 MAINTENANCE MATERIALS

- .1 Where supply of maintenance materials is specified, deliver items as follows:
 - .1 Materials in unbroken cartons or, if not supplied in cartons, they shall be strongly packaged.
 - .2 Clearly mark as to content.

SECTION 01 78 00 - CLOSEOUT SUBMITTALS

- .3 If applicable give colour, room number of area where material used.
- .4 Obtain signed receipt from the Owner's designated representative and store in an assigned, lockable room.
- .2 Copies of signed receipts for maintenance materials are to be included in the maintenance manuals.
- .3 Replacement materials are for the sole use of the Owner and must not be used by Contractor to replace deficient work.

1.4 **AS-BUILT DRAWINGS**

- .1 Provide As-Built Drawings, as specified in Section 01 33 00, and Record Documents (electronic files).
- .2 Prior to the date of Substantial Performance, request updated drawings from the Consultant. Transfer all "as-built" markups from the on-site drawings to these updated drawings and return them to the Consultant for preparation of architectural Record Drawings.

1.5 **REVIEW OF MANUALS BY CONSULTANT**

- .1 Submit all manuals for review by the Consultant.
- .2 The Contractor is responsible for confirming the completion of the manuals prior to forwarding to the Consultant for review. If any items are outstanding, provide tabs at the appropriate locations and indicate the nature of the outstanding documents to be inserted.
- .3 Do not submit partially complete manuals to the Consultant; only documents which cannot be provided at the time of Substantial Performance are permitted to be flagged for later insertion. The Consultant will review manuals once for completion and will then review only one resubmission. If additional reviews are required, the Contractor will be invoiced for the Consultant's time at a rate of \$125/hour.

1.6 VALUATION OF CLOSEOUT SUBMITTALS

- .1 Due to the high value to the Owner of the closeout submittals, for the purpose of project administration and calculation of Substantial Performance, the Closeout Submittals will be assigned a value of \$5,000.00.
- .2 The full assigned value of the submittals for each discipline will be held in the Contract until such time as all closeout submittals required for that discipline are delivered to the Consultant and are deemed complete and acceptable by the Consultant.
- .3 Architectural record drawings, to be prepared by the Consultant and paid through the Cash Allowance, are not included in the valuation of closeout submittals.

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 Demolition and removal of existing aluminum windows to be replaced, as indicated on drawings, including modifications required to facilitate installation of new windows. Selective demolition for curtain walls is included in Section 08 44 13.
- .2 Removal of existing window blinds.
- .3 Carry out all demolition, cutting and removal of existing work in preparation for the installation of the new windows. Remove sealants, foam and adhesives from masonry.
- .4 Carry out all alteration and demolition work required to accommodate new work indicated on drawings. Make good any damage caused by alterations required.
- .5 Repair or replace existing surfaces damaged by the work of this Contract. Finished surfaces to be ready for repainting.
- .6 Unless noted otherwise, building materials resulting from demolition under this contract shall become the property of the Contractor, and shall be removed by the Contractor.
- .7 Remove, transport, and dispose of hazardous materials in accordance with applicable laws.
- .8 Supply and install temporary dust controls in work areas, to prevent the spread of dust, dirt and debris in the building.
- .9 Include costs to schedule work outside of school operating times, as applicable, including afterhours and weekend work and remobilization costs. Work will be limited to 2 or 3 classrooms only at times when school is occupied.
- .10 Engage a licenced electrician to perform electrical work.

1.2 **RELATED WORK**

.1	Hazardous Materials	Section 01 35 43
.2	Temporary Barriers and Controls	Section 01 56 00
.3	Execution	Section 01 73 00
.4	Repair and Restoration of Unit Masonry	Section 04 01 00
.5	Glazed Aluminum Curtain Walls	Section 08 44 13
.6	Aluminum Windows	Section 08 51 13
.7	Gypsum Board	Section 09 29 00
.8	Repainting	Section 09 92 00

1.3 **REFERENCES**

.1 Conform to all laws, By-Laws and regulations of the authorities having jurisdiction and, in particular, the Ontario Occupational Health and Safety Act; The Environmental Protection Act; The Ontario Building Code, (Ontario Reg. 332/12); The Ontario Fire Code; The National Building Code; and the National Fire Code. Refer to current editions of all standards.
DIVISION 02 - EXISTING CONDITIONS

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

- .2 CSA S350-M, code of practice for safety in demolition of structures.
- .3 Environmental Protection Act, R.S.O. 1990, C. E.19, and regulations under the Act, including: .1 O.Reg. 102/94 Waste Audits and Waste Reduction Work Plans
 - .2 O. Reg. 103/94: Industrial, Commercial And Institutional Source Separation Programs
 - .3 R.R.O. 1990, Reg. 347: General Waste Management
- .4 Occupational Health and Safety Act, and regulations under the Act, including:
 - .1 O.Reg. 213/91 Construction Projects
 - .2 O.Reg. 278/05, Designated Substance Asbestos on Construction Projects and in Buildings and Repair Operations
 - .3 O.Reg. 860/90 Workplace Hazardous Materials Information System (WHMIS)
 - .4 All regulations regarding "Designated Substances"
- .5 Regulations for the transport of asbestos waste, including:
 - .1 Transportation of Dangerous Goods Act, 1992 (1992, c. 34)
 - .2 Dangerous Goods Transportation Act, R.S.O. 1990, c. D.1

1.4 **EXAMINATION OF EXISTING SITE AND STRUCTURE**

- .1 Examine the existing site and building before tendering to be familiar with the detailed extent of demolition, dismantling, relocation and reassembly required.
- .2 Copies of available original working drawings for the construction of parts of the building are being made available in digital format only, as supplementary information.
- .3 An inventory of hazardous materials has been conducted for the existing building; a copy of which will be made available by the Owner. Refer also to Section 01 35 43.

1.5 **PROTECTION**

- .1 Erect fencing, interior barriers, notice and warning boards and maintain all protection of all kinds for the protection of the workers on the work, for the protection of adjoining property and for protection of public.
- .2 Protect all existing paving and site amenities not designated for removal. Make good damage to the approval of the Consultant.
- .3 Prevent movement, settlement, and damage to existing building to remain, services, paving, landscaped areas to remain, and adjacent structures. Provide temporary supports, including shoring and bracing, as required. All shoring must be designed by a professional engineer licenced in the Province of Ontario.
- .4 Protect adjacent properties against damage which might occur from falling debris or other cause. Make good damage to adjacent public or private properties resulting from Work of this Contract.
- .5 Protect existing building from damage and contamination during demolition activities. All openings must be made weatherproof. Provide temporary barriers, dust control measures, security controls, supports, and such additional protection as may be required by specific demolition work.

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

- .6 Remove contaminated and dangerous material from the site and dispose of safely and legally. Meet all M.O.E. requirements.
- .7 Take precaution against contamination of air and adjacent properties.

1.6 MAINTAINING FIRE SAFETY IN EXISTING BUILDING

- .1 Maintain all required exiting for safe operations within the existing building. Where an exit is closed off due to construction activities, provide alternate exit acceptable to both the Consultant and to Authorities Having Jurisdiction. If access to exit must be through an area under construction, provide smoke tight enclosure with minimum 45minute fire resistance rating. Any temporary exits must be clearly identified with appropriate signage.
- .2 Maintain access roadways for fire department vehicles, acceptable to the fire department. Access must be approved prior to commencement of construction activities.
- .3 Store all combustible materials in accordance with the Fire Code and the Occupational Health and Safety Act. Do not store combustible materials within the existing building or against the building. All combustibles shall be stored in a manner which minimizes risks to building and occupants.
- .4 Maintain fire alarm system in operating condition in existing building. Notify the fire department and school principal of any temporary shutdowns of service and provide alternative measures during such periods of time.
- .5 Coordinate with Owner and Authorities Having Jurisdiction for all changes to fire emergency procedures as may be required during construction.

1.7 SCHEDULE OF WORK

- .1 Student safety and required exiting from the existing school must be maintained al all times, particularly during the school's operating hours and scheduled events. Work must be suspended if the Principal advises that noise and/or dust is interfering with the school program.
- .2 Construction fencing must be installed and construction area secured before any work is undertaken. Enclosures must conform to Ministry of Labour and Municipal requirements.
- .3 Dust proofing measures must be installed prior to any work being undertaken.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Air and Vapour Retarders
 - .1 Vapour retarder membrane:
 - .1 Perm-A-Barrier by Grace, Blueskin SA by Henry Co., ExoAir 110 by Tremco, Air Shield by W.R. Meadows, AquaBarrier AVB by IKO, AirTight 40 by Blok-Lok, or Sopraseal Stick 1100T by Soprema Canada

DIVISION 02 - EXISTING CONDITIONS

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

- .2 Vapour permeable air barrier:
 - .1 Perm-A-Barrier VPS by Grace, Blueskin VP160 by Henry, Air Shield SMP by W.R. Meadows, Sopraseal Stick VP by Soprema Canada, or Delta-Vent SA by Dörken Systems Inc.
- .3 Through-wall flashing:
 - .1 Perm-A-Barrier Wall Flashing by Grace, Blueskin TWF by Henry Co., ExoAir TWF by Tremco, Air Shield TWF by W.R. Meadows, AquaBarrier TWF by IKO, AirTight 40 by Blok-Lok, or Sopraseal WFM by Soprema.
- .4 Primer for vapour retarder:
 - .1 Perm-A-Barrier WB Primer by Grace, Blueskin Primer by Henry, ExoAir 10 Primer by Tremco, Mel-Prime by W. R. Meadows, S.A.M. Adhesive by IKO, or Elastocol Stick by Soprema.
- .5 When ambient or surface temperatures are below 5°C, use low temperature versions of these products.
- .2 Cavity Wall Insulation:
 - .1 Stone mineral wool fibre insulation board, semi-rigid, conforming to CAN/ULC S702, RSI value of 0.76m²K/W per 25.4mm (R-4.3/inch), with a flame spread rating of 0, smoke developed rating of 0, manufactured and sized to suit metric masonry coursing;
 - .2 Insulation shall be CavityRock by Rockwool International, Thermafiber Rainbarrier 45 by Owens Corning, or Cladstone by Johns Manville
 - .3 Cavity wall insulation to be 102mm thick, R-17.2, unless otherwise indicated on drawings or required by site conditions.
- .3 Batt Insulation: Rockwool International "Comfort Batt", Johns Manville "TempControl", or Owens Corning "Thermafiber UltraBatt", friction fit stone wool batts.
- .4 Other materials shall conform to the specifications of related Sections.

PART 3 - EXECUTION

3.1 **DEMOLITION**

- .1 Refer to drawings for demolition plans and notes.
- .2 Reference to windows below shall be interpreted as including all aluminum windows complete with glazing, hardware and accessories, all as indicated to be replaced with new under this Contract.
- .3 Remove all existing windows indicated to be replaced with new. Removals shall be coordinated with installation of new windows in each opening.
- .4 Remove all joint sealants and related materials at perimeter of windows and doors being removed. Clean openings and leave ready for installation of new windows and doors and joint sealants.

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

- .5 Remove insulation and loose vapour retarders and through-wall flashings where metal panels are removed with windows. Clean area and prepare to receive new vapour retarder, through-wall-flashing and insulation, and new windows with aluminum panel inserts.
- .6 Any items noted to be re-used or re-located are to be removed carefully, packaged appropriately, clearly labelled, and handed over to Contractor.
- .7 Upon discovery of mould or mouldy materials remove and dispose of these separately.
- .8 If any additional materials suspected to contain asbestos and other designated substances are encountered, do not disturb these materials. Inform the Consultant of the location and extent of suspect material. Do not resume work in this area until it has been cleared by an Abatement Consultant.
- .9 At the end of each day's work, leave work in a safe condition so that no part of the remaining structure is in danger of collapse.
- .10 Do not burn any refuse or debris at the site.

3.2 WINDOW BLINDS

- .1 Remove all window blinds at windows to be replaced and at curtain walls, including all mounting hardware and accessories. Dispose of all blinds not indicated or noted to remain or be re-used.
- .2 Remove all remaining track and hangers remaining from window coverings, which have previously been removed.
- .3 Where window blinds are indicated to be reused, remove blinds carefully, complete with all hardware and accessories, wrap in protective packaging, label as to specific contents and location, and store for later reinstallation.

3.3 **REPAIRS TO EXISTING INTERIOR WALLS AND FINISHES**

- .1 Repair damage to existing interior walls where finishes are removed to accommodate window replacement.
- .2 Masonry:
 - .1 Repair existing damage to interior wythe of masonry at window sills, jambs and heads with patching compounds and fillers.
 - .2 Remove peeling and flaking paint prior to installation of new windows.
 - .3 Leave masonry surrounding windows in good condition, ready for repainting.
 - .4 Repairs to exterior masonry are specified in Section 04 01 00.

DIVISION 02 - EXISTING CONDITIONS

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

- .3 Gypsum Board:
 - .1 Remove gypsum board, steel framing, vapour barrier and insulation in walls as required to facilitate removal of existing windows and doors and installation of new windows and doors, and where indicated on drawings.
 - .2 Remove existing water-damaged gypsum board above windows where indicated on drawings, for replacement with new drywall finish.
 - .3 Remove gypsum board and non-structural framing above second storey windows at sloped roof areas, to extent indicated on drawings. These areas are to be rebuilt to increase insulation and water resistance, as specified below.
 - .4 Cut out and replace any sections of gypsum board and framing damaged by the work of this Contract.
 - .5 Replace insulation and vapour barrier where damaged by this work.
 - .6 Refer to section 09 29 00 for gypsum board and sheathing work.
- .4 All repairs to be completed to level required for finish painting.

3.4 **REMOVAL OF CEILINGS**

- .1 Remove sections of existing ceilings and bulkheads in areas where they interfere with the demolition or installation work.
- .2 Where acoustic tile ceilings are to be removed to accommodate work, and later reinstalled, carefully disassemble ceilings to the extent required. Clean all components, wrap for protection, clearly label package contents, and store in a safe location until they are to be reinstalled. If any ceiling tile is damaged during the work, replace with new fire-rated panels to match the appearance of the existing panels.
- .3 Repair damage to gypsum board ceilings and bulkheads to remain, as specified above, to level required for finish painting.

3.5 **REMOVAL AND REINSTALLATION OF METAL SOFFITS**

- .1 Carefully remove prefinished metal soffits where second storey windows are to be replaced below sloped roof areas. Retain metal panels for later reinstallation. Wrap panels in protective coverings, clearly label as to contents and panel locations, and store in secure location.
- .2 After completion of window installation and other adjacent work, reinstall metal soffit. Site measure soffit space, which will be modified, and cut panels to new sizes as required. Provide new prefinished metal edge trim and fasteners. New trim shall match colour of existing soffit panels.

3.6 ALTERATIONS TO EXTERIOR WALL BELOW SLOPED ROOF

.1 After removal of metal soffits, remove part of exterior wall assembly above windows and rebuild in accordance with drawing details. Coordinate with window work.

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

.2 Build out the wall around the existing beam, as detailed, with new steel stud framing, stone wool insulation, and exterior sheathing. Apply self adhering vapour permeable air barrier over sheathing. Steel studs and sheathing to be as specified in Section 09 29 00.

3.7 SHEET METAL CAP FLASHING

- .1 Carefully remove prefinished metal cap flashing at curtain wall locations, where it overlaps top of curtain wall framing. Clean and store for later reinstallation.
- .2 Provide temporary protection for top of wall while cap flashing is removed.
- .3 Apply new membrane flashing over top of roof curb; IKO Modiflex 180 cap sheet using Cold Gold adhesive, or equivalent acceptable to the Consultant.
- .4 Provide new formed corner sections of cap flashing, as required to rejoin sections of cap flashing at each end of curtain wall sections, where sheet metal is cut for removal. Colour to match existing, which appears to be stone grey or similar. Provide colour samples to Consultant, on site, for confirmation of colour match.
- .5 If cap flashing is damaged during the work, replace with new to match colour and profile of existing.

3.8 SECURITY SCREENS

- .1 Remove existing security screens on north side of building (total 4), complete with all fasteners. These are referenced on the floor plans to note number 13. Discard fasteners.
- .2 Clean screens of rust and surface contamination such as dirt, oil, loose paint, and other foreign matter. Wash with abrasive cleanser, or, wash thoroughly and dull by sanding, and prepare for repainting in accordance with Section 09 92 00. Repaint screens, both sides, in accordance with repainting specifications; use full coat of bonding primer below finish coats. Finish shall be semi-gloss in silver-grey colour. Wrap refurbished screens in protective coverings, label clearly as to contents and locations, and store for later reinstallation.
- .3 Repair brick where screens are removed.
- .4 Reinstall security screens after completion of window work in that location. Provide new stainless steel fasteners; minimum 12 per screen.

3.9 ELECTRICAL WORK

- .1 Engage a licenced electrician to do all removals, relocations, and reinstallations of electrical fixtures, security fixtures and fittings, wiring, and accessories as identified on drawings and as specified.
- .2 Refer to drawings for extent of new electrical work. Obtain all permits required for electrical work. Permit fees are to be paid by the Contractor for reimbursement through the Cash Allowance included in the Contract.

DIVISION 02 - EXISTING CONDITIONS

SECTION 02 40 00 - DEMOLITION AND ALTERATIONS

- .3 Provide all electrical service, conduit, and raceways required for power window operators and motorized window blinds, and as noted on drawings. Coordinate with trades installing those products.
- .4 Install Wiremold V700 series raceways in straight lines, in a neat manner, to locations of blinds, window hardware and keyed wall switches. Paint to match existing wall surfaces.

3.10 COMPLETION OF WORK

- .1 Remove all surplus materials, equipment and rubbish from the site.
- .2 Leave site in condition to meet approval of the Consultant.
- .3 On completion of Demolition work, thoroughly clean all existing surfaces to remain, including ceiling space. No debris or dirt shall remain to be enclosed by new construction.

END OF SECTION

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 **Masonry Repairs**
 - Replacement of broken and spalled masonry units at window sills, jambs, and heads, .1 including staining to match existing brick.
 - .2 Repointing of brick in existing masonry sills.
 - .3 Masonry work as indicated on drawings.
- .2 It is anticipated that more loose, deteriorated, and broken brick will be discovered in the course of the Work of this Contract. Such conditions, when identified, will be evaluated by the Consultant and may be added to the scope of Work by Change Order, and paid through the Contingency Allowance included in the Contract.

1.2 **RELATED WORK SPECIFIED ELSEWHERE**

.1	Demolition and Alterations	Section 20 40 00
.2	Glazed Aluminum Curtain Walls	Section 08 44 13

.3 Aluminum Windows Section 08 51 13

1.3 REFERENCES

.1	CSA	Group:	

.1	CSA A82	Fired Masonry Brick Made From Clay or Shale
.2	CAN/CSA A179	Mortar and Grout for Unit Masonry

CAN/CSA A179 Mortar and Grout for Unit Masonry

- .3 CSA A370 Connectors for Masonry.
- .4 CAN/CSA A371 Masonry Construction for Buildings .5
 - CSA A3000 **Cementitious Materials Compendium**

.2	ASTI	M International:	
	.1	ASTM C270	Standard Specification for Mortar for Unit Masonry
	.2	ASTM C207	Standard Specification for Hydrated Lime for Masonry Purposes

.3 Brick Industry Association

ASTM International

	,	
.1	BIA Technical Note 8B	Mortars for Brickwork - Selection and Quality Assurance
.2	BIA Technical Note 18A	Accommodating Expansion of Brickwork
-		

.3 **BIA Technical Note 20** Cleaning Brickwork .4 **BIA Technical Note 46**

Maintenance of Brick Masonry

- Meridian Brick: .4 Weatherproofing Masonry for Northern Climates
 - National Research Council (NRC) .1 Construction Technology Update No. 67 Repointing Mortars for Older Masonry **Buildings - Design Considerations** .2 Construction Technology Update No. 68 Repointing Mortars for Older Masonry **Buildings - Site Considerations**

.5

DIVISION 04 - MASONRY

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

1.4 **QUALITY ASSURANCE**

- .1 Subcontractor shall be a company specializing in commercial masonry work and masonry restoration, with minimum five (5) years documented experience in masonry restoration projects.
- .2 Masonry restoration work shall be executed under the continuous supervision and direction of a competent foreman familiar and experienced with the materials and methods specified and with the design requirements for masonry restoration.
- .3 Perform masonry work to CSA-A371.

1.5 SUBMITTALS

- .1 Submit product data sheets for all materials proposed for use in this project, in accordance with Section 01 33 23.
- .2 Obtain Consultant's final approval of brick samples prior to ordering materials.
- .3 Submit colour samples of colour matched materials, for review by Consultant on site.
- .4 Submit technical data sheet for mortar mixtures. Indicate related standards and mortar properties in terms of compressive strength, water retention and air content. Provide all test certificates required for mortar mixture lots delivered to site.

1.6 STORAGE AND HANDLING

- .1 Ensure that sufficient brick has been ordered to complete project from a single production run.
- .2 Any special shapes must be ordered in time to be manufactured with the main order of brick, to ensure colour consistency.
- .3 Deliver masonry units to site, taking care to prevent damage. Lift skids with appropriate slings or forks, with protection to prevent damage. Protect corners and edges.
- .4 Store masonry units on timbers or platforms, at least 75mm above grade, in such a manner as to prevent damage and staining of units. Cover to protect from weather.
- .5 Deliver materials to site in manufacturer's original unopened containers and packaging, bearing labels as to type and names of products and manufacturers.
- .6 Protect grout, mortar and other materials from deterioration by moisture and temperature. Store in a dry location or in waterproof containers. Comply with manufacturer's recommendations for minimum and maximum temperature requirements for storage.

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Brick:
 - Burned clay brick to CAN/CSA A82.1, Type FBX, Grade SW, as manufactured by .1 Meridian Brick or Brampton Brick.
 - .2 To match sizes and textures of existing brick, and to be of similar colours.
 - .3 Brick to be tinted to match existing where exposed.
- .2 Obtain materials for patching, coating, crack repair, setting, and repointing from a single manufacturer to ensure compatibility and matching in guality, colour, and texture.
- .3 Mortar:
 - fine grain aggregate, graded in accordance with CSA-A179 .1 Sand: .2
 - Water: potable, free of ice and any contaminants, to CSA A179.
 - .3 Portland cement: to CAN/CSA-A5 normal Type 10.
 - .4 Hydrated lime: type 'S', in accordance with ASTM C207
 - As recommended by mortar manufacturer. Colour to match .5 Colouring agent: existing at each site.
- .4 Metal Anchors: Conforming to Ontario Building Code.
- Through Wall Flashing: Refer to Section 07 26 00 .5
- .6 Prefinished Metal Flashing: Refer to Section 07 62 00
- .7 Weep Hole Vents: Blok-Lok "Cell-Vent" ventilator.
- .8 Wall Ties: .1
 - For brick veneer to existing masonry, concrete or brick:
 - .1 BL-5407 Repair and Restoration masonry fastener by Blok-Lok, stainless steel.
 - .2 For masonry to existing masonry:
 - .1 Torg-Lok Mechanical Anchoring System by Blok-Lok; Torg-Lok 510 Series Anchors.

.9 Rust-inhibiting Bonding Agent:

- Ardex BACA Bonding and Anti-Corrosion Agent by Ardex Americas, two component brush .1 or spray applied coating for steel reinforcement.
- .10 Special Shapes: as required to replace broken and damaged existing units, colour and texture on all exposed faces to provide exact match to the face brick.
- .11 Control joints for brick: Sealant and backing rod, with Blok-Lok "Exp-Joint", closed cell neoprene expansion joint material.
- Brick Stain: .12 Staining shall be the products of Nawkaw Corporation, or PermaTint.

2.2 **MORTAR MIX**

.1 All mortars to be cement-lime type.

DIVISION 04 - MASONRY

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

- .2 Repointing mortar shall be Type 'O' mortar. Compressive strength to be minimum 2.4 MPa at 28 days.
 - .1 Repointing Mortar shall be pre-blended, pre-packaged Type O mortar, "MasonCare 300" as manufactured by King Masonry Products, or "Restomix" as manufactured by Daubois. Colourants to be premixed with mortar materials.
 - .2 Colour to match existing mortars at each site.
- .3 Bedding mortar, where required, shall be pre-blended, pre-packaged Type 'N' mortar; "King 1-1-6" by King Masonry Products or "Betomix Plus Type N" by Daubois.
- .4 Compressive strength of mortars must not exceed the compressive strength of the masonry units with which they are being used. Compressive strengths of mortars shall conform to CSA Standard A179.

2.3 **GROUT**

- .1 Grout:
 - .1 Fine grout to CSA A179, with sufficient water to produce pouring consistency without segregation of ingredients, but to retain cohesiveness.
 - .2 Grout shall be pre-blended, pre-packaged, Portland cement based, low compressive strength grout; Cellfiller E-15, as manufactured by King Masonry Products
 - .3 Compressive strength shall not exceed the compressive strength of the masonry units.

PART 3 - EXECUTION

3.1 GENERAL

.1 Review drawings and inspect walls to determine the scope of repair work required. The intention is that all precast lintels at windows are to be repointed and any broken masonry shown on the drawings is to be replaced, as indicated. Additional masonry repairs are likely to be added to the Contract as window replacement work progresses.

3.2 **PREPARATION**

- .1 Where indicated, remove heavily spalled, loose and broken brick, for replacement with new brick. To remove brick, first cut out surrounding mortar, to prevent damage to adjacent brick. Brick to be removed can be broken to facilitate removal.
- .2 Where bricks are removed, carefully remove surrounding mortar back to remaining masonry. Remove all debris and dust by brushing or vacuuming.
- .3 Cut out sections shall be squared off at the edges.
 - .1 Do not overcut corners of the patch; stop short of corner and chip out remainder by hand without damaging surrounding masonry.
 - .2 Do not allow any feathered edges in the patch areas.

MONSIGNOR JOHN PEREYMA C.S.S. WINDOW REPLACEMENT 2021

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

- .4 Once the deteriorated material in an area has been removed, remove rust on any exposed anchors by wire brush.
 - .1 Remove material around steel anchors to provide a minimum of 6mm clearance.
 - .2 Apply approved rust -inhibitive bonding agent to cleaned reinforcement.
- .5 Remove torn, deteriorated, and inelastic sealants.
- .6 Take care not to damage flashing, adjacent masonry, or other surfaces. Repair damage, or replace items, to make good.

3.3 JOINT PREPARATION

- .1 Prepare joints for repointing by raking out joints to a continuous, uniform depth. Depth shall be equal to twice the joint thickness. Ensure mortar remaining is sound.
- .2 Rake out joints by hand chisel or small pneumatic tools. Take care not to damage the edges of the existing masonry.
- .3 If the Contractor proposes to use power tools to rake out joints, the method must be demonstrated on site for the Consultant. The procedure must be shown to be effective and without damage to masonry. Do not proceed until the procedure is accepted by the Consultant.
- .4 After raking, clean joints by brushing or vacuuming, and wash down with water spray to remove dust and debris.

3.4 MIXING OF MORTAR

- .1 Mix mortar ingredients thoroughly in quantities needed for immediate use. Colour of mortar shall match colour of existing mortar.
- .2 Mix mortar in mechanical mixer operated until materials are homogeneously blended, but not less than 3 minutes after all materials are in mixer.
- .3 Hand mixing permitted provided quantities of materials and water are accurately controlled, and that method of mixing is approved by Consultant.
- .4 Mason to review mixing procedures with mortar manufacturer.
- .5 Obtain manufacturer's approval for any additives.
- .6 Comply with the manufacturer's written specifications and recommendations for mixing, application, and curing of grouts and patching materials.
- .7 Pre-hydrate repointing mortar to reduce shrinkage.
 - .1 re-hydrate mortar 1 to 1 ½ hours before it will be used.
 - .2 Mix ingredients with only enough clean water to create a damp mixture, capable of forming a ball.

DIVISION 04 - MASONRY

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

3.5 **REPOINTING**

- .1 Ensure raked out joints are clean, as specified above, prior to commencing repointing work.
- .2 Dampen joints to ensure adequate bonding, and allow masonry to absorb all surface water before proceeding with the work.
- .3 Add just enough water to pre-hydrated mortar to bring to a workable consistency.
- .4 Pack mortar into joints in multiple layers, in depths of no more than 6mm at one time.
- .5 Completely fill joints with mortar. This is a mandatory requirement. If inspection reveals that this requirement has not been met the mortar must be raked out and the joints repointed again, in accordance with this Specification, at no additional cost to the Owner.
- .6 Repointed joints shall be tooled to concave shape.
- .7 Tooling of joints shall consist of compressing mortar as the work proceeds with a non-staining (plastic or stainless steel) tool to produce a dense, perfectly flush or concave joint.

3.6 **REPLACEMENT OF DAMAGED BRICK**

- .1 Ensure voids and areas to receive new brickwork are clean and free of any debris or contaminants that could interfere with bonding.
- .2 To ensure adequate bonding, dampen adjacent masonry surfaces and allow masonry to absorb all surface water before proceeding with the installation of replacement bricks.
- .3 To install single bricks, coat brick, and surfaces in which it will be installed, with mortar. Centre brick in opening and push into place. Remove excess mortar and point around the brick, tooling as described above for repointing.
- .4 Bond: Maintain existing bond patterns, including soldier courses, rowlock bands, etc.
- .5 Provide special shapes at outside corners; 45 degree, cut brick will not be acceptable.
- .6 Where ends of bricks are exposed, as at corners and rowlocks, the end of the brick must match the finished face of the adjacent bricks.
- .7 Where sections of brick are removed, rather than individual bricks, brick shall be tied to structure with specified brick ties.
- .8 Brick ties:
 - .1 Tie location, spacing, and pattern shall conform to CSA-S304.1.
 - .2 Pre-drill for anchors using appropriate type and size of bit. Provide minimum embedment of 25mm.
 - .3 Install brick ties in accordance with manufacturer's instructions.
- .9 Weep Hole Vents: Where bricks are replaced adjacent to existing weeper vents, remove old weeper vents and provide new.

SECTION 04 01 00 - REPAIR AND RESTORATION OF UNIT MASONRY

3.7 STAINING OF NEW BRICK

- .1 As the new brick colour will not match the existing exactly, provide staining of new brick that will be exposed in the wall.
- .2 Stain shall be applied with brush or roller to new areas of brick and individual new bricks.

3.8 **PROTECTION**

- .1 Protect both existing brickwork from staining as the work progresses. Cover brick with 6mil polyethylene sheets to protect brick finishes.
- .2 Protect all adjacent materials (i.e. precast concrete, aluminum windows, metal cladding, hollow metal frames etc.) from mortar droppings.

3.9 CLEANING

- .1 Clean clay masonry units as work progresses.
- .2 Do all cleaning at completion of work in conformance with Section 01 74 00.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED WORK

.1	Joint Sealants	Section 07 92 00
.2	Glazed Aluminum Curtain Walls	Section 08 44 13
.3	Aluminum Windows	Section 08 51 13

Materials

1.2 STANDARDS

- .1 CAN/ULC-S710.1 Standard for Thermal Insulation Bead Applied One-Component Polyurethane Air Sealant Foam, Part 1: Material Specification; Class I
- .2 CAN/ULC-S710.2 Standard for Thermal Insulation Bead Applied One-Component Polyurethane Air Sealant Foam, Part 2: Application
- .3 ASTM E84 Standard Test Method for Surface Burning Characteristics for Building
- .4 ASTM E814 Standard Test Method for Fire Tests of Through-Penetration Fire Stops

1.3 **SUBMITTALS**

- .1 Submit samples to 01 33 23.
- .2 Submit manufacturer's affidavits that the products meet or exceed specified requirements and listed standards. Submit in accordance with Section 01 33 23.
- .3 Submit manufacturer/s project data for materials, providing descriptions suitable for identification of products on site. Include manufacturer's printed installation instructions.

1.4 STORAGE AND HANDLING

- .1 Deliver and store materials in the original packaging, with manufacturer's seals and labels intact. Store and protect from damage in accordance with manufacturer's recommended procedures.
- .2 Keep containers tightly closed when not in use.
- .3 Keep Products away from direct sunlight.
- .4 Do not incinerate aerosol canisters.

1.5 WARRANTY

.1 Provide extended warranty to **two (2) years** from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 **MATERIALS**

- .1 Insulating Foam Sealants:
 - .1 Low Pressure Type, for windows and doors:
 - .1 Semi-flexible soft, single-component polyurethane foamed-in-place sealant, to CAN/ULC-S710.1; and having the following properties:
 - .1 Core Density (ASTM D1622): 27.24 kg/m³
 - .2 Fire Resistance (ASTM E84): Flame spread = 10, Smoke Developed = 20
 - .3 Cure Time: approximately 12 hours
 - .4 Tack-free Time: 6-9 minutes
 - .2 Great Stuff Pro Window & Door Insulating Foam Sealant by Dow Chemical Canada
 - .2 General Purpose:
 - .1 Semi-rigid single-component polyurethane foamed-in-place sealant to CAN/ULC-S710.1; and having the following properties:
 - .1 Thermal Resistance: minimum RSI 0.67/25mm (R-3.8/inch)
 - .2 Fire Resistance (ASTM E84): Flame spread = 15, Smoke Developed = 20.
 - .3 Cure Time: approximately 1 hour.
 - .4 Tack-free Time: 6-7 minutes.
 - .2 Great Stuff Pro Gaps and Cracks Insulating Foam Sealant by Dow Chemical Canada.
- .2 Flexible Foam Sealant:
 - .1 One-component, minimal-expanding, flexible polyurethane foam to CAN/ULC-S710.1 material specification.
 - .2 Class I, with maximum flame spread rating of 25 and a maximum smoke developed rating of 50.
 - .3 Enerfoam Professional Foam Sealant as manufactured by Dow Chemical Canada.
- .3 Primer : As recommended by sealant manufacturer.
- .4 Substrate Cleaner: Non-corrosive type as recommended by sealant manufacturer and approved for use by manufacturers of substrate products.

PART 3 - EXECUTION

3.1 **INSTALLATION**

- .1 Examine joints before sealing to ensure that Configuration, surfaces, and widths are suitable for sealant and service, and that execution of sealing and performance of sealant will not be adversely affected. Defective work resulting from application to unsatisfactory joint conditions will be considered the responsibility of those performing the work of this section.
- .2 Where foam sealants are used around windows and doors, use only low pressure type.
- .3 Install materials in accordance with manufacturer's printed instructions, as acceptable to Authorities Having Jurisdiction, and to the Consultant/s satisfaction.
- .4 Proceed with air sealant only when air, substrate and surfaces in contact with air sealant are completely dry.
- .5 Apply foamed-in-place air sealant foam when ambient air temperature is greater than -3 °C and less than 44 °C.
- .6 Prepare joints by brushing, scrubbing, scraping or grinding inner face surfaces to remove loose mortar, dust, oil, grease, oxidation, mill scale, and other materials which will affect adhesion and integrity of sealant, and dry with clean cloths. Ensure that surfaces have not been coated with releasing agents, coating or other treatments, or that they are entirely removed.
- .7 Finished joints to be free of air pockets, imbedded foreign materials and cut back after curing to be flush with surrounding materials.
- .8 Do not allow sealants to cover or spot surfaces outside of joints. Use masking tape to prevent, if necessary.
- .9 Seal all joints where air leakage can occur, including at joint shoes, under base plates, between door and window frames and rough openings, around electrical and plumbing boxes and conduits that penetrate vapour barriers, around ceiling fixtures that penetrate attics, air ducts and over top of exterior walls including wall plates at underside of slabs, metal decks, and precast slabs. An at any other location specified on the drawings, or in the caulking schedule, for air leakage sealing. Do not attempt to seal gaps wider than 75mm.
- .10 Insulating foam sealant is not to be relied upon as a permanent air/vapour barrier, and does not replace the requirement for a fully continuous air/vapour barrier seal with the specified air/vapour barrier system components specified elsewhere.
- .11 Where air leakage sealant is to be faced by other caulking materials for finishing purposes, ensure sealant is cut back or recessed to sufficient depth for finishing caulking.
- .12 Foam air sealant may not be permanently exposed to ultra-violet radiation; paint or cover exposed foam.

3.2 CLEANING AND PROTECTION

- .1 Remove from surfaces of other work sealant smears, droppings and masking tape immediately after sealant has cured to a hard surface film.
- .2 Clean surfaces soiled by work of this Section. Do not use cleaning methods that will damage surrounding surfaces. Make good work cleaning has damaged under work of this Section.
- .3 Upon completion of work, remove materials, equipment and debris from site. Leave installed work protected from damage for duration of construction period.

END OF SECTION

PART 1 - GENERAL

1.1 **RELATED WORK**

.1	Air Sealant Foam	Section 07 27 10
.2	Glazed Aluminum Curtain Wall	Section 08 44 13

- 2 Glazed Aluminum Curtain Wall Section 00 44 13
- .3 Aluminum Windows Section 08 51 13

1.2 **REFERENCE STANDARDS**

- .1 ASTM International:
 - .1 ASTM C 510 Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants
 - .2 ASTM C 719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)
 - .3 ASTM C 794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
 - .4 ASTM C 834 Standard Specification for Latex Sealants
 - .5 ASTM C920Standard Specification for Elastomeric Joint Sealants
 - .6 ASTM C 1087 Standard Test Method for Determining Compatibility of Liquid- Applied Sealants with Accessories Used in Structural Glazing Systems
 - .7 ASTM C 1193 Standard Guide for Use of Joint Sealants
 - .8 ASTM C 1247 Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids
 - .9 ASTM C 1248 Standard Test Method for Staining of Porous Substrate by Joint Sealants
 - .10 ASTM C 1311 Standard Specification for Solvent Release Sealants
 - .11 ASTM D 2203 Standard Test Method for Staining from Sealants

1.3 **APPROVED MANUFACTURERS**

- .1 The products of the following manufacturers are approved for use subject to meeting the specifications for the particular type of sealants listed below. However, this is not an approval to substitute another type of sealant for those specified unless the material manufacturer requests change in his product in writing to the Consultant.
 - .1 Canadian General Electric Company Ltd.
 - .2 Dow Corning Canada Inc.
 - .3 Tremco
- .2 Material manufacturers must be willing to review Shop Drawings and drawing details, visit the site to review sealant installation and provide written reports to the Consultant.

1.4 **INSTALLER QUALIFICATIONS**

.1 Sealants and caulking shall be installed by a specialized Subcontractor, having skilled mechanics thoroughly trained and competent in all aspects of caulking work, with minimum 5 years documented experience.

1.5 **SUBMITTALS**

.1 Submit samples of each sealant, in conformance with Section 01 33 23.

- .2 Provide colour cards for Consultants selection.
- .3 Submit written adhesion and compatibility approval from the sealant manufacturer for all materials to be sealed.

1.6 WARRANTY

- .1 Extend Contractor's warranty to **five (5) years**, in writing. Warranty shall commence on the date of Substantial Performance.
- .2 Defective work shall include, but not be restricted to, joint leakage, cracking, crumbling, melting, running, loss of adhesion, loss of cohesion, or staining of adjacent surfaces
- .3 Provide manufacturer's project-specific 20 year non-staining warranty and 10 year weatherseal warranty for "Type A" sealant listed below.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Sealant Type A: For exterior locations. Non-Staining, primer less, silicone weather-proofing sealant:
 - .1 SilPruf SCS9000 NB, manufactured by Canadian General Electric Company Limited,
 - .2 Dow Corning 756 SMS, manufactured by Dow Corning Canada Inc., or
 - .3 Spectrem 3, manufactured by Tremco Ltd., and
 - .4 conforming to the product properties published.
 - .5 to ASTM C920 Type S, Grade NS, Class 50, Use NT, M, G, A, and O
- .2 Sealant Type B: For interior locations. Non-staining, primer less, silicone hybrid sealant:
 - .1 SCS7000, manufactured by Canadian General Electric Company Limited.
 - .2 Dow Corning 756 SMS, manufactured by Dow Corning Canada Inc., or
 - .3 Spectrem 3, manufactured by Tremco Ltd.
 - .4 to ASTM C920 Type S, Grade NS, Class 50, Use M, G, A, and O
- .3 Sealant Type C: For interior locations where conditions of high humidity exist such as washrooms. Mildew resistant, one component silicone conforming to CGSB 19-GP-22M and ASTM C920:
 - .1 CGE SCS1700 Sanitary Sealant,
 - .2 Dow Corning 786, or
 - .3 Tremco Tremsil 200 White
- .4 Sealant Type D: For interior locations. Paintable, non-staining, primer less, silicone hybrid sealant:
 - .1 SCS7000, manufactured by Canadian General Electric Company Limited.

- .5 Sealant Type E:
 - .1 One-part, moisture cure, medium modulus silicone sealant; Contractors Weatherproofing Sealant (CWS) BY Dow Corning; to ASTM C 920 Type S, Grade NS, Class 50, Use NT, M, A, O (granite).
 - .2 One-part, moisture-cure, low-modulus silicone sealant; Contractors Concrete Sealant by Dow Corning; to ASTM C 920 Type S, Grade NS, Class 50, Use T, NT, M, G, A, O.
- .6 Colours of sealants and caulking when exposed in the finished work to later selection by the Consultant. Allow different colours for different situations and materials. Allow for custom colours for exterior sealants.
- .7 Primers for sealing: As manufactured or recommended by the manufacturer of the sealing materials for the specific applications.
- .8 Joint backing material:
 - .1 circular foam strips, of approved manufacture, compatible with sealant and 50% greater width than joint width;
 - .2 Vertical Surfaces: extruded polyolefin foam, Sof Rod by Tremco Ltd.
 - .3 Horizontal Surfaces: closed cell polyethylene foam, Standard Backer Rod by Tremco.
- .9 Bond Breaker: pressure sensitive plastic tape backing material, which will not bond to sealant; 3M #226 or #481, or Valley Industries #40.
- .10 Cleaning material for surfaces to receive sealant to be as recommended by the manufacturer of the sealant.

PART 3 - EXECUTION

3.1 LOCATIONS

- .1 Seal all exterior junctions and joints wherever required to close gap and wherever sealant is essential to maintain the continuity of air barrier, water barrier, or non-rated smoke separation of wall with Sealant Type A. Areas to be caulked include:
 - .1 Concrete to metal, masonry, concrete and precast concrete.
 - .2 Masonry to metal, concrete, precast concrete, and masonry.
 - .3 Metal to metal, masonry, concrete, and precast concrete.
 - .4 Around pipes and conduit through foundation walls.
 - .5 Between hollow metal frames and screens and adjacent materials.
 - .6 Between metal siding and metal panels and adjacent materials.
 - .7 Between window, louvre, and skylight frames and sills and adjacent materials.
 - .8 At all control and expansion joints.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 92 00 - JOINT SEALANTS

- .2 Seal all interior junctions and joints wherever required to close gap and wherever sealant is essential to maintain the continuity of air barrier, water barrier, or non-rated smoke separation of wall with Sealant Type B. Areas to be caulked include:
 - .1 Concrete to metal, masonry, concrete and precast concrete.
 - .2 Masonry to metal, concrete, precast concrete, and masonry.
 - .3 Metal to metal, masonry, concrete, and precast concrete.
 - .4 Around pipes and conduit through walls.
 - .5 Between hollow metal frames and screens and adjacent materials.
 - .6 Between window, louvre, and skylight frames and sills and adjacent materials.
 - .7 At all joints between millwork and masonry, to provide neat junction.
 - .8 At junction between all counters and/or splashbacks and adjacent substrate with neat 3mm bead.
 - .9 At all control and expansion joints.
- .3 Seal with Sealant Type C at the following locations:
 - .1 Around access panels in ceramic tile faced walls with a neat 3mm bead.
 - .2 Around perimeter of piping penetration at tile work.
 - .3 At junctions between all counter tops and/or splashbacks and adjacent substrate in washrooms, with neat 3mm bead.
 - .4 At junctions of lavatories, toilets, and other plumbing fixtures and adjacent substrate.
- .4 Seal with Sealant Type D at all interior non-moving joints to be painted.
- .5 Seal at all other vertical and horizontal joint locations with Sealant Type E.
- .6 Refer to Section 07 84 00, Firestopping and Smoke Seal, for location of fire stopping and fire resistant caulking.
- .7 Refer to Section 09 29 00, Gypsum Board, for acoustic sealant work.

3.2 SUPERVISION

- .1 Unless specified otherwise herein comply with the recommendations and directions of the manufacturer whose materials are being used on the work.
- .2 Arrange for the sealant manufacturer's technical representatives to visit the site prior to the commencement of the sealing to meet with the Contractor and the Consultant.

.3 Sealant manufacturer to visit site periodically and to provide written reports to Consultant ensuring sealant is in accordance with good trade practice, the manufacturer's recommendations and the intent of this Specification.

3.3 **PREPARATION**

- .1 Install sealants only when surfaces and ambient temperatures are suitable for the material used, as per manufacturer's recommendations.
- .2 Clean all joints and spaces to be sealed.
- .3 Ensure that surfaces are structurally sound, free from grease, chalk or other contaminants which may adversely affect the adhesion of the sealing materials. Use dry oil free clean compressed air stream if necessary to clean out the joint.
- .4 Clean surfaces with a solvent or cleaner recommended by the manufacturer of the sealant materials.
- .5 Remove chalk lines completely. Do not place clear sealant over coloured chalk lines.
- .6 Test materials for indications of staining or poor adhesion before any sealing is commenced.
- .7 Submit colour chart to Consultant and obtain his written instructions for colours and locations of colours.

3.4 **PRIMING**

- .1 If recommended by the manufacturer of the sealing materials, prime joints to prevent staining, or to assist the bond, or to stabilize porous surfaces.
- .2 Apply primer with a brush which will permit the priming of all joint surfaces.

3.5 MASKING

.1 Where necessary to prevent contamination of adjacent surfaces, mask the areas adjacent to the joints with masking tape.

3.6 **INSTALLATION**

- .1 Install joint backing materials at all locations as detailed or where required by sealant manufacturer's printed directions.
- .2 Install a bondbreaker tape or packing over asphalt impregnated fibre board as recommended by sealant manufacturer.
- .3 Ensure that the correct sealant depth is maintained.
- .4 Finished joints shall be free of wrinkles, sags, air pockets, ridges and embedded impurities.
- .5 Tool all sealant surfaces to produce a smooth surface.

DIVISION 07 - THERMAL AND MOISTURE PROTECTION

SECTION 07 92 00 - JOINT SEALANTS

- .6 Remove droppings and excess sealant as work progresses and before material sets.
- .7 Sealing materials shall be gun grade or tool grade consistency to suit the joint conditions.
- .8 Commence sealing only after all adjacent surfaces have been painted under Painting Section.

3.7 CLEANING

.1 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess sealant and droppings using recommended cleaners as work progresses. Remove masking after joint tooling.

END OF SECTION

PART 1 - GENERAL

1.1 SCOPE OF WORK

- .1 Rehabilitation of existing glazed aluminum curtain wall systems, including the following:
 - .1 New gaskets, seals, pressure plates and caps at full extent of curtain walls.
 - .2 New awning vents in place of existing fixed glazing panels where indicated on drawings and replacement of all existing awning vents with new.
 - .3 New fixed double glazed units to replace existing in existing frames, where operable vents are not required.
 - .4 New glazed spandrel panels and insulated aluminum-faced infill panels. Provide glazed spandrel panels to replace all metal panels in existing curtain walls, except where new aluminum-faced panels are indicated on drawings.
 - .5 Removal and disposal of existing components to be replaced.
- .2 Sealants for work of this section and between curtain walls and adjacent construction
- .3 Accessories necessary to complete Work.

1.2 **RELATED WORK SPECIFIED ELSEWHERE**

.1	Demolition and Alterations	Section 02 40 00
.2	Joint Sealants	Section 07 92 00
.3	Aluminum Windows	Section 08 51 13
.4	Glazing	Section 08 81 00

1.3 **REFERENCE STANDARDS**

.1 AAMA/WDMA/CSA 101/I.S.2/A440 NAFS - North American Fenestration Standard/ Specification for Windows, Doors, and Skylights

.2 American Architectural Manufacturers Association (AAMA):

	.1	AAMA-CW-1-9	Aluminum Curtain Wall Design Guide Manual
	.2	AAMA-CW-10	Curtain Wall Manual #10, Care and Handling of Architectural Aluminum From Shop to Site
	.3	AAMA-GSM-1	Metal Curtain Wall, Window, Store Front and Entrance Guide Specifications Manual
	.4	AAMA 501-1	Standard Test Method for Metal Curtain Walls for Water Pentration Using Dynamic Pressure.
.3	AST	M International:	
	.1	ASTM-A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
	.2	ASTM-A446	Specification for Sheet Steel, Zinc-Coated by the Hot-Dip Process, Structural Quality
	.3	ASTM-B209	Specification for Aluminum and Aluminum-Alloy Sheet and Plate

.4	ASTM-B221	Specification for Aluminum-Alloy Extruded Bars, Rods, Wire,
		Shapes and Tubes
.5	ASTM E119	Standard Test Methods for Fire Tests of Building Construction and Materials.
.6	ASTM E2010	Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
.7	ASTM-E283	Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors.
.8	ASTM E 330	Test for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
.9	ASTM-E331	Test Method for Water Penetration Through Exterior Windows, Curtain Wall and Doors by Uniform Static Air Pressure Difference

.4 Canadian General Standards Board (CGSB):

.1	CAN/CGSB-12.1	Tempered or Laminated Safety Glass
.2	CAN/CGSB-12.9	Spandrel Glass
.3	CAN/CGSB-12.20	Structural Design of Glass for Buildings
.4	CAN/CGSB-19.13	Sealing Compound, One Component, Elastomeric Chemical Curing
.5 .6	CAN/CGSB-19.24 CAN/CGSB-51.10	Multi-Component, Chemical Curing Sealing Compound Mineral Fibre Board Thermal Insulation

.5 Canadian Standards Association (CSA):

.1	CSA A440S1	Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440,
		NAFS - North American Fenestration Standard/Specification for
		Windows, Doors, and Skylights
.2	CAN/CSA-G40.21	Structural Quality Steels

- .3 CSA-S136 Cold Formed Steel Structural Members
- .4 CAN/CSA-S157 Strength Design of Aluminum
- .5 CSA-W59.2 Welded Aluminum Construction

.6 Underwriters Laboratories of Canada (ULC)

.1 CAN/ULC-S705.1 Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material Specification

- .7 Glass Association of North America.
 - .1 GANA Glazing Manual
 - .2 GANA Sealant Manual
 - .3 GANA/GTA 66-9-20 Specification for Heat-Strengthened or Fully Tempered Ceramic Enameled Spandrel Glass for Use in Building Window/Curtain Walls and Other Architectural Applications.
- .8 Do sealant work in accordance with Section 07 92 00 unless otherwise specified herein.
- .9 Do glazing work in accordance with Section 08 81 00 unless otherwise specified herein.

1.4 DESIGN

.1 Conform to requirements of Ontario Building Code, including Supplementary Standard SB-10, and requirements of all authorities having jurisdiction.

- .2 Design to provide:
 - .1 Resistance to pressure differentials.
 - .2 Adequate provisions for thermal movement without thermal fractures.
 - .3 Adequate provision for live and dead loads without failure, distortion or fracture.
 - .4 For differential movement of structural live load deflection.
 - .5 Adequate support and anchorage of components taking into consideration all loading factors.
 - .6 Meet requirements of Rain Screen principle including:
 - .1 Provision of gaskets, baffles, overlaps and seals as required to provide a "Rain Screen" barrier effectively to deter rain water entry into the cavities of the system.
 - .2 Incorporation of air seals to effectively prevent air passage from the system into the building and vice versa.
 - .3 Air and vapour seals required to minimize airborne vapour exfiltration from the building into the system cavities.
 - .4 Openings between system cavities and the outside of sufficient cross-sections to provide pressure equalization. All such openings to be effectively drained to allow moisture entering cavity to escape.
 - .7 A continuous air seal from the non-glass wall systems air seal to the aluminum curtain wall frame and from there to the inside glass face. These seals shall be made in such a manner that with anticipated structural and thermal movement there will be no break in the seal.

1.5 **SUBMITTALS**

- .1 Submit shop drawings in accordance with Section 01 33 23.
 - .1 Submit shop drawings for all panel work. Show joinery techniques, provisions for horizontal and vertical expansion, glass and metal thicknesses, and framing member profiles. Identify all materials, including metal alloys, glass types, fasteners, and glazing materials. Identify all shop and field sealants by product name and locate on drawings. Show relative layout of all adjacent walls, beams, columns and slabs', all correctly dimensioned. Dimension position of glass edge relative to metal profile. Make no changes in design sight lines.
 - .2 Submit twice full size detail drawings indicating step-by- step fabrication and fabrication tolerances of air seal pan to mullion shoulder conditions complete with balancing leg.
- .2 Submit written compatibility approval from sealant manufacture that all products in contact with the sealant are compatible.

- .3 Samples
 - .1 Submit samples of finishes, sealed glazing units, gaskets, tapes and sealants.
 - .2 Submit samples of coloured spandrel glass for selection of final colours by the Consultant, as specified in Section 08 81 00.

1.6 **QUALITY ASSURANCE**

- .1 Subcontractor must have ten years experience in the installation of aluminum curtain walls, in installations of similar scope and shall be approved by the manufacturer for this installation. Curtain wall components shall be by same manufacturer as aluminum windows.
- .2 This Subcontractor must warrant the supply and installation of all Work of this Section.

1.7 **PERFORMANCE REQUIREMENTS**

- .1 Minimum design wind pressure, both positive and negative and acting normal to the plane of the wall, shall be in accordance with requirements of the O.B.C., Live Loads Due to Wind and all other relevant sections.
- .2 Provide horizontal closures for all vertical space to prevent chimney/stack effects.
- .3 Provide clearance for thermal movement within a surface temperature range of -40 deg. C to 70 deg. C. Provide additional clearance as required to accommodate erection tolerance.
- .4 When tested in accordance with AAMA 501-83 and ASTM E 283, air infiltration or exfiltration from all sources, must not exceed 0.6 cfm/sq ft at 1.56 psf pressure differential.
- .5 Water Infiltration:
 - .1 Water infiltration, in this Specification, is defined as the appearance of uncontrolled water on the room side of any part of the wall.
 - .2 Design shall drain to exterior face of wall any leakage of water occurring at the joints and any condensation taking place within curtain wall construction.
 - .3 No water infiltration under static pressure shall occur when wall is tested in accordance with AAMA 501-83 and ASTM E 331 at differential static pressure of 48.8 kg/m² (10 lb/sq ft.) No water infiltration under dynamic pressure shall occur when wall is tested in accordance with AAMA 501 and AAMA 501.1 with a wind velocity of 129 km per hour.
- .6 Conform to Ontario MMAH Supplementary Standard SB-10 and ASHRAE 90.1.

Fenestration Type	Max. U value (W/m ² •K)	Max. SHGC	Min. VT/SHGC
Metal Framed, Fixed	U-2.15	0.40	1.10
Metal Framed, Operable	U-2.56	0.40	1.10
Metal Framed Entrance door	U-3.94	0.40	1.10

.1 Conform to SB-10 table SB5.5-5-2017, for Climate Zone 5, as follows:

- .2 Conform to ASHRAE 90.1, subsection 5.4.3.2, for fenestration and doors. When tested as indicated, air leakage shall not exceed:
 - .1 Curtainwall and storefront glazing: 0.06 cfm/ft²
 - .2 Swinging entrance doors: 1.0 cfm/ft^2
 - .3 Other metal framed fenestration:
 - .1 0.2 cfm/ft² when tested at a pressure of 1.57 lbs/sq.ft. in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 or NFRC 400;
 - .2 or 0.3 cfm/ft² when tested at a pressure of 6.24 lbs/sq.ft. in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

1.8 **DELIVERY, HANDLING, STORAGE**

- .1 Adequately protect and crate all components against damage and wracking.
- .2 Coordinate deliveries to comply with construction schedule and arrange ahead for strategic off the ground, under cover storage locations.

1.9 EXTENDED WARRANTY

- .1 Provide extended warranty covering new curtain wall work for a period of **five (5) years** from date of Substantial Performance of the Work.
- .2 Provide extended warranty for glass sealed units for a period of **ten (10) years** from date of Substantial Performance of the Work.
- .3 Warrant that installation will be free of defects in materials and workmanship including:
 - .1 curtain wall panel installation shall remain water and weathertight at all times and fulfill all requirements of the Design Criteria and Specifications.
 - .2 finishes on aluminum will not change in colour or otherwise deteriorate.
 - .3 replacing and making good, at no extra cost, of any defects, including breakage of glass, caused by incorrect setting of glass, shims, and spacers, defective fabrication of glass units, thermal fracture, failure to provide sufficient clearance for deflections of structural frame.
 - .4 make good damage to other work caused by defects of the work of this Section and make good such defects.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Manufacturer of curtain wall products shall be the same for aluminum windows. Accetable manufacturers are Oldcastle Building Envelope, Aerloc Industries Ltd., Kawneer Company Inc, Windspec Inc., Allwind Industries Ltd., Commdoor Aluminum, Sherwood Windows Ltd., and Alumicor Ltd.
- .2 New components shall be closely matched in profile and dimensions to those in the existing curtain walls, to the approval of the Consultant, with wall thicknesses, gauges and reinforcement required to meet the performance standards specified herein.

2.2 MATERIALS

.1	Extruded Sections:	Extruded aluminum alloy 6063-T5 free from scratches and surface blemishes, min. 3mm thick.
.2	Sheet and Plate:	1100-H14 alloy, Utility grade, minimum 3mm thick. Exposed material to be anodizing quality.
.3	Finish:	Clear Anodized finish conforming to AA- M32.C22.A31, to Consultants approval.
.4	Steel:	Conforming to CAN/CSA G40.21, type 33W hot dip galvanized with minimum coating of G90 zinc to CSA G-164.
.5	Cast-in Anchor Channels and accessories: .1 As manufactured by Hilti Corp, and supplied in Canada by Hilti (Canada) Corp	

- .6 Glass and Glazing:as specified in Section 08 81 00
 - .1 Insulating Glass Units:Glazing specified is a minimum; glazing units incorporated into curtainwall shall be as required for complete units to meet the requirements of MMAH Supplementary Standard SB-10.
 - .2 Provide spandrel glass with ceramic frit, as specified.
 - .3 Glazing Accessories: ensure glazing tape and setting blocks are compatible with sealant.
- .7 Insulation: Curtainrock by Rockwool, 127mm thick or as shown on Drawings.
- .8 Fasteners: Self-tapping cadmium plated steel for aluminum to aluminum contact and stainless steel for aluminum to steel contact, and where exposed to weather.
- .9 Bituminous Paint: Conforming to CGSB 1-GP-108M, Type 2 and zinc chromate primer conforming to CGSB 1-GP-132M.

.10	Compressible Seal:	Type recommended by sealant manufacturer, of thicknesses required to provide 50% compression when in place. Self-extinguishing to ASTM D1692.
.11	Setting Blocks:	Type recommended by sealant manufacturer, 100mm long, wide enough to extend from stop to stop, as required.
.12	Thermal Separator:	Semi-rigid polyvinyl chloride with a durometer hardness.
.13	Curtain Wall Sealant:	Silicone of type selected by manufacturer for application. Manufacturer to be Dow Corning Canada Inc., Canadian General Electric Company Limited, or Tremco. All materials to be from one manufacturer.
.14	Joint Sealants:	Sealant Type A as specified in Section 07 92 00, for sealing of wall/window penetrations. Sealant must be fully compatible with air/vapour barrier membrane. Colour to be as selected by the Consultant.
.15	Insulating sealant:	expanding foam sealant; refer to Section 07 27 10.
.16	Joint Backing:	Non-staining, non-absorbent material recommended by sealant manufacturer. Density 29 kg to 35 kg/m ³ . Size as required to provide 30% compression when installed. Use primer if recommended by sealant manufacturer.
.17	Air Seal Liners:	Sheet steel with galvanized coating of G90 conforming to CSA G-164.
.18	Flexible Flashing:	Lexsuco FR40, concealed flashing and waterproofing.
.19	Teflon washers at slip connections.	

.20 Inner Frame Insulation: foamed-in-place polyurethane insulation conforming to CAN/ULC-S705.1.

2.3 **FINISHES**

.1 Finish all aluminum with clear anodized finish.

2.4 **FABRICATION**

- .1 All mullions, glazing pressure plates, glazing caps to be aluminum or stainless steel. The use of plastic or hard rubber components other than as thermal breaks or sealants are not acceptable.
- .2 Provide outward opening awning style vents where indicated on drawings. Vents shall be complete with hardware and insect screens, all as specified in Section 08 51 13 for windows.
- .3 Jointing and intersections of metals shall be accurately cut, fitted to a tolerance of 0.8mm in true planes with adequate concealed fastenings. Cut or mill out sections for sealant beads where required.
- .4 Mullion caps shall be extruded aluminum section of wall thickness and size required.

DIVISION 08 - OPENINGS

SECTION 08 44 13 - GLAZED ALUMINUM CURTAIN WALLS

- .5 Provide inconspicuous holes for drainage and pressure equalization of spaces in curtain wall.
- .6 Component fastenings, concealed throughout, adequate strength, stainless steel.
- .7 Perform fitting and assembly of operable vents in shop insofar as practicable. Work that cannot be permanently shop assembled shall be fitted, assembled, marked and disassembled to assure proper fitting in the field. Identify shop assembled components on shop drawings for location and erection at site.
- .8 Sealed double glazing units:
 - .1 pay particular attention to proper finishing of edges of assembled units in that they must be clean cut without wings, convolutions, shark teeth, serration hackle, flare, bevel and chips. No metal edges.
 - .2 Units will be rejected for installation into finished curtain wall if not in conformity with these requirements.
- .9 Aluminum cover and shaped pieces:
 - .1 ensure that cover or shapes are smooth and completely free from distortion, oil canning, anchor attachment marking, surface colour variations and any other defect which will detract from the final installation.
 - .2 Pieces not in conformity with these requirement will be rejected for installation into finished curtain wall or required surfaces.
- .10 Provide all flashings as required at curtain wall. Co-ordinate with reinstallation of sheet metal flashing at roof.
- .11 Insulated Spandrel Panels:
 - .1 Exterior of spandrel panels to be minimum 6mm spandrel glass. Confirm colours with Consultant prior to fabrication.
 - .2 Interior to be 3mm aluminum sheet with clear anodized finish where exposed to view, or 0.86mm galvanized sheet steel where fully concealed, with rigid stone wool insulation adhered to interior on pins secured with large washers. Reinforce interior panels as required to prevent undue deflection or oil canning.
 - .3 Seal perimeter of inner panel to ensure continuity of vapour/thermal barrier.
 - .4 Isolate materials where required to prevent electrolytic action.
- .12 Insulated Aluminum Panels:
 - .1 Where indicated on drawings, provide insulated panels in aluminum frames. Panels shall be fabricated of 3mm thick aluminum plate on exterior surface, clear anodized finish to match framing.
 - .2 Interior to be 3mm anodized aluminum sheet where exposed. Where concealed, interior to be 1mm aluminum sheet or 0.86mm galvanized sheet steel. Provide rigid stone wool insulation adhered to interior on pins secured with large washers. Reinforce interior panels as required to prevent undue deflection or oil canning.

- .3 Seal perimeter of inner panel to ensure continuity of vapour/thermal barrier.
- .4 Isolate materials where required to prevent electrolytic action.

PART 3 - EXECUTION

3.1 **EXAMINATION**

- .1 Verifying Conditions:
 - .1 Check existing conditions on which work is dependent, verify governing dimensions, floor elevations, floor to floor heights, and minimum clearances between curtain wall and structural frame.
 - .2 Confirm conditions are satisfactory before proceeding with installation.
- .2 Commencement of erection will denote acceptance of surfaces and any subsequent faults occurring in erected work due to unsatisfactory conditions of surfaces, will be rectified as no cost to the Owner.

3.2 **PREPARATION**

- .1 Coordinate with forces removing and replacing existing cap flashing at roof, where it overlaps top of curtain wall frames.
- .2 Do all removals of existing components to be replaced. Time removals with new work to ensure that openings are not left unprotected.
- .3 Remove, and dispose of, all mullion caps, pressure plates, gaskets, seals, operable vents, and insulated metal panels, complete with all hardware and fasteners. Remove fixed glazed panels which are to be replaced with new operable vents. Clean remaining curtain wall components to remain.

3.3 INSTALLATION

- .1 Tolerances:
 - .1 Allow for dimensional tolerances and erect curtain wall members and component parts plumb, level and true to building lines.
 - .2 Permissible tolerance for the alignment of adjoining component sections and joints between metal components shall not exceed 0.8mm.
- .2 Insulation and Protective Coatings:
 - .1 Backpaint aluminum and steel surfaces in contact with concrete, surfaces between dissimilar metals, one coat of bitumastic paint.
 - .2 Touch up field welds in steel with two coats of zinc chromate paint.
- .3 Assembly:
 - .1 Joints and intersections accurately fitted in true planes, free of distortion, waves, twists, buckles or other defects detrimental to appearance or performance. Prevent damage to metal finish.

- .4 Seals:
 - .1 Fit flexible seals, tapes, formed neoprene deflectors and gaskets at locations indicated and required to provide water and weathertight junctions. Ensure seal at end joints between lengths of material.
 - .2 Caulk junctions of system components to themselves and other work with sealant to maintain effective vapour, air barrier and provide rain screen function.
 - .3 Clean spaces and joints to be caulked of foreign matter that would injure bond, wipe all metal surfaces to be sealed with cellulose sponges or clean rags soaked with a approved material, and wipe dry with clean cloth, prime surfaces as recommended by sealant manufacturer.
 - .4 Sealant beads shall have ethafoam or equal back surface form and depth shall be ½ bead width but not less than 6mm. Use pressure gun having proper sized nozzles to fit the various joint widths. Tool and finish joints. immediately clean adjacent materials which have been soiled.
- .5 Insulation:
 - .1 Accurately fit spandrel liner in space and secure against movement. Seal perimeter junction to frame, corner junctions of frame and screw fixings.
 - .2 Cut insulation to shapes and sizes required as much as practicable and fill all spaces and cavities remaining with loose insulation.
- .6 Remove existing joint sealants and reseal perimeter frames to adjacent materials using joint sealant specified above.
- .7 Provide for continuity of air/vapour barrier and connect to existing vapour retarder where it is present.

3.4 GLAZING

- .1 Glazing shall be as specified in Section 08 81 00.
- .2 Frames and glass shall be free from moisture, frost, dirt, cement, plaster, oil and grease.
- .3 Centre glass using setting blocks and recommended glazing tape, set in accordance with manufacturer's written instructions and Section 08 81 00.

3.5 CLEANING

- .1 Refinish shop-applied finishes in field only with approval of Consultant.
- .2 Clean off dirt resulting from erection on surfaces exposed to view.
- .3 At all times, keep the premises free from accumulations of waste material or rubbish caused by work, and at the completion of the work, remove all rubbish and all tools, equipment and surplus materials from and about the work and leave the work clean.
- .4 Replace glass broken during the course of the work.
- .5 Remove, as work progresses, all excess or foreign materials or dropping which would set or become difficult to remove from wall cladding surfaces at time of final cleaning.

- .6 Before area is turned over to the Owner, remove temporary protection, clean and polish exterior and exposed interior surfaces of all work of this Section. Use proper cleaning materials and methods to prevent damage to surfaces, finishes, sealers or work of other trades. Make good such damage to the satisfaction of the Consultant.
- .7 Do not use steel wool, wire brushes or steel scrapers on any finished surfaces.
- .8 Upon completion of work of this Section replace or make good all defective, scratched or damaged work to the Consultant's satisfaction, at no extra cost to the Owner.

END OF SECTION

SECTION 08 51 13 - ALUMINUM WINDOWS

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 Glazed aluminum windows with casement and awning style operable vents.
- .2 Glazed aluminum windows shall include thermally broken tubular aluminum sections with self supporting framing, shop fabricated, factory prefinished, glazing, glazed spandrel infill, insulated aluminum panel infill, related flashings, anchorage and attachment devices.
- .3 Sheet metal air/vapour barrier closures and finish closures, and aluminum angle closures at jambs.
- .4 Aluminum covers at posts at corner windows.
- .5 Insulation and air/vapour barrier seals between work of this section and adjacent construction
- .6 Sealants for work of this section and between work of this section and adjacent construction
- .7 Supply and installation of finish hardware for work of this section, including teleflex operators and power operators.
- .8 System to permit replacement of individual glass panels without necessitating removal of structural mullion sections

1.2 **RELATED WORK SPECIFIED ELSEWHERE**

.1	Demolition and Alterations	Section 02 40 00
.2	Insulation and air/vapour barriers	Section 02 40 00
.3	Air Sealant Foam	Section 07 27 10
.4	Sealants	Section 07 92 00
.5	Glazed Aluminum Curtain Walls	Section 08 44 13
.6	Glazing	Section 08 81 00
.7	Window Shades	Section 12 24 00

1.3 **REFERENCES**

.1

.2

.3 .4 .5 .6 .7

.1 AAMA/WDMA/CSA 101/I.S.2/A440

NAFS - North American Fenestration Standard/ Specification for Windows, Doors, and Skylights

.2 Canadian Standards Association (CSA):

CSA A440S1	Canadian Supplement to AAMA/WDMA/CSA
	101/I.S.2/A440, NAFS - North American Fenestration
	Standard/Specification for Windows, Doors, and Skylights
CAN/CSA-A440.2/A440.3	Fenestration energy performance / User guide to CSA
	A440.2, Fenestration energy performance
CAN/CSA A440.4	Window, Door and Skylight Installation
CAN/CSA-G40.21	Structural Quality Steels
CSA-S136	Cold Formed Steel Structural Members
CAN/CSA-S157	Strength Design of Aluminum
CSA-W59.2	Welded Aluminum Construction

Moffet & Duncan Architects Inc.
SECTION 08 51 13 - ALUMINUM WINDOWS

.3	Cana .1 .2 .3 .4 .5 .6	dian General Standards E CAN/CGSB-12.1 CAN/CGSB-12.9 CAN/CGSB-12.20 CAN/CGSB-19.13 CAN/CGSB-19.24 CAN/CGSB-51.10	Board (CGSB): Tempered or Laminated Safety Glass Spandrel Glass Structural Design of Glass for Buildings Sealing Compound, One Component, Elastomeric Chemical Curing Multi-Component, Chemical Curing Sealing Compound Mineral Fibre Board Thermal Insulation
.4	Unde .1	rwriters Laboratories of (CAN/ULC-S705.1	Canada (ULC) Standard for Thermal Insulation – Spray Applied Rigid Polyurethane Foam, Medium Density – Material Specification
.5	ASH	RAE 90.1 Energ	y Standard for Buildings Except Low-Rise Residential Buildings
.6	Amer .1	ican Architectural Manuf AAMA-GSM-1	acturers Association (AAMA): Metal Curtain Wall, Window, Store Front and Entrance Guide Specifications Manual
.7	AST	International:	
	.1	ASTM-A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
	.2	ASTM-A446	Specification for Sheet Steel, Zinc-Coated by the Hot-Dip Process. Structural Quality
	.3	ASTM-B209	Specification for Aluminum and Aluminum-Alloy Sheet and Plate
	.4	ASTM-B221	Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes and Tubes
	.5	ASTM E119	Standard Test Methods for Fire Tests of Building Construction and Materials.
	.6	ASTM E2010	Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.
	.7	ASTM-E283	Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors.
	.8	ASTM E 330	Test for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference
	.9	ASTM-E331	Test Method for Water Penetration Through Exterior Windows, Curtain Wall and Doors by Uniform Static Air Pressure Difference

- Do sealant work in accordance with Section 07 92 00 unless otherwise specified herein. .8
- .9 Do glazing work in accordance with Section 08 81 00 unless otherwise specified herein.

1.4 DESIGN

- .1 Design and fabricate windows, brackets and anchorage devices to provide:
 - Resistance to pressure differentials. .1
 - .2 Adequate provisions for thermal movement without thermal fractures.
 - .3 Adequate provision for live and dead loads without failure, distortion or fracture.
 - For differential movement of structural live load deflection. .4

SECTION 08 51 13 - ALUMINUM WINDOWS

- .5 Adequate support and anchorage of components taking into consideration all loading factors.
- .6 Conformance to Rain Screen principles including:
 - .1 Provision of gaskets, baffles, overlaps and seals as required to provide a "Rain Screen" barrier effectively to deter rain water entry into the cavities of the system.
 - .2 Incorporation of air seals to effectively prevent air passage from the system into the building and vice versa.
 - .3 Air and vapour seals required to minimize airborne vapour exfiltration from the building into the system cavities.
 - .4 Openings between system cavities and the outside of sufficient cross-sections to provide pressure equalization. All such openings to be effectively drained to allow moisture entering cavity to escape.
- .7 For long range shrinkage (creep) of concrete structure.
- .8 A continuous air seal from the non-glass wall systems air seal to the aluminum curtain wall frame and from there to the inside glass face. These seals shall be made in such a manner that with anticipated structural and thermal movement there will be no break in the seal.
- .2 Stairwell windows are to be designed to meet the requirements of the lateral design loads as required for guards and rails as specified by the Ontario Building Code; refer to OBC Division B, section 3.4.6.6.(7). Shop drawings shall include calculations verifying that the above criteria has been met and shall bear the stamp of the Professional Engineer registered in the Province of Ontario.
- .3 All windows above ground floor shall comply with lateral design load of O.B.C. Division B, section 4.1.5.16.
- .4 Deflection of members when under full loads shall maintain adequate clearance of glass. Maximum deflection shall not be more than 1/175 of the span of any member.
- .5 Design window systems to perform as an effective air and vapour barrier.
- .6 Design windows such that glass replacement can be accomplished from the building interior.
- .7 Condensation: Not more than 25mm high across the bottom of inside pane and none on aluminum frames under conditions of 33.3 deg. C. exterior, 22.2 degrees C interior, 30% relative humidity interior 25 m/h wind measured on lee side of building, or zero condensation with no wind.
- .8 Conform to Ontario MMAH Supplementary Standard SB-10 and ASHRAE 90.1.
 - .1 Conform to SB-10 table SB5.5-5-2017, for Climate Zone 5, as follows:

Fenestration Type	Max. U value (W/m ² •K)	Max. SHGC	Min. VT/SHGC
Metal framing: fixed	U-2.15		
Metal framing: operable	U-2.56	0.4	1.1
Metal framing: entrance door	U-3.94		

SECTION 08 51 13 - ALUMINUM WINDOWS

- .2 Conform to ASHRAE 90.1, subsection 5.4.3.2, for fenestration and doors . When tested as indicated, air leakage shall not exceed:
 - .1 Storefront glazing: 0.06 cfm/ft²
 - .2 Entrance doors: 1.0 cfm/ft² for glazed swinging doors
 - .3 Other metal framed fenestration:
 - .1 0.2 cfm/ft² when tested at a pressure of 1.57 lbs/sq.ft. in accordance with AAMA/WDMA/CSA 101/I.S.2/A440 or NFRC 400;
 - .2 or 0.3 cfm/ft² when tested at a pressure of 6.24 lbs/sq.ft. in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
- .3 Label windows in accordance with ASHRAE 90.1 requirements for "Labeling of Fenestration Products". If the units do not have permanent labels, the Subcontractor shall provide a signed and dated certificate for the windows listing the U-value, solar heat gain coefficient, and air leakage rate of the installed products.
- .9 Conform to AAMA/WDMA/CSA 101/I.S.2/A440, Performance Class AW, for institutional application.

1.5 **QUALITY ASSURANCE**

- .1 Window Subcontractor must have ten years experience in the installation of aluminum windows and doors of the type specified, in installations of similar scope, and be approved by the window manufacturer for this installation.
- .2 Installers must provide references for approval by Owner and Consultant prior to Contract award.
- .3 Window manufacturer to provide letter certifying that they are supplying fully assembled window units to the Subcontractor. Assembly of aluminum sections by Subtrades is not permitted.

1.6 **SUBMITTALS**

- .1 Shop Drawings
 - .1 Submit Shop Drawings in accordance with Section 01 33 23. Shop drawings shall be prepared by the window manufacturer, and shall be accompanied by a letter certifying that fully assembled windows are being supplied to the installer.
 - .2 Show detailed assembly, including large scale details of members and materials, of brackets and anchorage devices and of connection and jointing details; full dimensioned layouts for positioning of brackets and anchorage devices to structures; dimensions, gauges, thicknesses; glazing details, description of materials including catalogue numbers, products and manufacturer's names; aluminum alloy and temper designations, finish specifications and all other pertinent data.
- .2 Submit certification of the U-value, solar heat gain coefficient, and air leakage rates for the windows, in accordance with ASHRAE 90.1 and as specified above. This is not required if the windows and doors will have permanent labels indicating these values; indicate on shop drawings if units will bear permanent label.

SECTION 08 51 13 - ALUMINUM WINDOWS

- .3 Submit test data on doors, screens and windows being proposed, prepared by an approved testing laboratory. The window unit described herein shall meet the local requirements for operating vents and fixed framing in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.
- .4 Submit a written adhesion and compatibility approved from sealant manufacturer stating all materials in contact with sealants are compatible.
- .5 Submit samples of glass products in accordance with Section 08 81 00.
- .6 Submit one representative sample window concurrent with Shop Drawing submittal.
 - .1 Show frame, sash, sill, glazing and waterproofing method, insect screens, surface finish and hardware. Include 150 mm. long samples of head, jamb, sill, meeting rail, mullions to indicate profile.
- .7 Provide copies of manufacturers printed maintenance instructions in Maintenance Manuals; refer to Section 01 78 00.

1.7 **DELIVERY AND STORAGE**

- .1 Adequately protect glazing, aluminum and aluminum finishes to prevent damage thereto during fabrication, storage, shipping, handling and installation.
- .2 Deliver, handle and store units by methods approved by manufacturer. Protect from damage and staining.
- .3 Protect glass, sills and stools after installation with boards, heavy paper or other suitable protection, secured in place, to prevent staining or scratching. Do not remove protection until final cleaning.

1.8 **COORDINATION WITH OTHER TRADES**

- .1 Coordinate delivery and installation of windows with removal of existing windows, to ensure that openings are not left unprotected.
- .2 Provide protection of installed windows to prevent breaking of glass during masonry repairs and other work.

1.9 WARRANTY

- .1 Warranty the Work of this Section for a period of **five (5) years** from date of Substantial Performance, in writing. Warranty shall include all products and work to repair or replace defective units.
- .2 Provide an extended warranty to ten (10) years against water leakage.
- .3 In addition to the above, insulating glass units shall carry manufacturer's warranty of **ten (10) years** from date of Substantial Performance of the Work.

SECTION 08 51 13 - ALUMINUM WINDOWS

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- .1 Manufacturer of aluminum windows must be same as manufacturer of curtain wall.
- .2 Aluminum windows specified below are as manufactured by Oldcastle Building Envelope. Products conforming to these specifications as manufactured by Aerloc Industies Ltd., Kawneer Company Inc., Windspec Inc., Allwind Industries Ltd., Commdoor Aluminum, Sherwood Windows Ltd., and Alumicor Ltd. will also be accepted.
- Manufacturer shall supply assembled windows to window Subcontractor. .3
- .4 The Window Subcontractor must warrant the supply and installation of all Work of this Section.

2.2 MATERIALS

.1	Aluminum Extrusions:	Extruded shapes, Aluminum Association alloy AA 6063 T54,mechanically straightened and free of marks, of size and shape specified and detailed, minimum 3mm thick.
.2	Sheet and Plate Aluminum	n: AA 1100 alloy, anodizing quality.
.3	Finish:	Clear anodized finish to Consultant's approval.
.4	Steel Sections and Plates:	to CSA G40.21 Type 300W. Hot dip galvanized with minimum zinc coating of 600g/m ² .
.5	Steel Reinforcing for scree	ens: to CSA G40.20, Class H
.6	Thermal Break:	Rigid PVC or hard rubber.
.7	Bolts, Screws, Fasteners:	Hot dipped galvanized, or cadmium plated steel or 302 stainless steel.
.8	Glass:As specified i.1Glazing must meet.2Use double-glazed u.3Provide spandrel gla.4All colours subject t	n Section 08 81 00. the SB-10 requirements for the climate zone. units for all exterior glazing. ass, with coloured ceramic frit, where indicated on drawings. to confirmation by the Consultant.
.9	Glazing Sealant: C	ne component silicone; Spectrum 2 by Tremco.
.10	BES Sealant: A	as specified in Section 07 92 00. Colour to be as selected by the Consultant.
.11	Air Sealant Foam:refer to	Section 07 27 10.
.12	Setting Blocks: N	leoprene 100mm long, 80A durometer.
.13	Steel: B	rake formed, galvanized sheet steel.

SECTION 08 51 13 - ALUMINUM WINDOWS

- .14 Glazing Tape: Vulcanized butyl tape with continuous neoprene spacer. Colour as selected by Consultant.
- .15 Insect Screens:All opening sash to have side hinged stainless steel mesh screens with aluminum frames to match windows.
- .16 A/V Barrier Tape 3015 Air and Vapour Barrier adhesive tape by 3M
- .17 Aluminum Closures: Closures, caps, flashings, panels, and trim as detailed, from 2mm aluminum; finish to match frame.

.18 Power Operators:

- .1 Power window operating system shall be by Truth Hardware;
 - .1 Sentry II HS for window vents weighing up to 72 kg, and
 - .2 Marvel Power Window Systems for window vents weighing up to 40kg
 - .3 complete with two hand held remote control operators, controlling all operators.
 - .4 wall switches to be keyed or installed in keyed wall box; provide 6 sets of keys.
- .2 Provide all components and accessories required for the complete installation, including all hardware for vents to be operated by this system.
- .3 Provide batteries for all remote control units.

2.3 **FABRICATION**

- .1 Typical aluminum windows shall be Oldcastle Series 1200 thermally broken, rainscreen windows, 25mm x 152mm.
- .2 Framing shall consist of closed tubular aluminum sections, reinforced as necessary, thermally broken. Open channel profiles are not acceptable.
- .3 Make profiles of framing members as shown on Drawings. All perimeter frames shall be fully closed sections, including at corners.
- .4 Operating vents:
 - .1 Opening units to be 2000 Arctic Series Projected Window, outward opening; side hinged casement style vents and top hung vents, as indicated on drawings.
 - .2 Equip each side-hinged vent with three (3) heavy duty prefinished extruded aluminum hinges with stainless steel pins installed at casement jamb, one (1) solid white bronze roto operator installed at casement sill, and one (1) solid bronze 3-point claw handle installed at casement jamb.
 - .3 Equip each top-hung vent with minimum two (2) heavy duty extruded hinges with stainless steel pins, (minimum 3 hinges if vent is more than 750mm wide) with scissors arm operator with high pressure die cast zinc case and solid white bronze roto operator.
 - .4 Coordinate with manufacturer of power operating system for requirements at awning vents to receive power operators. Provide properly sized, counter-balanced, hinges to suit the sash height and weight of awning vents.

SECTION 08 51 13 - ALUMINUM WINDOWS

- .5 Remote Operation:
 - .1 Vents in Cafeteria shall have power operators, as specified above, complete with handheld remote control devices, and keyed wall switches located in centralized location. Coordinate with electrician for provision of power and conduit to operators and switches.
 - .2 Other vents located high above the floor level are to have wall mounted operators with teleflex control cables installed in smooth conduit and neatly surface mounted on walls.
 - .3 Provide all window operating hardware, wall plates and mounting hardware.
- .6 Cut vent corner joint at 45 degrees and swage with 3 heavy duty reinforcing angles per corner. Screwed corners on vents will not be accepted.
- .7 Provide opening limit stops. Limit opening distance generally to 100mm on ground floor and to 150mm at higher levels. Ground floor windows which open over planted landscaping may open to 150mm. Confirm limits with Consultant and Owner.
- .8 Provide insect screens at all operable vents.
- .5 Insulated Glazed Spandrel and Aluminum Panels:
 - .1 Where spandrel panels are indicated on drawings, exterior is to be minimum 6mm spandrel glass. Confirm colours with Consultant prior to fabrication.
 - .2 Where insulated metal panels are indicated on drawings, panel face shall be fabricated of 3mm thick aluminum plate on exterior surface, in clear anodized finish to match framing.
 - .3 Interior to be 2mm clear anodized aluminum sheet, where exposed to view, or 0.86mm galvanized sheet steel where concealed, with 89mm thick rigid stone wool insulation adhered to interior on pins secured with large washers. Reinforce interior panels as required to prevent undue deflection or oil canning.
 - .4 Seal perimeter of inner panel to ensure continuity of vapour/thermal barrier.
 - .5 Isolate materials where required to prevent electrolytic action.
- .6 Entire assembly shall be weathertight throughout.
- .7 Fabricate complete units in shop to provide minimum tolerance and hairline joints throughout.
- .8 Assemble members by stainless steel screws. All connections shall be internally sealed in factory with approved sealing compound. Exposed frame sealants are not acceptable.
- .9 Aluminum extrusions shall be designed to provide sufficient section modules to safely resist imposed loads but minimum thickness of any part of the load bearing extrusion shall be 3mm. Glazing stops may be 1.6mm. Be prepared to submit design data as requested by Consultant.
- .10 Conceal interconnecting members and fasteners in completed assembly.

- .11 Do not place manufacturer's name plates, labels or any other finished means of identification on exposed or finished parts.
- .12 Provide weep holes in tubular members to drain condensation.
- .13 Provide an extruded rigid thermal break integrated with the inner and outer aluminum extrusions to form a rigidly interconnected assembly without the use of fasteners or other thermal bridging elements.
- .14 Glass stops shall provide edge margins recommended by glass manufacturer.
- .15 Paint all metal surfaces in contact with concrete or masonry, plaster, mortar or dissimilar metals with protective lacquer or bituminous coating.
- .16 Mitre and full strength vulcanize joints in weatherstripping.
- .17 Provide 3mm extruded aluminum sills as indicated and to suit wall conditions, complete with chair type anchoring devices at 600mm. o.c. maximum and drip deflectors at sill ends and abutting vertical surfaces.
- .18 Stools, cap flashings, closures, covers and trim shall be minimum 2mm thick aluminum, extruded or formed to profiles shown.
- .19 Aluminum cover and shaped pieces:
 - .1 ensure that covers or shapes are smooth and completely free from distortion, oil canning, anchor attachment marking, surface colour variations and any other defect which will detract from the final installation.
 - .2 Pieces not in conformity with these requirement will be rejected for installation into finished curtain wall or required surfaces.

2.4 GLAZING

- .1 Glaze windows in shop.
- .2 Clean aluminum and glass surfaces that are to receive glazing materials with an oil removing solvent and wipe dry.
- .3 Glaze windows with factory glazed wrap around vinyl glazing channels.
- .4 Place setting blocks at quarter points for each light of glass.
- .5 Comply with tape manufacturer's recommendations regarding use of spacers for certain glass sizes.
- .6 Install glass with clean cut edges, leaving spaces for expansion and contraction between edge of glass and inside of frame as recommended by glass manufacturer.
- .7 Glaze windows with sealed double glazed units of types specified in Section 08 81 00.
- .8 Finish tape and glazing wedge with straight unwaving sight lines.

SECTION 08 51 13 - ALUMINUM WINDOWS

- .9 Conform to sealant manufacturer's written recommendations for cleaning, priming, backing and joint design to suit type and location of joint and environmental conditions. Conform to Section 07 92 00.
- .10 Apply heel of sealant at perimeter of glass. Ensure drainage space below exterior pane to weep holes in frame and install heel bead at inner pane.
- .11 Apply sealant in such a manner as to assure good adhesion to sides of joints and to completely fill voids in joint. Form surfaces of sealant smooth, concave, free from ridges, wrinkles, sags, air pockets and imbedded impurities.
- .12 Glazing shall be completely weathertight.

PART 3 - EXECUTION

3.1 **EXAMINATION**

- .1 Confirm that existing conditions are satisfactory before commencing installation. Check structural elements and adjoining work on which this work may depend. Verify dimensions of openings and minimum clearances. Verify that openings are level and plumb.
- .2 Advise Consultant and Owner in writing of any conditions which exist which would compromise the successful installation of aluminum windows. Commencement of installation will signify acceptance of existing conditions. No extras will be considered due to subsequent problems related to unsatisfactory conditions of openings and surfaces.

3.2 **INSTALLATION**

- .1 Provide all fastenings or anchors required for the installation.
- .2 Use only concealed fastenings.
- .3 Securely install components so that they line up square in true, straight flat and/or flush planes, plumb and level, free from distortion.
- .4 Make joints neat and fine as practicable. Allow for full expansion and contraction and take into consideration climatic conditions prevailing at time of installation.
- .5 Fasten galvanized steel supports and clips with galvanized bolts and fasten aluminum members with stainless steel screws and bolts.
- .6 Ensure that corner joints of frames are weathertight.
- .7 Fill all voids between windows and rough opening with expanding foam insulating sealant.
- .8 Remove masking tape, soils and sealant which may have been deposited on surfaces near joints.
- .9 Seal all window frames to adjacent materials both sides after filling all voids with expanding foam insulation, using silicone sealant as specified above.

SECTION 08 51 13 - ALUMINUM WINDOWS

- .10 Install metal sills straight and plumb, with uniform drainage away from building. Use maximum lengths possible. Secure sills in place with anchoring devices located at ends and at 600mm o.c.
- .11 Install drip deflectors at window sills tight to face of masonry, with self tapping stainless steel screws. File all sharp edges to smooth, rounded finish.
- .12 Install metal covers at posts at corner windows, complete with vapour retarder, insulation and fasteners. Refer to details on drawings.
- .13 Provide 25 x 25mm aluminum angle trim at perimeter of windows on interior.
 - .1 Install 3M air/vapour barrier tape behind and below angle trim, adhering to window frame and to vapour retarder on window surround.
- .14 Install teleflex operators for high window vents not scheduled to receive power operators. Run raceways across underside of windows and straight down wall to available location and mount operator 1100mm above floor level. Run raceways behind radiators.
- .15 Install power operators for all awning vents in Cafeteria. Coordinate with electrician installing power to ceiling locations and Wiremold raceways. Install wiring in raceways running straight down from ceiling at side of windows and along bottom of windows to operators. Provide keyed switches, grouped together in location acceptable to the Consultant and Owner, mounted at 1100mm above floor level.

3.3 CLEANING AND PROTECTION

- .1 After installation, remove all sealants and other misplaced materials from all surfaces, including adjacent work.
- .2 Thoroughly clean window frames, casings, and glass using materials and methods recommended by the window and glass manufacturer.
- .3 Protect installed products until completion of project.
- .4 Touch-up, repair or replace any damaged products before Consultant's review for Substantial Performance.
- .5 Immediately prior to building occupancy, when directed, inspect work and remove protective wrappings, coatings and devices and clean glass and aluminum surfaces. Use methods which will not scratch or damage glass, paint or coatings.
- .6 Perform final cleaning as per Section 01 74 00.

3.4 **DEMONSTRATION AND TRAINING**

- .1 Train Owner's staff in the operation and maintenance of the power window operating system.
- .2 Provide keys to Custodian and obtain signed receipt.

END OF SECTION

SECTION 08 81 00 - GLAZING

PART 1 - GENERAL

1.1 **RELATED WORK SPECIFIED ELSEWHERE**

- .1 Joint Sealants Section 07 92 00
- .2 Glazed Aluminum Curtain Wall Section 08 44 13
- .3 Aluminum Windows Section 08 51 13

1.2 **REFERENCES**

- .1 Canadian General Standards Board (CGSB):
 - .1 CAN/CGSB-12.1 Safety Glazing
 - .2 CAN/CGSB-12.3 Flat, Clear Float Glass
 - .3 CAN/CGSB-12.8 Insulating Glass Units
 - .4 CAN/CGSB-12.9 Spandrel Glass
 - .5 CAN/CGSB-12.20 Structural Design of Glass for Buildings
- .2 Underwriter's Laboratory Canada (ULC)
 - .1 CAN4-S104 Standard Method for Fire Tests of Door Assemblies
 - .2 CAN4-S106 Standard Method for Fire Tests of Window and Glass Block Assemblies
 - .3 CAN/ULC-S101 Fire Endurance Tests of Building Construction and Materials
- .3 American Society for Testing and Materials (ASTM):
 - .1 ASTM E1300 Standard Practice for Determining Load Resistance of Glass in Buildings
 - .2 ASTM E2190 Insulating Glass Unit Performance and Evaluation
- .4 Glass Association of North America.
 - .1 GANA Glazing Manual
 - .2 GANA Sealant Manual

1.3 **QUALITY ASSURANCE**

- .1 Coordinate with manufacturer of fire rated doors, frames and screens to ensure that the fire glass provided for the work is an acceptable component of their tested assemblies, and can be included as part of their labelled products.
- .2 Glass in guards, and at exterior and interior glazing extending below 1070mm above floor level in stairwells and at floors above grade, shall be heat-strengthened laminated safety glass, in accordance with MMAH Supplementary Standard SB-3, Glass in Guards. The thickness of the safety glass shall be as required for the size of the glazing units required; refer to drawings for sizing of openings in windows, curtain walls, and screens.
- .3 Fabricators:
 - .1 Fabricator of insulating glazing units shall be capable of providing the IGU's as specified, in sizes required.
 - .2 It is the responsibility of the Contractor to confirm that the window subcontractor has confirmed the ability of the fabricator to provide the specified units at the time of tender.
 - .3 Oldcastle Building Envelope, Prelco Inc., Saand, and Truelite are approved fabricators.

SECTION 08 81 00 - GLAZING

.4 Performance for exterior glazed assemblies shall be as specified for curtain wall in Section 08 44 13 and for windows in Section 08 51 13.

1.4 **SUBMITTALS**

- .1 Submit manufacturer's product data for double glazed insulating units. Include performance data for each type of unit required.
- .2 Submit manufacturer's product data sheets for fire rated glass.
- .3 Submit colour charts for ceramic frit for spandrel panels, for preliminary colour selections.

.4 Samples:

- .1 Submit sample of standard double glazed unit.
- .2 Submit duplicate samples of coloured spandrel glass for selection of final colours by the Consultant. Samples of up to three different shades of colour will be required, based on each colour requested by the Consultant.
 - .1 Submit duplicate samples of final colour selected

1.5 WARRANTY

- .1 Warranty all glass to be free from defects in workmanship and materials of any kind for a period of **ten (10) years**.
- .2 Warranty all fire rated glass to be free from defects in workmanship and materials of any kind for a period of **five (5) years**.
- .3 Replace (including removal and installation) all glass found to be defective.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Tempered Glass: clear tempered glass conforming to CAN/CGSB 12.1; 6mm thick unless otherwise specified
- .2 Laminated Glass:
 - .1 Clear laminated glass conforming to CAN/CGSB 12.1.
 - .2 Minimum 3 mm annealed glass, 0.76mm PVB lamination, 3 mm annealed glass.
 - .3 Provide thicker laminated glass where required to suit oversized glazing units.
- .3 Heat-strengthened Laminated Glass (Saftey Glass):
 - .1 Minimum 3 mm heat-strengthened glass, 1.5mm PVB lamination, 3 mm heatstrengthened glass, conforming to CAN/CGSB 12.1.
 - .2 Provide thicker heat-strengthened laminated glass where required to suit larger glazing units.
 - .3 Prel-Lam by Prelco, or equivalent by one of the approved fabricators listed above.

SECTION 08 81 00 - GLAZING

- .4 Double-Glazed Insulating Units:
 - .1 Conform to CAN/CGSB 12.8, Low E units.
 - .2 Framed glazing with Insulating glass units shall conform to the performance requirements of MMAH Supplementary Standard SB-10 for the climate zone; refer also to Sections 08 44 13 and 08 51 13.
 - .3 All exterior glazing shall consist of hermetically sealed units composed of 6mm Low E clear outer pane, 13mm argon gas filled (min. 90%) space, 6mm clear inner pane.
 - .1 Glazing units to be Vitro Solarban 60, Guardian SN 68, Cardinal LoE2-272, or AGC Energy Select 40; Clear, solar control, Low E (soft/sputtered coat) exterior pane.
 - .2 Outer pane shall be clear laminated glass except where noted otherwise.
 - .3 Inner pane shall be clear, laminated glass except where noted otherwise.
- .5 Spandrel Glass:
 - .1 Conforming to CAN/CGSB-12.9, 6mm thick tempered glass with ceramic frit, safety film backed.
 - .2 Ceramic frit coating shall be Prel-Coat by Prelco, or approved equal.
 - .3 Confirm colour with Consultant; for pricing purposes, assume colour will be Solar Grey PC-9901.
 - .4 Order all spandrel glass required for the entire project at one time, to ensure colour consistency.
- .6 Glazing accessories:
 - .1 Setting Blocks: Neoprene, 80 durometer hardness, 102mm x 6mm width to suit glass, to extend from the fixed stop to the opposite face of the glazing.
 - .2 Spacer Blocks: Neoprene, thickness to provide a minimum glass to face clearance of 3mm.
 - .3 Glazing Compounds:
 - .1 Tapes: Pre-formed polyisobutylene- butyl glazing tape with integral shim strip, 10-15 durometer hardness, paper release, black; Tremco "Polyshim" or equal by Dow Corning or General Electric.
 - .2 Gasket: Black neoprene "U" cavity type with lock strip.
 - .3 Sealant: One component silicone; Spectrum 2 by Tremco or Dow Corning 795, or SCS2000 SilPruf by General Electric.
 - .4 For fire protection rated applications, all glazing accessories at fire rated glass shall be as specified in the cUL or ULC tested assemblies for the specific glass type.

PART 3 - EXECUTION

3.1 **PREPARATION**

- .1 Examine framing, with glazier present, for compliance with the following:
 - .1 Manufacturing and installation tolerances, including size, squareness, offsets at corners.
 - .2 Minimum required face or edge clearances.
 - .3 Edge damage or face imperfections.
- .2 Do not proceed with glazing until unsatisfactory conditions have been corrected.

SECTION 08 81 00 - GLAZING

.3 Clean frames immediately before glazing. Remove any coatings not firmly bonded to substrates.

3.2 SITE CUTTING OF GLASS

.1 Site cutting of glass is prohibited except with the express permission of the Consultant after review of the Contractor's proposed methods.

3.3 **INSTALLATION**

- .1 Conform to the recommendations of the Glass Association of North America (GANA) Glazing Manual, most recent edition.
- .2 Inspect glass as installation proceeds. Discard any glass edge damage that could affect performance. Discard any glass with visible defects.
- .3 Protect edges of glass from damage during handling and installation.
- .4 Cut patterned glass so that pattern is parallel.
- .5 Set lights on setting blocks placed at quarter points. Glaze lights with glazing tape or dry gasket glazing system, channel shape to wrap completely around glass edge, or other approved means to prevent rattle.
- .6 Replace loose stops in their original positions, set all screws tight, countersink all nails.

3.4 EXTERIOR GLAZING (WET/DRY METHOD)

- .1 All exterior glazing shall be sealed units as specified in 2.1, above.
- .2 Provide heat strengthened, laminated safety glass in interior pane of all IGU's in:
 - .1 glazing extending below 1070mm above finished floor at landings in stairwells and at second floor level.
- .3 Apply glazing tape to fixed leg of frame accurately, cutting and butting joints at corners.
- .4 Run a heal bead of sealant 100mm up and 100mm along frame at corners of glass rebate, thick enough to make contact with glass, lapping tape and frame to ensure weathertight seal.
- .5 Apply setting blocks at 1/4 points and not less than 150mm from edges of glass. Remove protective paper cover from tape immediately before placing glass. Set glass in on setting blocks and press firmly in place against the glazing tape. Apply spacer shims to edges of glass maximum 600mm apart and more than 150mm from corners.
- .6 Install backer rod in voids below glass edge and apply continuous interior heel bead of sealant, making contact with glass edge and metal frame.
- .7 Install interior stop, with spacer strips or gasket between glazing and stops, 6mm below site line.

SECTION 08 81 00 - GLAZING

.8 Apply sealant to fill void between glass and stops, finishing in a neat, smooth, even line, bevelled approximately 1.5mm onto glass.

3.5 CLEANING

- .1 As work progresses clean all glass, including fittings. Remove all setting and glazing compounds from adjacent surfaces. Remove all finger and hand prints and other soil.
- .2 Protect glass from contact with contaminating substances during construction.
- .3 Clean and wash glass by methods recommended by glass manufacturers.
- .4 All glass shall be cleaned immediately prior to re-occupancy of the building area by the Owner and immediately prior the Consultant's review for Substantial Performance.

END OF SECTION

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 All drywall and framing work for repairs, alterations, and new work indicated on drawings and as required to facilitate the Work of this Contract.
- .2 Repairs to existing soffits affected by the Work, including stucco finish where required to match existing.
- .3 All exterior sheathing and framing work as indicated on drawings. Refer also to Section 02 40 00 for exterior wall alterations.
- .4 Coordinate the work specified herein with work specified in Section 02 40 00. Division of the Work is the Contractor's responsibility.

1.2 **RELATED WORK SPECIFIED ELSEWHERE**

.1	Demolition and Alterations	Section 02 40 00
.2	Insulation, air/vapour barrier	Section 02 40 00
.3	Painting	Section 09 92 00

1.3 **REFERENCES**

.1 ASTM International

.1 ASTIM C1390 Standard Specification for Gypsull board	.1	ASTM C1396	Standard Specification fo	r Gypsum Boar
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- .2 ASTM C840
 .3 ASTM C1629
 Standard Specification for Application and Finishing of Gypsum board
 Standard Classification for Abuse-Resistant Nondecorated Interior
 Gypsum Panel Products and Fibre-Reinforced Cement Panels
- .2 CAN/ULC-S101 Standard Methods of Fire Endurance Tests of Building Construction and Materials
- .3 Gypsum Association
 - .1 GA-214 Recommended Levels of Gypsum Board Finish .2 GA-216 Application and Finishing of Gypsum Panel Products
- .4 The Gypsum Construction Handbook CGC Inc.

1.4 **DELIVERY AND STORAGE**

- .1 Handle and store materials carefully to prevent damage. Materials must be delivered to site in their original, unopened packages.
- .2 Obtain approval of proposed locations for stockpiling material. Materials must be stored in an enclosed shelter providing protection from exposure to the elements. Provide any necessary temporary covers, skids and the like.
- .3 Store all panels flat.

DIVISION 09 - FINISHES

SECTION 09 29 00 - GYPSUM BOARD

- .4 Do not install damaged or deteriorated material but remove from Site.
- .5 Materials as delivered shall bear manufacturer's name, brand name of material and where applicable, ULC designation.

1.5 **ENVIRONMENTAL CONDITIONS**

- .1 Do not apply gypsum board or joint filler to surfaces that are damp or contain frost.
- .2 During gypsum panel application and joint finishing, temperatures within work areas shall be within the range 12°C. to 25°C.
- .3 Provide adequate ventilation to carry off excess moisture.

1.6 **RELATIONS WITH OTHER TRADES**

- .1 Co-ordinate with forces installing new aluminum windows, curtain wall and doors, and new hollow metal doors and frames.
- .2 Co-ordinate with forces installing insulation and vapour barrier in exterior soffits.

PART 2 - PRODUCTS

2.1 **MATERIALS**

- .1 All materials to conform to ASTM C1396 unless specified otherwise. Except where noted otherwise, products listed herein are produced by Canadian Gypsum Company (CGC). Equivalent products from Georgia Pacific (GP) and Certainteed will be accepted, subject to acceptance of equivalency by the Consultant.
- .2 Gypsum panels:
 - .1 Typical panels to be 16mm thick abuse resistant and mould resistant, to ASTM C1629.
 - .2 CGC Sheetrock Mold Tough Abuse Resistant Firecode Core gypsum panels, GP ToughRock Fireguard X Mold-Guard Abuse Resistant gypsum board, or CertainTeed Extreme Abuse Resistant Drywall with M2Tech.
 - .3 Where existing panels are only 13mm thick, use 13mm thick mould resistant panels; CGC Sheetrock Mold Tough or GP ToughRock Mold-Guard, or M2Tech Moisture & Mold Resistant Drywall.
- .3 Rated Gypsum panels:
 - .1 to ASTM C1629. Abuse resistant, mould resistant, Type X-Fire Rated
 - .2 CGC Sheetrock Mold Tough Abuse Resistant Firecode Core gypsum panels, GP ToughRock Fireguard X Mold-Guard Abuse-Resistant gypsum board, or or CertainTeed Extreme Abuse Resistant Drywall with M2Tech Type X.
- .3Minimum thickness to be 16mm.
 - .4 Fibreglass Mat panels:
 - .1 For exterior gypsum panel soffits, repair or replace with fibreglass mat panels.
 - .2 CGC Sheetrock Brand Glass-mat Panels Mold Tough or GP DensArmor Plus Abuse Resistant panel; 16mm thick.

- .5 Cement board: CGC Durock Cement Board Next Gen
- .6 Exterior Sheathing: 16 mm, Type X, CGC "Securock" glass-mat exterior sheathing, DensGlass by Georgia Pacific, or GlasRoc Sheathing by CertainTeed Gypsum Canada Inc.
- .7 Metal Framing:
 - .1 Metal framing shall be as manufactured by Bailey Metal Products, as specified below. Equivalent products, where available, will be accepted from Steelform Group, Imperial Group, DCM Metal, or Trebor Building Products.
 - .2 Metal framing shall conform to ASTM C645.
 - .3 Bailey Platinum Plus steel framing, minimum 0.455mm (25 ga), is the minimum required for framing.
- .8 Cold Rolled Carrying Channel: 38mm x 15mm zinc coated channel weighing min 0.707 kg/m.
- .9 Corner Bead and Casing Bead: 28 ga. galvanized steel with perforated flanges; one piece per location.
- .10 Control Joint: CGC No. 093.
- .11 Hanger wire: minimum 3.77mm (9ga) galvanized steel wire.
- .12 Tie Wire: minimum 1.5mm (16 ga) galvanized soft annealed steel.
- .13 Screws: CGC Brand Screws (or approved equal) of type recommended by the board manufacturer.
- .14 Thermal Break: Permanent adhesive faced rubberized cork, 3 mm thick by width of stud on channel to be used between masonry in exterior wall and metal furring channels.
- .15 Joint Treatment Material:
 - .1 Joint compound, topping compound, laminating compound; to ASTM C474 and C475.
 - .2 Use material recommended by board and tape manufacturer for the proposed use.
 - .3 CGC/Synko Setting-Type joint compound, for use with CGC joint tape.
- .16 Reinforcing Tape:
 - .1 Paper or fibreglass mesh tape, as recommended by the panel manufacturer for the panel type.
- .17 Finish materials
 - .1 use level 5 finisher; CGC Sheetrock Tuff-HideT Primer-Surfacer.
- .18 Insulation:
 - .1 Insulation in metal framing at exterior walls to be Rockwool International "Comfort Batt", Johns Manville "TempControl", or Owens Corning "Thermafiber UltraBatt", friction fit stone wool batts.
 - .2 Provide thicknesses sized to match the depth of the steel studs.

DIVISION 09 - FINISHES

SECTION 09 29 00 - GYPSUM BOARD

- .19 Vapour Barrier: As specified in Section 02 40 00, peel and stick vapour retarder.
 - .1 Where self adhering vapour retarder is unsuitable for the application, use minimum 10 mil polyethylene sheet, conforming to CAN/CGSB-51.34.
- .20 Air Barrier: As specified in Section 02 40 00, peel and stick vapour-permeable air barrier membrane.
- .21 Ceiling Anchors: Self drilling tie wire anchors, Phillips "Red Head" T-32 or approved equal.
- .22 Acrylic Stucco Finish:
 - .1 Direct applied acrylic stucco system consisting of base coat, reinforcing mesh, primer and finish coat; DuRock DEFS exterior finish system by DuRock Alfacing International Ltd., or Durex Stucco Lite Stucco System by Durabond Products Limited. All products shall be from one manufacturer.
 - .2 Colours and patterns shall match existing.

PART 3 - EXECUTION

3.1 GENERAL

- .1 Provide plumb, straight, level, rigid, and secure installation. Failing to achieve this result shall be cause for rejection and reinstallation of this work.
- .2 Conform to The Gypsum Construction Handbook, ASTM C840, and these specifications. The most stringent requirements shall apply.

3.2 METAL FRAMING

- .1 Conform to the guidelines for metal framing contained in The Gypsum Construction Handbook, CSA A82.31.
- .2 Install as required for proper and complete application of gypsum board products and accessories.
- .3 Do not regard grillage system indicated on drawings for ceilings as exact or complete.
- .4 Drywall shall not be fixed directly to open web steel joists and the like. Provide cross furring as specified.
- .5 Drywall panels at bulkheads shall be as specified for walls.
- .6 Where studs are installed directly against exterior walls, install rubberized cork strip between studs and wall boards to provide thermal break.
- .7 Fill metal framing with batt insulation.
- .8 Apply vapour barrier over insulation, adhering to studs and existing vapour barriers.

3.3 APPLICATION OF GYPSUM BOARD

- .1 Do not apply gypsum board until bucks, anchors, blocking, electrical and mechanical work are approved.
- .2 At exterior walls, ensure thermal separation is installed on steel studs before applying wall board.
- .3 Apply all gypsum board parallel to framing. Position all ends over studs. Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together.
- .4 Stagger joints on opposite sides of partition.
- .5 Apply single, double or triple layers of gypsum board to metal furring as indicated using screw fasteners.
- .6 Maximum screw spacing for single-ply gypsum board and face ply of 2-ply gypsum board to be 300mm o.c.
- .7 Maximum spacing of screws for base-ply of 2-ply gypsum board over steel framing to be 300mm o.c. along edges of the gypsum board and 600mm o.c. into stud or furring channel in the field of the gypsum board.

3.4 CONSTRUCTION OF FIRE RATED PARTITIONS

- .1 Where fire rated construction is required, the thickness and number of layers of board shall be governed by rating required and material used in approved assemblies.
- .2 Provide 1 hour rated beam enclosures, where required, to ULC design.

3.5 CONSTRUCTION OF SUSPENDED AND FURRED CEILINGS

- .1 Apply gypsum panels of maximum practical length with long dimension at right angles to drywall furring channels. Position end joints over furring channel web and staggered in adjacent rows.
- .2 Closely fit together, ends and edges but not forced together.
- .3 Fasten panels to drywall furring channels with screws spaced a maximum of 300mm o.c. in field of panels and along abutting ends and edges.
- .4 Provide control joints in ceilings as noted but maximum 7500 mm o.c. each way or at change in direction.
- .5 Provide framing and drywall finish in stairwells, where required to enclose underside of stairs and landings.
- .6 Where noted on plans, provide bulkheads with steel framing and drywall finish.

3.6 WALL FURRING

- .1 Apply gypsum panels parallel to framing. Position all edges over drywall furring channels with joints staggered in successive courses.
- .2 Use maximum practical lengths to minimize end joints. Fit ends and edges closely, but not forced together.
- .3 Fasten panels to channels with screws spaced a maximum 300mm oc.

3.7 APPLICATION OF ACCESSORIES

- .1 Erect accessories straight, plumb or level, rigid and at proper plane. Use full length pieces where practical. Joints shall be made tight, accurately aligned and rigidly secured.
- .2 Reinforce all vertical and horizontal exterior corners with cornerbead fastened with screws 200mm O.C. on both flanges along entire length of bead.
- .3 Where assembly terminates against masonry or other dissimilar material, apply ledge trim over panel edge and fasten with screws or staples spaced 300 mm. oc.
- .4 Power drive screws at least 9mm. from edges or ends of panel to provide uniform dimple 0.8mm deep.

3.8 TAPING AND FILLING

- .1 Finish in accordance with GA-214, as follows:
 - .1 Exposed gypsum board to Level 5 finish, suitable for finish painting with semi-glass and gloss coatings. Use full skim coat of joint compound over entire surface to achieve smooth and uniform appearance.
 - .2 Concealed gypsum board to minimum Level 1 finish. Where a fire-resistance rating is required, finishing level must conform to ULC rated assembly design.
- .2 Finish face panel joints and internal angles with joint system consisting of self-adhering crossfibre fibreglass joint tape and joint compound installed according to manufacturer's directions and feathered out into panel faces. Note: If self-adhering joint tape is not used, taping compound will be required.
- .3 Be sure drywall surface is dry and clean.
- .4 Centre and apply drywall tape directly over joint, pressing firmly to ensure even adherence to surface. Eliminate wrinkles by pressing entire length of tape with drywall knife. Avoid overlapping tape at intersections. Cut tape with drywall knife.
- .5 Cover taped joint with a layer of setting-type joint compound, forcing compound through the tape with a drywall knife or trowel to completely fill and level the joint. Allow joint to dry, and sand lightly. Apply second coat of setting-type or drying-type joint compound, feathering approximately 50mm beyond first coat. Let dry and sand lightly as required.

- .6 To finish inside corners, bend tape with to form a "U" shape. Apply tape along one side only. Press tape into corner for approximately 30mm, then apply the other side. Work downward, alternating sides in this manner until tape is pressed firmly in place. Apply setting-type joint compound as specified above, first on one side for the length of the corner and then repeating the process on the second side.
- .7 Finish fastener heads, corner bead and trim as required with two to three coats of joint compound, feathered out onto panel faces and sanded to a smooth surface.
- .8 Provide skim coat over entire face of boards to ensure smooth surface for painting.
- .9 Fill screw head depressions to bring flush with adjacent surface of gypsum board so as to be invisible after painting is completed.
- .10 Sand dried taping compound lightly to remove burred edges and other imperfections. Avoid sanding adjacent surface of board.
- .11 Completed installation to be smooth, level or plumb, free from waves and other defects and ready for painting.
- .12 Painting shall be done in accordance with Section 09 92 00.

3.9 **EXTERIOR SOFFITS**

- .1 Where repairs are required to exterior soffits after replacement of windows and doors, frame with 20 ga steel stud frames, anchored and braced to masonry walls and/or floor slabs.
- .2 Apply soffit board to metal furring channels at 610mm o.c. with 25mm Hi-Lo screws, type S.
 - .1 At stucco soffits supply and install 1 layer of 16mm cement board.
 - .2 At gypsum board soffits, use fibreglass mat panels.
- .3 At stucco soffits, provide acrylic stucco finish in colour and texture to match existing.

END OF SECTION

PART 1 - GENERAL

1.1 **RELATED WORK SPECIFIED ELSEWHERE**

.1Demolition and AlterationsSection 02 40 00.2Gypsum BoardSection 09 29 00

1.2 SCOPE OF WORK

- .1 This Section is intended to cover all repainting of existing surfaces and painting of new surfaces in areas affected by the Work of this Contract, both interior and exterior. With the exception of painting specifically called for in other Sections of the Specifications, all painting work is included in the scope of this Section of the Specification.
- .2 Unless otherwise noted on drawings, paint colours are to match existing colours in each area.
- .3 The intent of this Specification is that all new work and existing surfaces affected by the Work of this project shall be painted.
- .4 Paint all new, altered, and repaired surfaces in accordance with the paint systems specified. The rest of the affected wall, to the corners at adjacent walls, are to be cleaned, prepared, and repainted. Scope of painting work includes the following:
 - .1 interior masonry at heads, jambs, and sills of new windows, after repairs have been made;
 - .2 visible portions of steel lintels at new windows.
 - .3 new and repaired drywall surfaces;
 - .4 any painted surfaces damaged during the Work of this Contract, after being repaired;
 - .5 new wall mounted electrical raceways, painted to match wall colours
 - .6 one coat for entire wall where windows are replaced.
 - .7 All paint colours to match existing.
- .5 Work includes:
 - .1 testing of substrates for moisture and alkalinity
 - .2 surface preparation of substrates as required for acceptance of paint, including sanding, cleaning, small crack repair, patching, caulking, and making good surfaces
 - .3 recoatability testing
 - .4 pre-treatments, sealing, and priming of surfaces
 - .5 painting of existing and new surfaces in accordance with specified systems
 - .6 provision of adequate ventilation and safe working conditions
 - .7 clean up and protection

1.3 **REFERENCE STANDARDS**

- .1 Do painting and finishing work to material manufacturer's instructions and to the most recent edition of the Master Painters Institute (MPI) Maintenance Repainting Manual and Architectural Painting Specification Manual. The most stringent standards shall apply.
- .2 All paints and coatings used must conform to Green Seal Standard GS-11 for paints and coatings based on performance requirements and reduced use of hazardous substances and reduced volatile organic compounds.

1.4 **QUALITY ASSURANCE**

- .1 Painting Subcontractor shall have a minimum of five (5) years documented successful experience with projects of a similar type and scope. When requested to do so by the Consultant, provide references confirming satisfactory performance of work on such projects.
- .2 Painting crew shall be composed of experienced, qualified journeypersons. Apprentices may undertake work only when fully supervised by senior, qualified workers.
- .3 All painting and coating products shall be as listed in the current Approved Product List published by the Master Painter's Institute (MPI).
- .4 Materials, surface preparation and workmanship shall conform to the latest edition of the MPI Maintenance Repainting Manual and Architectural Painting Specifications Manual.
- .5 The Painting Subcontractor shall inspect all surfaces requiring repainting and shall notify the Consultant and Contractor, in writing, of any defects or problems, prior to commencing repainting or after preparation work. Commencement of work will infer acceptance of existing conditions.
- .6 Final coat shall be uniform in colour and sheen across the entire surface area.

1.5 SCHEDULING OF WORK

- .1 Submit a schedule for all painting work to be performed in occupied areas. Scheduling must be coordinated with the School Principal. Schedule must be submitted at least two weeks prior to proposed commencement of painting work and is subject to approval by the Owner.
- .2 Painting work in occupied areas must be undertaken when the area is scheduled to be vacant for a sufficient period to fully perform the work, including protection of room contents, preparation of surfaces, all painting, provision of adequate curing times, and clean up.
- .3 Advise Owner of any items that need to be removed to facilitate painting work. Wall mounted tack boards, writing boards, casework, etc., do not have to be removed for painting.
- .4 Paint occupied areas in strict accordance with the approved schedule. Changes to the schedule will require written authorization from the Principal.

1.6 WORK ENVIRONMENT

- .1 Do not apply paint finish in areas where dust is being generated. Apply paint only to dry, clean, properly cured and adequately prepared surfaces.
- .2 Maintain environmental conditions within limits recommended by manufacturer, for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.
 - .1 Do not perform painting or decorating work when the ambient air and substrate temperatures are below 10°C, for both interior and exterior work.

- .2 Maintain minimum ambient air and substrate temperatures for 24 hours before, during and after paint application.
- .3 Provide adequate, continuous ventilation during work.
- .4 Provide supplemental ventilating equipment if ventilation from existing system is inadequate to meet minimum requirements.
- .5 Do not perform painting work when the relative humidity is above 85% or when the dew point is less than 3°C variance between the air/surface temperature.
- .6 Test concrete, masonry, plaster, and wood surfaces for moisture and alkalinity.
 - .1 Do not do painting or decorating work when the maximum moisture content of the substrate exceeds 15% for wood, or 12% for concrete, masonry, plaster, and gypsum board.
- .3 Work areas shall be well illuminated during painting work. Do not perform work unless a minimum lighting level of 323 Lux (30 foot candles) is provided on surfaces to be painted or repainted.
- .4 Conform to requirements of MPI Maintenance Repainting Manual and Architectural Specification Manual.

1.7 **INSPECTION AND ACCEPTANCE OF EXISTING CONDITIONS**

- .1 Submit written confirmation of acceptance of existing conditions, to the Consultant, prior to commencing painting work. Painting may not commence without submission of this confirmation.
- .2 Examine the conditions of existing surfaces to be repainted and evaluate with respect to MPI's Maintenance Repainting Manual. This includes the following:
 - .1 check thickness and adhesion of existing coatings. Perform adhesion tests on existing surfaces where existing coatings are peeling, flaking, or showing signs of delamination.
 - .2 determine what type of paint products were used previously
 - .3 assess defects in existing coatings
 - .4 Determine the degree of surface degradation. Refer to MPI guidelines for accessing levels of surface degradation.
- .3 Notify the Consultant, in writing, immediately if any existing condition is encountered that will prevent the attainment of satisfactory results in this work.
- .4 Existing paint materials used in the building may not be compatible with new materials specified for the surface types in some cases. This includes surfaces which may be coated with alkyd paints. Additionally, encapsulation of old lead paint may be required. Review hazardous materials report to determine if any lead based paint is known to be present in the building.

1.8 **SUBMITTALS**

.1 Submit a list of all paint materials for review by Consultant, prior to ordering materials.

- .2 Submit manufacturer's data sheets for each paint product to be used on the project, including:
 - .1 MPI approved product number
 - .2 Product characteristics
 - .3 Surface preparation instructions and recommendations
 - .4 Primer requirements and finish specifications
 - .5 Storage and handling recommendations
 - .6 Application methods
 - .7 Cautions
 - .8 VOC data
- .3 Submit WHMIS Material Safety Data Sheets (MSDS) for all paint/coating materials.
- .4 Submit list of all paint brand names and colour formulas used on the job. This can be a sheet containing copies of the labels added to the paint containers at time of purchase.
- .5 Submit written confirmation of acceptance of existing conditions, as specified above, or an assessment of existing conditions noting all problematic areas.
- .6 Submit a receipt for maintenance materials required to be provided to Owner; receipt to be signed by building Custodian.

1.9 STORAGE AND HANDLING

- .1 Store paint and painter's materials in clean, dry, well ventilated locations approved by the Consultant. Store materials in an area that is within the acceptable temperature range, per manufacturer's instructions. Protect from freezing.
- .2 All paint shall be in unopened containers, labelled with:
 - .1 manufacturer's name,
 - .2 product name, product type,
 - .3 instructions for surface preparation and product application,
 - .4 VOC content,
 - .5 compliance with applicable standards,
 - .6 batch date, and
 - .7 colour name and number.
- .3 Provide CO_2 fire extinguisher minimum 9 kg capacity in paint storage area.
- .4 Handle, store, use and dispose of flammable and combustible materials in accordance with the Ontario Fire Code and to requirements of Authorities Having Jurisdiction.
- .5 Do not permit contaminants to enter waterways, sanitary or storm drain systems, or into ground. Adhere to the following procedures:
 - .1 Retain cleaning water for water-based materials to allow sediments to be filtered out. In no case shall equipment be cleaned using free draining water.
 - .2 Retain cleaners, thinners, solvents and excess paint and place in designated containers and ensure proper disposal.
 - .3 Return solvent and oil soaked rags used during painting operations for contaminant recovery, proper disposal, or appropriate cleaning and laundering.
 - .4 Close and seal tightly partly used cans of materials including sealant and adhesive containers and store protected in well ventilated fire-safe area at moderate temperature.

.6 Dispose of materials in accordance with the requirements of authorities having jurisdiction. Where paint recycling is available, collect waste paint by type and provide for delivery to recycling or collection facility. Empty paint cans are to be dry prior to disposal or recycling.

1.10 **SIGNS**

- .1 Provide legible signs throughout the Work reading "WET PAINT" in prominent positions during painting and while paint is drying.
- .2 Use 75mm high letters on white card or board.

1.11 TEMPORARY COVERS AND PROTECTION

- .1 Protect floors and other surfaces with temporary covers such as dust sheets, polyethelene film or tarpaulins.
- .2 Remove light switches and electrical communication and outlet plates and reinstall on completion of paint application..
- .3 Keep oily rags, waste and other similar combustible materials in closed metal containers; take every precaution to avoid spontaneous combustion, remove waste and combustible materials daily.
- .4 Clean surfaces soiled by spillage of paint, paint spattering and the like. If such cleaning operations damage the surface, repair and replace damaged work at no cost to the Owner.

1.12 **RETOUCHING**

.1 Do all retouching, etc. to ensure that the building may be handed over to the Owner in perfect condition, free of spatter, finger prints, rust, watermarks, scratches, blemishes of other disfiguration.

1.13 MAINTENANCE MATERIALS

- .1 Provide one sealed can, one litre capacity, of each product in each colour used in the Work for Owner's use in maintenance Work.
- .2 Container to be new fully labelled with manufacturer's name, type of paint, and colour.
- .3 Store materials where directed by Owner's representative on site. Obtain receipt, signed by building custodian and listing all maintenance materials provided, and submit to Consultant.

1.14 WARRANTY

- .1 Warrant painting work for a period of **two (2) years** from date of Substantial Performance, or from date of completion of Work if work is not complete at date of Substantial Performance.
- .2 Subcontractor shall warrant that the work has been performed in accordance with the standards and requirements of the MPI Maintenance Repainting Manual and Architectural Painting Specification Manual, most recent editions.

PART 2 - PRODUCTS

2.1 **MATERIALS**

- .1 Paint and finishing materials shall be the highest grade, first line quality, low VOC products, included on the MPI Approved Product List under the MPI reference numbers specified herein, and the products of the following manufacturers:
 - .1 Benjamin Moore & Co.
 - .2 Devoe High Performance Coatings
 - .3 Dulux Paints
 - .4 The Sherwin-Williams Company
 - .5 General Paints
 - .6 Sico Paints
 - .7 PPG Canada
 - .8 Para Paints
- .2 Paints, enamels, fillers, primers, varnishes and stains shall be ready mixed products of one of the manufacturers listed. Substitutes will not be allowed. The only exception to this is where a specific product of another manufacturer is specified herein; such products shall be provided as specified.
- .3 All paints shall be ready-mixed and pre-tinted. Thoroughly re-mix all paint in containers prior to and during application to ensure break-up of lumps and uniformity of colour and gloss.
- .4 Thinners, cleaners type and brand recommended by the paint manufacturer
- .5 Only products manufactured by paint manufacturer stated at time of submission of samples will be allowed on Site unless other materials specifically specified herein or otherwise approved. No painting to be performed until paint manufacturer is identified and acceptance received from the Consultant.
- .6 Where available, paint products shall meet MPI Environmentally Friendly E3 ratings for VOC content.
- .7 All materials and paints shall be free of lead and mercury, shall conform to Canadian Regulations for VOC limits, and shall meet flame spread and smoke developed limits required by code.
- .8 Deliver materials to Site in original unbroken containers bearing brand and maker's name. The presence of any unauthorized material or containers for such, on Site shall be of sufficient cause for rejection of ALL paint materials on Site at that time, and all previous painted work repainted with proper material.

PART 3 - EXECUTION

3.1 **PREPARATION - GENERAL**

- .1 Remove existing hardware and surface fittings, fastenings, plates, mechanical louvers, light fixture trim, signage, etc., from walls prior to repainting and replace upon completion. Clean all items, wrap carefully, fully labelling each package, and store on site for reinstallation at completion of the work. Do not use solvent or reactive cleaning agents on items which may mar or lose finishes.
- .2 Protect all adjacent interior surfaces, equipment, and furnishings to remain in work areas, including rating and instruction labels on doors, frames, piping, etc., from repainting operations and damage by use of drop cloths, shields, masking, templates, or other suitable methods. Make good any damage caused by failure to provide adequate protection.

3.2 **PREPARATION OF SURFACES**

- .1 Prepare surfaces in accordance with the following standards and to MPI Maintenance Repainting Manual and Architectural Specification Manual; the most stringent requirements shall apply.
- .2 Existing Surfaces:
 - .1 Refer to the MPI Maintenance Repainting manual for the levels of surface degradation and the corresponding surface preparation requirements and recommended repaint systems. Prepare existing surfaces as recommended for the finish required.
 - .2 Remove all surface contamination such as oil, grease, loose paint, mill scale, dirt, foreign matter, rust, mould, mildew, mortar, efflorescence, smoke stains, sap, and sealers from existing surfaces to assure sound bonding to tightly adhering old paint.
 - .3 Scape peeling paint off existing masonry surfaces and apply a compatible masonry sealer, approved for use by the paint manufacturer, before applying new coatings.
 - .4 Glossy surfaces must be clean and dull before repainting. Wash with abrasive cleanser, or, wash thoroughly and dull by sanding. Use full coat of bonding primer below finish coats.
 - .5 Where smoke and water stains cannot be adequately removed by cleaning, provide stain blocking primer over affected areas.
 - .6 Spot prime any existing bare areas with an appropriate primer.
- .3 New Surfaces:
 - .1 Prepare wood surfaces to CGSB 85-GP-IM. Use CAN/CGSB 1.126 vinyl sealer over knots and resinous areas. Use CGSB 1-GP -103M wood paste filler for nail holes. Tint filler to match.
 - .2 Prepare wallboard surfaces to CGSB 85-GP-33M. Fill minor cracks with plaster patching compound for stained woodwork.

- .3 Apply prime coat on wood scheduled for paint finish before installation.
- .4 Back prime wood scheduled for transparent finish. Do not prime surfaces scheduled for transparent finish.

3.3 **RECOATABILITY TESTING**

- .1 Perform reocoatability tests at existing surfaces to be repainted as outlined below.
- .2 Check for compatibility between existing and new coatings by applying a test patch of the recommended coating system, covering at least 2 to 3 square feet. Allow surface to dry one week before testing adhesion per ASTM D3359. If the coating system is incompatible, complete removal is required.
- .3 Clean and prepare test areas of the surface to be repainted. Areas selected shall be areas of the surfaces most vulnerable to weathering and/or wearing.
- .4 Repeat the recoatability testing until satisfactory results are obtained.

3.4 **FINISHING SYSTEMS**

- .1 Finishing systems specified are to be used as applicable; some may not apply to the Work of this project.
- .2 Finishing systems specified below are based on the repainting and new painting systems included in the MPI manuals. Painting in renovated areas consists of repainting of existing surfaces and painting of new surfaces.
 - .1 RIN and REX formulas are found in the Maintenance Repainting Manual and apply to repainting work.
 - .2 INT and EXT formulas are found in the Architectural Painting Specification Manual and apply to new painting work.
 - .3 Finishing systems are to be modified where indicated below.
 - .4 Finishes must be low VOC products; use paint products meeting MPI Environmentally Friendly E3 ratings, where such products are available in Ontario.
 - .5 All finishing systems shall be Premium Grade.
- .3 Existing surfaces to be repainted are to be primed in accordance with MPI Maintenance Repainting Manual recommendations for the degree of surface degradation, as follows:
 - .1 DSD-1: Touch-up
 - .2 DSD-2: Spot prime
 - .3 DSD-3: Full prime coat
 - .4 DSD-4: After repair by others, full prime coat
- .4 Bonding Primer:
 - .1 Where existing surfaces are coated with different coating types than they are specified to receive, including old alkyd paints, glazed coatings, epoxies, etc., or where surfaces are inherently slick or glossy, use a full prime coat of bonding primer before applying new finish coats.
 - .2 Bonding primer shall be MPI #17 X-Green, or MPI #17 within VOC range E3, selected as appropriate for the substrate and new coating.

- .5 Interior Work:
 - .1 Drywall and Plaster:
 - .1 Walls: High Performance Architectural Latex, semi-gloss finish
 - .1 RIN 9.2B G5, for repainting work:
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level
 - .3 2 coats HIPAC Latex; MPI #141, VOC Range E3
 - .2 INT 9.2B G5, for new painting work:
 - .1 1 coat Latex Primer Sealer; MPI #50, VOC Range E3
 - .2 2 coats HIPAC Latex; MPI #141, VOC Range E3
 - .2 Ceilings: Latex (over latex sealer), flat finish
 - .1 RIN 9.2A G1, for repainting work:
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level
 - .3 2 coats MPI #53; VOC Range E3
 - .2 INT 9.2A G1 for new painting work:
 - .1 I coat Primer; MPI #50
 - .2 2 coats MPI #53; VOC Range E3
 - .3 All new drywall, whether requiring finish painting or not, must receive prime coat.
 - .2 Concrete Block, paint: High Performance Architectural Latex, semi-gloss finish
 - .1 RIN 4.2D G5 (modified) for repainting work
 - .1 1 coat bonding primer; MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level
 - .3 2 coats finish; MPI #141, VOC Range E3
 - .2 INT 4.2D G5 (modified) 4 coat system, for new painting work
 - .1 2 coats latex blockfiller; MPI #4
 - .2 2 coats finish; MPI #141, VOC Range E3
 - .3 Concrete Block, glaze: Epoxy-modified Latex Finish, gloss
 - .1 RIN 4.2F G6 (modified) for repainting work
 - .1 1 coat bonding primer; MPI #17 X-Green
 - .2 2 Coats epoxy-modified latex finish; MPI #115
 - .2 Provide in all hallways and washrooms, and where required to match existing.

- .4 Cast in Place Concrete
 - .1 walls: High Performance Architectural Latex, semi-gloss finish
 - .1 RIN 3.1J G5 for repainting work
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level
 - .3 2 coats HIPAC Latex finish; MPI #141, VOC Range E3
 - .2 ceilings: High Performance Architectural Latex, low sheen finish
 - .1 RIN 3.1J G2 for repainting work
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level
 - .3 2 coats HIPAC Latex finish; MPI #141, VOC Range E3
- .5 Woodwork Opaque Finish: High Performance Architectural Latex, semi-gloss finish
 - .1 RIN 6.3T for repainting work
 - .1 prime as required by DSD level; MPI #39
 - .2 2 coats HIPAC latex finish; MPI #141. VOC Range E3
 - .2 INT 6.4S for new painting work
 - .1 1 coat latex primer MPI #39
 - .2 2 coats HIPAC latex finish; MPI #141. VOC Range E3
- .6 Woodwork Polyurethane Varnish over Semi-transparent Stain, gloss
 - .1 RIN 6.3E G6 for repainting work
 - .1 stain as required by DSD level; MPI #90
 - .2 2 coats Polyurethane Varnish, clear gloss; MPI #56 (clear satin where required to match existing; MPI #57
- .7 Ferrous Metal: W.B. Light Industrial Coating, semi-gloss finish
 - .1 RIN 5.1P- G5 for repainting work
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level; MPI #101
 - .3 2 coats W.B. light industrial coating; MPI #153
 - .2 INT 5.1N G5 for new painting work
 - .1 1 coat epoxy primer; MPI #101
 - .2 2 coats W.B. light industrial coating; MPI #153

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SECTION 09 92 00 - REPAINTING

- .8 Galvanized Metal: High Performance Architectural Latex, semi-gloss finish
 - .1 RIN 5.3J G5 (over anti-corrosive alkyd primer)for repainting work
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level; MPI #134
 - .3 2 coats HIPAC Latex MPI #141; VOC Range E3
 - .2 INT 5.3M -G5 for new painting work
 - .1 1 coat water based Galvanized Primer MPI #134
 - .2 2 coats HIPAC Latex MPI #141; VOC Range E3
- .9 Insulation on Pipes and Ducts (plastic):High Performance Architectural Latex, semigloss finish
 - .1 RIN 6.8A G5, for repainting work
 - .1 1 coat Bonding Primer MPI #17 X-Green
 - .2 2 coats HIPAC Latex MPI #141; VOC Range E3
 - .2 INT 6.8A G5, for new painting work
 - .1 1 coat Bonding Primer MPI #17 X-Green
 - .2 2 coats HIPAC Latex MPI #141; VOC Range E3
- .10 Mechanical Equipment:
 - .1 High Performance Architectural Latex, semi-gloss finish
 - .2 As specified for metal types.
 - .3 Use heat resistant paint where required.
- .11 Piping, Conduit & Ductwork (uncoated):High Performance Architectural Latex, semigloss finish
 - .1 RIN 5.3J G5, for repainting work
 - .1 1 coat of bonding primer MPI #17 X-Green
 - .2 2 coats of HIPAC Latex MPI #141; VOC Range E3
 - .2 INT 5.3M G5, for new painting work
 - .1 1 coat water based Galvanized Primer MPI #134
 - .2 2 coats HIPAC Latex MPI #141; VOC Range E3
- .12 Concrete Floors: Alkyd Floor Enamel, gloss
 - .1 RIN 3.2B for repainting work
 - .1 Bonding primer: MPI #17 X-Green
 - .2 Where bonding primer is not required, prime as required by DSD level; MPI #27
 - .3 2 Coats Alkyd Floor Enamel, MPI #27

- .6 Exterior Work
 - .1 Stucco, cementitious panels:High Performance Architectural Latex (over W.B. alkali-resistant primer), low sheen
 - .1 REX 9.1 K -G3, for repainting work
 - .1 Prime as required by DSD level; Alkali Resistant Acrylic Primer MPI #3
 - .2 2 Coats Latex MPI #315
 - .2 Galvanized Steel:W.B Light Industrial Coating (over cementitious primer), semi-gloss
 - .1 REX 5.3G for repainting work
 - .1 Over non-compatible coatings, 1 full coat bonding primer
 - .2 or, over compatible epoxy coatings, prime as required by DSD level; MPI #101
 - .3 2 Coats Exterior W.B Light Industrial Coating MPI #163
 - .2 EXT 5.3G for new painting work
 - .1 Touch-up welds and any repairs
 - .2 1 coat Cementitious Primer MPI #26
 - .3 2 Coats Exterior W.B Light Industrial Coating MPI #163
 - .3 Ferrous Metals, Structural Steel: W.B. Light Industrial Coating over rust inhibitive primer, semi gloss
 - .1 REX 5.1K G5, for repainting work
 - .1 Over non-compatible coatings, 1 full coat bonding primer
 - .2 or, over compatible coatings, prime as required by DSD level; MPI #107
 - .3 2 Coats Water Based Light Industrial Coating MPI #163
 - .4 Wood : Solid Colour Stain
 - .1 REX 6.2D for repainting
 - .1 Over non-compatible coatings, 1 full coat bonding primer
 - .2 or, over compatible coatings, prime as required by DSD level; MPI #5
 - .3 2 Coats Exterior Solid Colour Stain MPI #14

3.5 **APPLICATION**

- .1 Apply coatings in accordance with manufacturer's printed instructions.
- .2 Use suitable, clean equipment in good condition.
- .3 Maintain dust-free suitable conditions on the surfaces free from machine, tool or sandpaper marks, insects, grease, or any other condition liable to impair finished work to prevent production or good results.
- .4 Do not commence repainting unless substrates are acceptable and until all environmental conditions (heating, ventilation, lighting and completion of other subtrade work, if applicable) are acceptable for application of products.
- .5 Allow appropriate time between surface cleaning and commencement of painting work to permit surface conditions to be ready for coating work, and to prevent re-contamination of surfaces.

- .6 Apply primers, paints, and stains in accordance with the Premium Grade finish requirements of the MPI Painting and Repainting manuals.
- .7 Apply bonding primer over incompatible existing coatings and glossy substrates, as specified above.
- .8 Apply evenly, uniform in sheen, colour and texture, free from brush or roller marks, well brushed or rolled in and free of crawls, runs, join marks or other defects.
- .9 Sand and dust between each coat to provide an anchor for next coat and to remove defects in previous coat (runs, sags, etc.) visible from a distance up to 1000 mm.
- .10 Permit paint to dry between coats. Touch up uneven spots after applying first coat. Tint various coats of multiple coat work in light shades of the final colour selected, to distinguish between coats.
- .11 To avoid air entrapment in applied coats, apply materials in strict accordance with manufacturer's spread rates and application requirements.
- .12 Over new concrete block, two coats of block filler are required to achieve smooth and uniform surface on block.
- .13 Painting coats are intended to cover surfaces perfectly; if in painter's opinion, formula specified is inadequate to provide a first class finished surface, report to the Consultant and have formulas rectified before commencing work. Surfaces imperfectly covered shall receive additional coats at no additional cost. Provide additional coat where ever dark colours are used.
- .14 Use paint unadulterated. Use same brand of paint for primer, intermediate and finish coats. Factory mix all paints.
- .15 Paint finish shall be applied by roller except in the case of wood trim, door frames, base board and similar work of small surface area which shall be painted by brush. Do not use roller for applying finish other than paint.
- .16 Spray painting will <u>not</u> be permitted.
- .17 Finish edges of doors with paint as required to match face of door.
- .18 Carefully hand smooth and sandpaper wood between coats (including priming). Apply one coat sealer before applying first coat paint filler to knots or sap blemishes on wood surfaces to receive paint or stain finish.
- .19 After first coat, fill nail holes, splits and scratches, using putty coloured to match finish.
- .20 Remove rust, oil, grease and loose shop paint from metal work by brushing or with wire brushes. Feather out edges to make touch up patches inconspicuous.
- .21 Do not etch galvanized metal. Use zinc rich primer.

DIVISION 09 - FINISHES

SECTION 09 92 00 - REPAINTING

3.6 CLEAN-UP AND PROTECTION

- .1 Replace and reinstall all items previously removed and stored upon completion of repainting work in each area.
- .2 Protect all newly painted exterior surfaces from rain and snow, condensation, contamination, dust, salt spray and freezing temperatures until paint coatings are completely dry. Curing periods shall exceed the manufacturer's recommended minimum time requirements.
- .3 Erect barriers or screens and post signs to warn, limit or direct traffic away or around work area as required.
- .4 Remove all paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
- .5 Clean equipment and dispose of wash water and solvents as well as all other cleaning and protective materials, paints, thinners, paint removers/strippers in accordance with the environmental and safety requirements of authorities having jurisdiction.

END OF SECTION
SECTION 12 24 00 - MOTORIZED AND MANUAL WINDOW SHADES

PART 1 - GENERAL

1.1 WORK INCLUDED

- .1 A Cash Allowance is included for the supply and installation of motorized and manually operated, full height, room darkening shades at exterior windows.
- .2 Motorized window shades are required in the following areas:
 - .1 Cafeteria
 - .2 Foods Classroom
 - .3 Woodshop 121
 - .4 Photo Studio 123B
 - .5 Classroom 125
 - .6 Woodshop 127
- .3 Manual window shades are required at new windows in all other rooms, except rooms with existing roller shades indicated to be retained. Blinds are not required in corridors or stairwells.
- .4 Reference to windows includes all glazed openings, including aluminum windows and curtainwall.
- .5 Reinstall blinds and other window coverings indicated to be retained, which are removed to accommodate window work, under the general Contract.

1.2 **RELATED WORK SPECIFIED ELSEWHERE**

1	Hollow Metal Doors and Frames	Section 08 11 13
2	Glazed Aluminum Curtain Walls	Section 08 44 13
3	Aluminum Windows	Section 08 51 13
4	Electrical	Refer to drawings

1.3 SUBMITTALS

- .1 Submit shop drawings including the following information:
 - .1 Layout of all blinds on floor plans.
 - .2 Provide details to show sizes, fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
 - .3 Indicate field measurements on shop drawings.
- .2 Submit list of proposed materials.
- .3 Submit manufacturer's specifications, product data, and other data needed to prove compliance with the specified requirements.
- .4 Manufacturer's recommended installation procedures which, when accepted by the Consultant will become the basis for accepting or rejecting actual installation procedures used on the work.
- .5 Fabric to be flame retardant. Provide proof of compliance with CAN/ULC S109, Flame Tests of Flame-Resistant Fabrics and Films, small scale vertical burn requirement test.

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- .6 Submit fabric samples for colour selection by the Consultant.
- .7 Provide printed operation and maintenance instructions for inclusion in maintenance manuals.

1.4 WARRANTY

.1 Provide a warranty for an extended period of three (3) years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 **MATERIALS**

- .1 Window shades will be supplied and installed by subtrade appointed by Owner and paid through the Cash Allowance included in the Contract.
- .2 Manual shades shall be commercial system with smooth operating chain and sprocket roller shades,
- .3 Motorized shades will be roll-up opaque fabric window shades, including motor, controls, mounting hardware, and accessories. Motorized window shades shall be operated by key operated wall switches, located remotely as directed by the Consultant. Shade manufacturer shall supply the key switches for each installation and coordinate hook-up by the electrical subcontractor
- .4 Owner will provide specifications at a later date.
- .5 For blinds to be reinstalled, existing brackets and other hardware may be reused, providing they were not damaged during removal. Replace all damaged or missing blind hardware. Provide new fasteners for all blinds and other window coverings being reinstalled.

PART 3 - EXECUTION

3.1 COORDINATION

- .1 Co-ordinate as required with other trades to assure proper and adequate provision in the work of those trades interfaced with the work of this Section.
- .2 Coordinate with electrician to ensure provision of all required wiring, conduit, and raceways. All wiring shall be inside raceways where surface mounted on walls.

3.2 EXISTING CONDITIONS

.1 Examine the areas and conditions under which work of this section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

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3.3 INSTALLATION

- .1 Fasten support brackets to masonry and/or steel lintels. Fastening brackets to aluminum window or curtain wall frames will not be accepted.
- .2 Locate and install the Work of this Section in strict accordance with reviewed Shop Drawings, pertinent requirements of government agencies having jurisdiction, and the manufacturer's recommended installation procedures as accepted by the Consultant anchoring all components firmly into position for long life under School environment use.
- .3 Install the work plumb, level, and in proper operating condition.
- .4 Upon completion of the installation, put each operating component through at least five complete cycles, adjusting as required to achieve optimum operation and complete blackout at all edges.

END OF SECTION