HAMILTON-WENTWORTH DISTRICT SCHOOL BOARD
20 Education Court, P.O. Box 2558
Hamilton, ON L8N 3L1

HWDSB

curiosity • creativity • possibility

WINDOW AND DOOR REPLACEMENT TO

LAKE AVENUE ELEMENTARY SCHOOL

157 LAKE AVENUE NORTH, HAMILTON, ON

ARCHITECTURAL SPECIFICATIONS

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ARCHITECTURAL DRAWINGS .....prepared by Whiteline Architects Inc.

END OF DRAWING INDEX

ARCHITECTURAL ITEMS:

1.1 Description of Work

.1 Work under this Contract in general covers, but is not limited to, window and door replacements to Lake Avenue Elementary School for the Hamilton Wentworth District School Board.

a) The project includes removal of existing windows and doors and installing new, all in accordance with the Contract Documents.

1.2 Documents Required

.1 Maintain at job site, one copy each of following:

a) Contract drawings
b) Specifications
c) Addenda
d) Reviewed shop drawings
e) Change Orders and Contemplated Change Notices
f) Site/Field Instructions
g) Other modifications to contract
h) Field test reports
i) Copy of approved work schedule
j) Manufacturers' installation and application instructions.
k) List of Sub-contractors
l) As-built Drawings
m) Minutes of Site Meetings

1.3 Specifications

.1 Portions of Specifications are written in short form. Therefore, it shall be understood that where item of Work is stated in heading followed by material, equipment, component, or operation, words "shall be", "shall consist of" or similar words or phrases are implied which denote supply, fabricate and supply, install, provide or commission of such materials, equipment or operations for component of Work designated by heading.

.2 Whenever used in Specifications following definitions shall apply:

a) SUPPLY - Procurement or fabrication of standard components not to special design of materials, equipment, or components, or performance of services to extent indicated. Where used with respect to materials, equipment, or components, term shall include delivery to Site but is not intended to include installation of item, either temporary or final.

b) FABRICATE AND SUPPLY - Fabrication of materials, equipment or component, to special customized design to extent indicated including delivery to Site, assisting in form of supervision to those Section(s) installing materials, equipment or component. Term does not include installation of item either temporary or final.

c) INSTALL - Placement of materials, equipment, or components, including receiving, unloading, transporting, storage, uncrating and installing, and performance of such testing and finish work as is compatible with degree of installation specified complete ready for use.

d) PROVIDE - To Supply and Install, compete and in place, including accessories, finishes, tests and services as required to render item so specified complete ready for use.

e) COMMISSION - Startup and initial operation of equipment as required and/or as specified in respective Sections, to demonstrate satisfactory operation of components and entire system including calibration of any control instrumentation as required to maintain operations.

.3 Drawings, Lists or Schedules of Items are intended to show scope and arrangement of work. For location of item described refer to such Drawings, Lists or Schedules unless location stipulated in Specifications.

.4 Wherever words "acceptable", "approved", "reviewed", "satisfactory", "selected", "directed", "designated", "permitted", "inspected", "instructed", "clarification", "required", "report", "submit", "obtain", "consult", "advise", or similar words or phrases are used in Standards or in Contract Documents, it shall be understood that, unless context provides otherwise words "by/to/with/from the Architect shall follow them as applicable.

1.4 Work Schedule

.1 Scheduling of this project would be flexible if school closures extend for a period of time past the bid award that would allow the successful proponent of the project to start and complete the project prior to the next scheduled student return date. This scheduling change would also rely on being compliant with any government issued recommendations and closures at the time for COVID19. If early scheduling is not possible for any reason, the posted bid dates would apply. Prior to commencing the project, the contractor must provide confirmation of delivery of all materials required to complete the work or portion of the project and make the school safe and suitable for regular school operations.

No work shall commence on the project or portion of the project without assurance that the delivery of critical materials to complete the project is in place.

It is the expectation of the Hamilton Wentworth District School Board (HWDSB) that the Contractor will order the necessary materials upon award of the Contract.

If the Contractor is delayed in the performance of the Work by:
any cause beyond the Contractors control other than one resulting from a default or breach of Contract by the Contractor, then the Contract Time shall be extended for such reasonable time as the Consultant may recommend in consultation with the Contractor. The extension of time shall not be less than the time lost as the result of the event causing the delay, unless the Contractor agrees to a shorter extension. The Contractor shall not be entitled to payment for costs incurred by such delays unless such delays result from actions by the Owner, Consultant or anyone employed or engaged by them directly or indirectly.

.2 Provide within 14 working days after Contract award, schedule showing anticipated progress stages and final completion of work within time period stated on the Tender Form.

.3 In accordance with schedule and in form acceptable to the Architect provide within (14) working days after contract award, schedule showing dates for:
a) Submission of shop drawings, material lists, and samples.
b) Delivery of the following items of equipment and materials (as required for project):

i) Windows
ii) Doors

.3 Interim reviews of work progress on work schedule will be conducted as described by Architect and schedule updated by Contractor in conjunction with and with approval of Architect.

1.5 Contractor's Use

.1 USE OF SITE: Limit to those areas of the site designated by the City and the architect. Operators and activities should allow for storage, parking, deliveries, exits, fire safety and construction.

.2 Do not unreasonably encumber site with materials or equipment.

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

1.6 Partial Occupancy of Use

.1 Contractor to coordinate the Work with the continuing use of the remainder site.

1.7 Standards

.1 Where reference is made to specification standards produced by various organizations, conform to edition of standards specified or, if not specified, to latest edition as amended and revised to date of Contract.

.2 If requested provide copy on Site of such standard(s).

.3 Where standard designated authorities such as "Engineer", Designer", "Purchaser" or some other such designation, these designations shall be taken to mean "Architect".

1.8 Building Code

.1 Comply with The Building Code Act, as amended; and the Building Code, as amended; and Regulations and by-laws of other authorities having jurisdiction including latest amendments thereto: all hereafter referred to as Code where Code or Contract Documents do not cover particular requirement which is covered by National Building Code, 2005 conform to requirements of NBC including its related supplements. Where Drawings and/or Specifications exceed Code requirements satisfy such additional requirements.

.2 Where material is designated in Contract Documents for certain application, unless otherwise specified, that material shall conform to standards designated in Code and in absence of more restrictive requirement comply with "Housing and Small Buildings Part 9" of Code. Similarly, unless otherwise specified, and not required otherwise by Code, installation methods and standards of workmanship shall also conform to standards of Part 9. Where specific requirements for a material are not specified for certain use select from choice offered in Part 9.

1.9 Project Meetings

.1 Hold project meetings at times and locations requested by the Architect. Allow for bi-weekly meetings during construction.

.2 Notify all parties concerned of meetings.

.3 Record minutes of meetings, and distribute to all parties within 7 calendar days of meeting.

1.10 Setting Out of Work

.1 Assume full responsibility for and execute complete layout of work to locations, lines and elevations indicated.

.2 Provide devices needed to lay out and construct work.

.3 Supply such devices as ladders, measuring tapes, straight edges and templates required to facilitate Architect's inspection of work.

.4 Supply stakes and other survey markers required for laying out work.

.5 Any deviation from line and level shall be corrected without additional cost, to the Architect's satisfaction.

1.11 Location of Equipment and Fixtures

.1 Location of equipment, fixtures and outlets indicated or specified are to be considered as approximate. Do not scale drawing for locating of position. Obtain Architect's direction.

.2 Locate equipment, fixtures, and distribution systems to provide minimum interference and maximum usable space and in accordance with manufacturer's recommendations for safety, access, and maintenance.

.3 Inform Architect of impending installation and obtain his approval for actual location.

.4 Submit field drawings to indicate relative position of various services and equipment when required by Architect.

1.12 Concealment

.1 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.13 Cutting, Fitting, Patching

.1 Execute cutting including excavation, fitting, and patching required to make work fit properly together.

.2 Obtain Engineer's approval before cutting, boring or sleeving load-bearing members.

.3 Make cuts with clean, true, smooth edges. Make patches inconspicuous in final assembly.

.4 Fit work airtight to pipes, sleeves, ducts, and conduits.

.5 Cutting and patching to be by tradesmen qualified in the respective sections of the work.

1.14 Existing Services

.1 Before commencing Work, establish location and extent of existing services in area of Work and notify Architect.

.2 Whenever it is necessary to cut, interfere with, or connect to existing services or facility do so at hours and times recommended by governing authorities and approved by Architect; and with minimum disturbance to occupants, pedestrian and vehicular traffic and public and private property.

.3 Submit schedule to and obtain approval from Architect for each proposed shut-down of active service or facility. Adhere to approved schedule and provide notice to affected parties.

.4 If unknown services are encountered, immediately notify Architect and confirm findings in writing and/or on Drawings. Obtain Architect's written direction if such services require cutting, capping or relocation to do Work.

.5 Remove abandoned service lines within 2m of structures. Cap or otherwise seal lines at cut-off points as directed by Architect.

.6 Protect and record locations of maintained or rerouted service lines. Record locations of abandoned service lines.

1.15 Additional Drawings

.1 Architect may furnish additional drawings to assist proper execution of work. These drawings will be issued for clarification only. Such drawings shall have same meaning and intent as if they were included with plans referred to in Contract Documents.

1.16 Relics and Antiquities

.1 Relics and antiquities and items of historical or scientific interest such as cornerstones and contents commemorative plaques, inscribed tablets, and similar objects found on site or in buildings to be demolished, shall remain property of Owner. Protect such articles and request directives from Architect.

1.17 Coordination

.1 The Contractor will coordinate the work of all sub-contractors, including mechanical and electrical trades.

.2 Coordinate work of each Section as required for satisfactory and expeditious completion of Work. Take field dimensions. Take into account existing installations to assure best arrangements of components in available space. Consult before commencing Work in critical locations. Fabricate and erect Work to suit field dimensions and field conditions.

.3 Provide forms, templates, anchors, sleeves, inserts and accessories or other components required to be fixed to or inserted in Work. As applicable set them in place or instruct related Sections as to their location.

.4 Pay cost of extra work caused by, and make up time lost as result of failure to comply with these requirements at proper time.

.5 Cutting and patching as specified in sub-section above.

1.18 Modular Coordination

.1 Where work incorporates metric modular components following rules apply:

a) Actual opening dimensions in masonry including doors, windows, walls, louvres and actual room sizes are 10 mm (3/8") greater than nominal dimensions given on Drawings. Actual thicknesses of walls, piers and overall lengths of walls or buildings are 10 mm (3/8") less than nominal dimensions given on Drawings unless indicated otherwise.

b) Unless indicated otherwise Drawing details at scales of 1:10 and less indicate "actual" rather than "nominal" dimensions.

1.19 Examination

.1 Examine work upon which your work depends. Report in writing defects in such work. Application of your work shall be deemed acceptance of work upon which your work depends.

.2 Drawings are, in part, diagrammatic and are intended to convey scope of Work and indicate general and approximate location, arrangement and sizes of fixtures, equipment, ducts, piping, conduit and outlets and similar items. Obtain more accurate information about locations, arrangement and sizes from study and coordination of Drawings, including shop drawings and manufacturers' literature and become familiar with conditions and spaces affecting these matters before proceeding with Work.

.3 Where job conditions require reasonable changes in indicated locations and arrangements, make such changes with approval of Architect at no additional cost to Client. Similarly, where existing conditions interfere with new installation and require relocation, such relocation is included in Work.

.4 Install and arrange fixtures, equipment, ducts, piping and conduit to conserve as much headroom and space as possible, and avoid interference and obstruction of access. Observe good

installation practice for safety, access, maintenance and follow manufacturer's recommendations. Make changes requested to comply with these requirements at no additional cost to Client.

.5 If requested by Architect, and before installation, relocate equipment, services, doors, openings, furring and other work at no additional cost to Client; providing such relocation involves only reasonable minor adjustments and reasonable advance notice is given in writing.

1.20 Cold Weather Work

.1 Construction to continue work including winter months, if applicable, until Work is completed and accepted to meet the schedule. No additional costs for cold weather heating will be entertained.

1.21 Materials, Plant and Equipment

.1 Materials, plant and equipment specified shall form basis of Bid and Contract. Where more than 1 brand or manufacturer is named in Specifications, or on Drawings, choice is Bidders/Contractors provided requirements of Drawings and Specifications are met.

.2 Unless explicit statement is made in Bid/Contract Documents to say no substitutions will be permitted; then works "or approved alternate" are hereby deemed to apply to material, plant and equipment specified by brand or manufacturer, subject to following conditions

a) Request for substitution is made after Contract award and in accordance with provisions for substitutions set out in the General Conditions of the Contract.
b) Proposed substitution satisfies all other indicated or specified requirements and conditions.

.3 Materials, plant and equipment shall not be damaged or defective and shall be of quality compatible with Specifications for purpose intended. If requested provide evidence as to type, source and quality. Remove and replace defective products, at
own expense, regardless of previous inspections, and be responsible for delays and expenses caused thereby.

.4 Replace factory finished equipment, or parts thereof, whose paint finish is damaged and cannot be reasonably remedies by paint touch-up.

1.22 Material Storage and Handling

.1 Store packaged materials in original, undamaged containers with manufacturer's labels and seals intact. Handle and store materials in accordance with manufacturer's and suppliers' recommendations and in manner to prevent damage to materials during storage and handling.

1.23 Concealment of Work

.1 Conceal pipes, ducts conduits, tubing, wiring and other items requiring concealment in floor, wall and ceiling construction of finished areas except where indicated or specified otherwise. If in doubt as to method of concealment, or intention of Contract Documents in this connection, request clarification from Architect before proceeding with work in question.

.2 Lay out mechanical and electrical work in advance of concrete placement and furring installation to allow for its proper concealment.

.3 Test and inspect work before applying pipe covering and before Work is concealed.

1.24 Lines, Levels and Dimensions

.1 Have registered Ontario Land Surveyor establish 1 permanent bench marks on Site, referenced to established bench marks by survey control points. Provide and maintain control lines and level required.

.2 Lay out work in accordance with lines. levels and dimensions indicated and/or provided on bench marks established by survey.

.3 Verify lines, levels and dimensions. Report errors or inconsistencies in Drawings and obtain direction before commencing Work.

.4 Except as provided by survey, provide lines, levels and dimensions necessary to relate your work to work of other Sections.

1.25 General Workmanship

.1 Do Work in accordance with industry practice for type of work unless Contract Documents stipulate more precise requirements.

.2 Do Work in neat and careful manner to retain Work plumb, square and straight.

.3 Ensure Work is properly related to form close joints and appropriately aligned junctions, edges and surfaces and is free of warp, twist, wind, wave or other irregularities.

.4 When required by Specifications or by manufacturer's recommendations, have manufacturer, supplier or accredited agent, inspect work which incorporates their products.

.5 Do not permit materials to come in contact with other materials whether in presence of moisture or otherwise if conditions will result in corrosion, stain or discolouration or deterioration of completed Work. Provide compatible, durable separators where such contact is unavoidable.

1.26 Fasteners

.1 Supply appropriate fasteners, anchors, accessories and adhesives required for fabrication and erection of Work.

.2 Unless specified otherwise use exposed metal fasteners and accessories of same texture, colour and finish as product being fastened.

.3 Use metal fasteners of same material as metal component being fastened, or of metal which will not generate electrolytic action and cause damage to fastener or metal component under moist conditions. In general use noncorrosive or hot dip galvanized steel anchors occurring on or in exterior wall, slab or other exterior locations, unless higher standard is indicated or specified.

.4 Fastening devices or adhesives shall be of appropriate type, used in sufficient quantity and in such manner to provide positive, permanent fastening which will not shift, work loose or fail during occupancy of building due to vibration or other causes resulting from normal use of building. Install anchors at spacing to provide required load/stress carrying capacity. Do not use wood plugs.

.5 Lay out fasteners neatly, evenly spaced and aligned. Keep exposed fasteners to minimum.

.6 Supply adequate instructions and templates and, if necessary supervise installation, where fasteners or accessories for your Section are required to be built into work of other Sections.

.7 Do not use fasteners which will cause spalling, cracking, or deformation or deterioration of material being fastened by or to.

.8 Do not use powder actuated fastening devices, which are used in tension, without approval. Take stringent safety precautions when using powder actuated fasteners. Use only low velocity plunger-type devices.

.9 Use adhesives specified, or if not specified, those recommended by manufacturer of materials involved, compatible with materials to be joined, and effective in forming permanent joint of adequate strength.

.10 Use screws, nails, staples and other similar, driven fasteners suitable to materials to be joined and to conditions under which they are installed and used. Ensure that in finished work, fasteners are sized to take durable hold under stress to be encountered without damage to, or weakening of, elements secured together, and that fastenings will not corrode or cause staining of exposed surfaces.

.11 Do brazing or soldering to form durable connections of strength adequate to resist stresses to be encountered without deformation of elements joined. Prepare base metals and use methods and materials to ensure clean joint, and to prevent staining, corrosion, discolouration, deformation or other damage to finished Work.

.12 Do welding to CSA W59-M89 (for steel) or CSA W59.2-M91 (for aluminum) for material and methods, unless specified otherwise. Have welding performed by industry certified operatives to CSA W47.1-83 or CSA W47.2-M87.

1.27 Accessories

.1 Provide accessory items or materials required, such as brackets, cleats, connectors, sealants, lubricants, cleaners, protection, and similar items, whether specified or not, so that Work is complete and will perform as required.

1.28 Design and Safety Requirements for Temporary Work

.1 Be responsible for design, erection, operation, maintenance and removal of temporary structural and other temporary facilities. Engage and pay for registered Professional Engineering personnel skilled in appropriate disciplines to perform these functions where required by law or by the Contract Documents; and in cases where such temporary facilities and their method of construction are of such nature that Professional Engineering skill is required to produce safe and satisfactory results.

1.29 Protection and Safety

.1 Comply with requirements of Acts and Regulations with respect to health and safety including Occupational Health and Safety Act, as amended, and Workplace Hazardous Materials Information System (WHIMIS) Regulation, including following:

a) Before commencement of Work, and throughout Contract, maintain on Site, and readily accessible to all those who may be exposed to hazardous materials, list of hazardous materials proposed for use on Site or Workplace together with current Materials Safety Data Sheet (MSDS).
b) Ensure hazardous materials used and/or supplied on Site are labelled in accordance with WHIMIS requirements.

c) Know and be aware of the procedures for safe handling, storage and use of such hazardous materials including special precautions, safe clean-up and disposal procedures. Conform to Environmental Protection Act for disposal requirements.

d) ensure that those who handle, and/or are exposed to, or are likely to handle or be exposed to, hazardous materials are fully instructed and trained in accordance with WHIMIS requirements.

2. Protect excavation, trenches and building from damage from rainwater, ground water, backing up of drains or sewers and other water, frost and other weather conditions. Provide sheeting, piling, shoring, pumps, equipment, temporary drainage, protective covering and enclosures. Provide necessary pumps including spare pump for keeping project free of water throughout construction period.

.3 Protect, relocate and maintain existing, active services wherever they are encountered. Wherever inactive services are encountered, cap them off and remove unwanted portion, with approval of authorities having jurisdiction or public utility concerned in manner approved by them.

.4 Load no part of structure during construction with load greater than it is calculated to bear safely when completed. Make every temporary support as strong as permanent support. Place no load on concrete structure until it has sufficient strength to safely carry such load.

.5 Adequately protect floors and roofs from damage. Take special measures when moving heavy loads or equipment on them.

.6 Keep floors free of oils, grease or other materials likely to discolour them or affect bond of applied surfaces including fumes generated by temporary heating devices. Take care not to spill or allow oil, grease, gasoline, diesel and fuel oil, chemicals and other substances to contaminate soil or water on or adjacent to Site. Should such contamination accidentally occur report it immediately and clean up to satisfaction of Architect.

.7 Protect work of other Sections from damage resulting from your work.

.8 Damaged work shall be made good wherever possible by Section whose work is damaged but at expense of those causing damage.

.9 Protect glass and other finishes against heat, slag and weld splatter using suitable protective shields or covers.

.10 Prior to beginning of construction, design fire safety plan in conjunction with local Fire Chief. Post fire plan throughout construction and recommended. Do not allow accumulation of waste that may constitute fire hazard.

.11 Conform to Construction Safety Association of Ontario's manual on Propane in construction. Watch work area for minimum of 30 minutes after hot work is completed. Provide Site fire security when required by local building department and/or municipal fire department. Ensure that water supply is adequate for fire fighting.

.12 Provide and maintain in working order, suitable Underwriters' labelled fire extinguishers and locate in suitable positions, to approval of authorities having jurisdiction.

.13 Provide minimum of 3 safety helmets for Architect and any other authorized visitors to Site if required.

.14 Protect public and those employed on Work from injury. Equipment (mobile) when not in use shall have keys removed and locked up in secure location.

1.30 Scaffolding

.1 Erect scaffolding independent of walls. Use it in manner as to interfere as little as possible with other Sections. When not in use, move it as necessary to permit installation of other work. Construct and maintain scaffolding in rigid, secure and safe manner. Remove it promptly when no longer required.

1.31 Temporary Cleaning

.1 Keep Site and building, including concealed spaces, free from accumulation of dirt, debris, garbage and excess material. Remove oily rags and waste from premises at close of each day, or more often if required.

1.32 Manufacturers Directions

.1 Except where specified otherwise, use each product in accordance with manufacturer's published or written instructions, specifications or recommendations regarding handling, storage, preparation, Site conditions, ancillary products or accessories, methods of installation, protection and cleaning. Submit coy of such instructions, and indicate if and where there is discrepancy between them and requirements of Specifications and obtain direction.

1.33 Spare Products

.1 Where specified in other Sections, provide spare materials and products for future repair and replacement.

.2 Ensure such materials are of same production run as those incorporated in Work.

.3 Deliver quantities required, in separate labelled containers, and store where directed.

.4 Labels shall state material description, colour, pattern and location of installation.

1.34 Environmental Practices

.1 Take active role in implementing environmentally sound business practices and producing goods and services that lessen burden on environment in production, use and final disposition. Support implementation of reduction, reuse and recycling strategies and use of environmentally sound products. Reduce or eliminate excessive packaging and promote use of environmentally responsible packaging practices.

a) Environmentally Sound Products: Product that is made, used and disposed of in a manner that significantly reduces harm it would otherwise cause the environment. Product may be certified as environmentally sound because it is made in a way that improves energy efficiency, reduces hazardous by-products, uses recycled material, or because the product itself can be recycled or reused, or in some way is environmentally benign.

b) Packaging requirements: Implement waste reduction by reducing or eliminating excessive packaging practices.

c) Use, where appropriate, combination of packaging materials such as re-usable containers, blanket wrap or cushioning material provided that all reasonable requirements of materials handling, transportation and storage are observed.

d) Packaging materials such as kraft paper and corrugated cartons shall be made from reclaimed products to facilitate recycling of secondary materials.

e) Packaging material shall be clearly labelled to display their recycled content and recyclability.

f) Ensure that packaging materials are removed from Site and disposed of in environmentally responsible manner.

1.35 Waste Disposal

.1 Do not burn rubbish on Site. Obtain approval and use following off-Site disposal alternatives, depending upon materials involved; burying, composting, Municipal collection or local dump or sanitary landfill site.

1.36 Polychlorinated Biphenyl (PCB's)

.1 In event of unexpected discovery of PCB's immediately notify Architect orally and in writing and do not handle, disturb or remove items containing PCB's. Architect will authorize remedial work, if any, in writing. Do such remedial work as addition to Contract.

1.37 Spill Response Procedures

.1 The Contractor shall have written spill response procedures and material on-site to respond to pollutants and contaminants Into the natural environment in excess of levels permitted in regulations or cause or are likely to cause an adverse effect.

End of Section 01005

1.1 Allowance Overview

.1 Expend Cash Allowances only as directed and authorized by the Architect, and confirm in writing. Supply detailed and itemized costs for all Allowances in writing for the Architect's approval prior to proceeding with work.

.2 Unexpended amount(s) of cash allowances may be relocated to other specified cash allowances at the sole discretion of the Architect.

.3 Unexpended amount(s) of cash allowances shall be deducted from the Contract Price at completion of the work.

.4 Overhead and Profit for the General Contingency (held by the Owner) will be as set out in Section 00710.

.5 Do not include overhead and profit for work to be done under Cash Allowance Items noted below.

Overhead and Profit on cash allowances only applies when the cash allowance expenditure exceeds the sum stated for the particular allowance.

Then the overhead and profit on the excess amount will be allowed for the allowance in question as set out in Section 00710.

.6 General Contingency and all cash allowances do not include H.S.T. It is understood that 13% is to be added to the General Contingency and Cash Allowances.

1.2 Contingency

.1 **GENERAL CONTINGENCY FUND/ALLOWANCE:**
General Contingency Allowance will be held by the Building Owner.

1.3 Cash Allowances

There are currently no cash allowances for this project.

END OF SECTION 01020

1.1 Samples

.1 **Mandatory Sample Approval:**
Submit samples in sizes and quantities specified in all related sections as noted elsewhere herein. Samples are to be submitted for all interior and exterior building finishes unless noted otherwise. All samples are to be approved by the Architect before the related items are ordered and put into production as applicable. No items are to be installed on site without prior sample approvals by the Architect's office. Any installed items (not previously approved by sample submittal to the Architect) are subject to full rectification (to all aspects of the drawings, specifications, schedules and related Contract Documents) at no additional expense.

.2 **Verification of Product Names and Codes:**
All trades and sub-trades are responsible to verify that supplied and specified product *names* and *colour names* reconcile to the *numeric product codes* also provided throughout. All discrepancies between product names and codes (i.e. written description and product ordering numbers) are to be reported to the Architect prior to product ordering, fabrication and installation.

1.2 Co-ordination Submissions

.1 **Prior to first draw for payment being processed, the complete list of all shop drawings for the project shall be submitted and approved by all consultants. Updated shop drawing schedule to be submitted with each draw until all shop drawings have been processed.**

.2 Review shop drawings, product data and of samples prior to submission.

.3 Verify:
(a) Field measurements
(b) Field Construction Criteria
(c) Catalogue numbers and similar data

.4 Co-ordinate each submission with requirements of work and Contract documents. Individual shop drawings will not be reviewed until all related drawings are available.

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

.6 Contractor's responsibility for deviations in submission from requirements of contract documents is not relieved by Architect's review of submission, unless Architect gives written acceptance of specified deviations.

.7 Notify Architect, in writing at time of submission, of deviation from requirements of Contract documents.

.8 After Architect's review, distribute copies.

1.3 Submission Requirements

.1 Schedule submissions at least twenty-one (21) days before dates reviewed submissions will be needed.

.2 Submit shop drawings via pdf document for consultant review.

.3 Accompany submissions with transmittal letter, containing:
- (a) Date
- (b) Project title and number
- (c) Contractor's name and address
- (d) Number of each shop drawing, product data and sample submitted.

.4 Where additional copies of shop drawings or product data are required for distribution, they shall be marked by the Contractor to accord with the copies reviewed by Consultants.

.5 Submissions shall include:

(a) Date and revision dates
- (b) Project title and number
- (c) Name of:
  - (i) Contractor
  - (ii) Sub-contractor
  - (iii) Supplier
  - (iv) Manufacturer
  - (v) Separate detailer when pertinent
- (d) Identification of product or material
- (e) Relation to adjacent structure or materials
- (f) Field Dimensions, clearly identified as such
- (g) Specification Section number
- (h) Applicable standards, such as CSA or CGSB numbers
- (i) Contractor's stamp, initialed or signed, certifying review of submission, verification of field measurements and compliance with Contract documents.

.6 Final copy of shop drawings to the Client for record purposes.

.7 Shop Drawings not stamped with the Contractor's "Approved" stamp will be rejected.

.8 Shop Drawings requested to have Engineer’s seal submitted without said seal will be rejected.

End of Section 01340

1.1 Access

.1 Provide and maintain adequate access to project site.

.2 Do not encumber corridors with materials and keep clean.

1.2 Contractor's Site Offices

.1 The General Contractor shall provide for their own site offices and workshops for the entire length of Construction if required. Areas of work within the school are not available.

.2 Maintain in clean condition. Sweep daily.

.3 This facility not to be used for material storage.

1.3 Sanitary Facilities

.1 Sanitary facilities will not be designated for contractor's use within the school.

.2 Portable washroom to be installed in exterior compound area. Ensure it is secured to avoid damage and vandalism.

1.6 Parking

.1 Parking spaces will not be allowed off the property unless reviewed and approved by the City via parking permit.

.2 Do not interfere with adjacent and local existing traffic patterns including such items as bus routes, drop-off/pick-up lanes, etc.

1.7 Enclosure of Structure

.1 Provide temporary weather tight enclosures and protection for exterior openings until permanently enclosed.

.2 Provide and maintain dustproof and sound resistant barriers or partitions between the Work and existing occupied building.

1.8 Power

.1 Existing electrical power and lighting systems may be used for construction requirements with prior approval of Owner provided that guarantees are not affected. Make good damage. Replace lamps which have been used over a period of 3 months.

1.9 Water Supply

.1 Water supply is available.

1.10 Heating and ventilation

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

(a) Facilitate progress of work.
(b) Protect work and products against dampness and cold.
(c) Prevent moisture condensation on surfaces.
(d) Provide ambient temperatures and humidity levels for storage, installation and curing of materials.
(e) Provide adequate ventilation to meet health regulations

for safe working environment.

.3 Maintain minimum temperature of 10ºC or higher where specified as soon as finishing work is commenced and maintain until acceptance of structure by Architect.

.4 Ventilating:
(a) Prevent hazardous accumulations of dust, fumes, mists, vapours, or gases, in areas occupied during construction.
(b) Provide local exhaust ventilation to prevent harmful accumulation of hazardous substances into atmosphere of occupied areas.
(c) Provide mechanical ventilation to accelerate drying out of building if necessary to maintain schedule.
(d) Ventilate storage spaces containing hazardous or volatile materials.
(e) Continue operation of ventilation and exhaust system for time after cessation of work process to assure removal of harmful elements.

.5 Maintain strict supervision of operation of temporary heating and ventilating equipment to:
(a) Conform with applicable codes and standards
(b) Enforce safe practices
(c) Prevent abuse of services
(d) Prevent damage to finishes
(e) Vent direct-fired combustion units to outside.

1.11 Site Signs and Notices

.1 Only project identification and approved job sign and notices for safety or instruction are permitted on site.

.2 Signs and notices for safety or instructions to be in the English language, or commonly understood graphic symbols.

.3 Maintain sign and notices for duration of project. Remove sign and deliver to Owner off site on completion of project.

1.12 Scaffolding

.1 Construct and maintain scaffolding in rigid, secure and safe manner.

.2 Erect scaffolding independent of walls. Remove promptly when no longer required. Refer to Section 01545 for safety requirements for scaffolding.

End of Section 01500

1.1 Construction Safety Measures

.1 Observe and enforce construction safety measures required by the Ontario Building Code, Provincial Government, Worker's Compensation Board and Municipal Statutes and authorities.

.2 In event of conflict between any provision of the above authorities the most stringent provision will apply.

1.2 Fire Safety Requirements

.1 Provide and maintain in good working order, sufficient fire fighting equipment, tools, and extinguishers to contain an outbreak of fire.

.2 Comply with all requirements of the local authorities having jurisdiction in the storage and handling of flammable materials.

.3 Ensure all persons working at the site are conversant with action to be taken in the event of an outbreak of fire at the Work.

1.3 Overloading

.1 Ensure no part of work is subjected to a load which will endanger its safety or will cause permanent deformation.

1.4 Falsework

.1 Design and construct falsework in accordance with CSA S269.1-1975.

1.5 Scaffolding

.1 Design and construct scaffolding in accordance with CSA S269.2-M1980.

1.6 Smoking

.1 Smoking or vaping is not permitted anywhere on School Board Property.

End of Section 01545

1.1 General

.1 Use new material and equipment unless otherwise specified or directed in writing by the Architect.

.2 Within (7) days of written request by Architect, submit the following information for any or all material and products proposed for supply:

(a) Name and address of manufacturer
(b) Trade name, model, and catalogue number
(c) Performance, descriptive and test data
(d) Manufacturer's installation or application instructions
(e) Evidence of arrangements to procure

.3 Provide material and equipment of specified design and quality, performing to published ratings and for which replacement parts are readily available.

.4 Use products of one manufacturer for equipment or material of same type or classification unless otherwise specified.

1.2 Manufacturer's Instructions

.1 Unless otherwise specified, comply with manufacturer's latest printed instructions for materials and installation methods.

.2 Notify Architect in writing of any conflict between these specifications and manufacturers' instructions. Architect will designate which document is to be followed.

1.3 Fasteners - General

.1 Provide metal fasteners and accessories in same texture, colour and finish as base metal in which they occur. Prevent electrolytic action between dissimilar metals. Use non-corrosive fasteners, anchors and spacers for securing exterior work.

.2 Space anchors within limits of load bearing or shear capacity and ensure that they provide positive permanent anchorage. Wood plugs not acceptable.

.3 Keep exposed fasteners to minimum, space evenly and lay out neatly.

.4 Fasteners which cause spalling or cracking of material to which anchorage is made are not acceptable.

.5 Obtain Architect's approval before using explosive actuated fastening devices. If approval is obtained comply with CSA Z166-1975.

.6 Use fasteners of standard commercial Equipment sizes and patterns with material and finish suitable for service.

.7 Use heavy hexagon heads, semi-finished unless otherwise specified. Use no. 304 stainless steel for exterior areas.

.8 Bolts may not project more than one diameter beyond nuts.

.9 Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur and resilient washers with stainless steel.

1.4 Delivery and Storage

.1 Deliver, store and maintain packaged material and equipment with manufacturers' seals and labels intact.

.2 Prevent damage, adulteration and soiling of material and equipment during delivery, handling and storage. Immediately remove rejected material and equipment from site.

.3 Store material and equipment in accordance with suppliers' instructions and Section 01500.

.4 Touch-up damaged factory finished surfaces to Architect's satisfaction. Use primer or enamel to match original. Do not paint over name plates.

1.5 Substitution

.1 Proposals for substitution may be submitted after award of Contract. Such requests must include statements of respective costs of items originally specified and proposed substitutions. It is preferred that substitutions occur during the tender stage so that approved equivalents are allowed to be bid by all.

.2 Proposals will be considered by Architect if:

(a) Products selected by tenderer from those specified, are not available, or

(b) Delivery date of products selected from those specified would unduly delay completion of Contract, or

(c) Alternate products to those specified, which are brought to attention of, and considered by Architect as equivalent to those specified and will result in credit to Contract amount.

.3 Should proposed substitution be accepted either in part or in whole, assume full responsibility and costs when substitution affects other work on project. Pay for design or drawing changes required as result of substitution.

.4 Amounts of all credits arising from approval of substitutions will be determined by Architect and Contract price will be reduced accordingly. No substitutions will be permitted without prior written approval of Architect.

.5 The Owners reserve the right not to allow substitutions. Products specified are Boards standards and are consistent with systems standards.

1.6 Construction Equipment and Plant

.1 On request, prove to the satisfaction of Architect that the construction equipment and plant are adequate to manufacture, transport, place and finish work to quality and production rates specified. If inadequate, replace or provide additional equipment or plant as directed.

.2 Maintain construction equipment and plant in good operating order.

1.7 Work Surfaces

Millwork or other similar permanent surfaces, including loose or fixed and installed furniture and equipment are not to be used as work surfaces. Contractors and Subcontractors shall provide their own temporary work surfaces as required.

End of Section 01600

1.1 General

.1 Conduct cleaning and disposal operations to comply with local ordinances and anti-pollution laws.

.2 Store volatile wastes in covered metal containers and remove from premises daily.

.3 Prevent accumulations of wastes which create hazardous conditions.

.4 Provide adequate ventilation during use of volatile or noxious substances.

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 Cleaning During Construction

.1 On a daily basis maintain premises free from debris and waste material.

.2 Maintain project site and public properties free from accumulations of waste materials and rubbish.

.3 Provide on-site container for collection of waste materials and rubbish.

.4 Remove waste materials, and rubbish from site at regular intervals, or when container is full.

.5 Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for substantial completion or occupancy.

.6 Schedule cleaning operations so that resulting dust and other contaminants will not fall on areas prepared for finishes and/ or wet, newly painted surfaces.

1.4 Final Cleaning

.1 In preparation for substantial completion or occupancy, conduct inspection of sight-exposed interior surfaces.

.2 Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials, from sight-exposed interior finished surfaces including glass and other polished surfaces, resulting from own work.

.3 Broom clean paved surfaces; rake clean other surfaces of grounds.

.4 Remove debris and surplus materials from accessible concealed spaces.

.5 Replace broken, damaged or scratched glass and mirrors, which are part of the Work.

.6 Use appropriate apparatus and cleaning materials. Clean Work in accordance with applicable Sections and/or manufacturer's directions.

.7 Upon completion of final cleaning, remove cleaning equipment, materials and debris from building and Site.

End of Section 01700

1.1 Record Drawings

.1 Contractor will provide with two sets of white prints at the outset of construction for the progressive recording of items deviating from the drawings. At the completion of construction, this set of record drawings should reflect final 'as-built' conditions.

.2 Maintain project record drawings by accurately and progressively recording deviations from Contract documents caused by site conditions, and changes subsequent to Tender.

.3 Mark changes in coloured (red) ink.

.4 Record following information:

(a) Location and nature of mechanical and electrical building systems and related components not otherwise shown on the drawings.
(b) Horizontal and vertical location of underground utilities and appurtenances referenced to permanent surface improvement.
(c) Location of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of structure.
(d) Field changes of dimension and detail.
(e) All changes made by Change Order.

.5 At completion of project and prior to final inspection, neatly transfer notations from the original working set of drawings to the second final set. Submit both sets to Architect.

.6 The General Contractor shall note a $1,000.00 Hold Back value (to be identified in all draws) to cover final submission and of as-built drawings and Operation and Maintenance Manuals. Hold back values will be released upon consultant review and approval of completed submittal requirements.

END OF SECTION 01720

1.1 Maintenance

.1 On completion of project submit to Architect three copies of Operating and Maintenance Manuals in English, made up as follows:

a) Bind data in vinyl hard covered, 3-ring loose leaf binder for 215 x 180 mm sized paper

b) Enclose title sheet, labeled "Operating and Maintenance Data Manual", project name, date and list of contents.

c) Organize contents into applicable sections of work to parallel project specification breakdown. Mark each section by labeled tabs projected and celluloid covers fastened to hard paper dividing sheets.

In addition to 2 hardcopies of the Operating and Maintenance Manual, provide 1 electronic copy on USB stick.

.2 Include the following information:

a) Maintenance instruction for finished surfaces and materials.

b) Copy of hardware and Paint Schedules, paint layout drawings, Interior and Exterior Colour and Finish Schedules

c) Description, operation and maintenance instructions for equipment and systems, including complete list of equipment and parts list. Indicate nameplate information such as make, size, capacity and serial number.

d) Names, addresses and phone numbers of Sub-contractors and Suppliers.

e) Guarantees, warranties and bonds showing:
   i) Name and address of projects
   ii) Guarantee commencement date (date of Final Certificate of Completion).
   iii) Duration of guarantee.
   iv) Clear indication of what is being guaranteed and what remedial action will be taken under guarantee.
   v) Signature and seal of Contractor.

.3 Neatly type all information. Use clear diagrams or manufacturer's literature.

.4 Final payments will not be made until complete packages, as described at 1.1.1. to 1.1.3, are received by the Board. Promptness and completeness of these packages will be taken into account as part of pre-qualification applications for future Board projects regarding the 'past performance' criteria.

.5 *The General Contractor shall note a **$1,000.00 Hold Back value** (to be identified in all draws) will be retained to cover final submission and approval of as-built drawings and Operation and Maintenance Manuals. Hold back values will be released upon consultant review and approval of completed submittal requirements.*

END OF SECTION 01730

1.1 General

.1 Work of this Section includes demolition and removal from site of materials, finishes, fixtures, equipment etc., [related to the proposed scope of work] which may or may not be specifically spelled out on drawings.

.2 Division One [General Requirements] applies as if repeated herein.

1.2 Description

.1 Work included in this section but not limited to may involve the following:

- the demolition of portions of the existing building items, related services and associated features as noted on drawings and/or as required for completion of the scope of work outlined in the Contract Documents
- the selective demolition of the interior partitions, finishes, building systems, building components, system components etc. noted on the demolition drawings and/or as required for the full scope of work outlined in the Contact Documents
- the salvaging of items (denoted for removal not intended for re-integration into the project) to be offered to Owner for first right of refusal prior to discarding
- the removal of items from site and subsequent discard at an approved sanitary landfill site, recycling depot or similar approved facility suited to the nature of materials being removed

The work of this division shall include all temporary and permanent service disconnects required by items being demolished and/or disconnected as part of the scope of work illustrated in the Contract Documents.

.2 Clarify all unclear and ambiguous items with Architect immediately prior to demolition and construction.

1.3 Relocation

.1 Ensure that all items to be relocated (as per drawings), are carefully removed and stored on site for future relocation complete with all related components and accessories integral to their operation. Protect items during the course of construction to ensure their safety.

.2 Clarify all items, which may be ambiguous or unclear with the Architect and/or respective Engineer prior to any removal activity on the site.

1.4 Examination

.1 Examine site and premises and be satisfied as to condition of premises and means of access to same, and nature and quantity of work required.

.2 Examine drawings and documents and report ambiguous items and/or possible errors or omissions to the Architect immediately for clarification.

1.5 Coordination

.1 Coordinate all demolition activities with Building Owner relative to hours of operation and acceptable level of impact on ongoing building operations (as/if applicable). Work cooperatively with Owner and/or Occupants to determine acceptable hours and activities.

1.6 Protection

.1 Protect building occupants from demolition activities via construction hoarding or other means deemed acceptable to the Owner. Hoarding provisions to conform to related specification sections elsewhere herein.

.2 Throughout demolition, protect all existing building items and areas adjacent to demolition as required to prevent or minimize adverse impact on materials otherwise to remain. Repair and make good all existing finishes damaged throughout the course of construction to pre-construction condition and/or as designated by the Architect.

1.7 Utilities

.1 Where required, ensure that water, sewer, mechanical and electrical services are cut off and properly capped before commencing remainder of work, and notify appropriate authorities, building owner, building occupants etc. as required.

1.8 Removal of Debris

.1 All debris from the site and structure demolition, shall be removed from site immediately. There shall be no accumulation of demolished materials any shape or form in any location. All debris shall be removed in accordance with Section 01005 and related divisions as prescribed elsewhere herein.

1.9 Hazardous Materials

.1 All hazardous materials shall be removed from the facilities prior to demolition otherwise required for the scope of work. Refer to related Specifications and Appendix items contained herein for Designated Substances, Hazardous Materials Abatement and associated items.

END OF SECTION 02100

PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Related work specified elsewhere:

Section 02 82 00.01	Asbestos Abatement – Type 1 Procedures
Section 02 83 10	Lead Abatement – Class 1 Procedures
Section 02 83 11	Lead Abatement – Class 2 Procedures
Section 02 85 10	Silica – Minimum Precautions

.3 Site Conditions identifies all known hazardous building materials within the Project Area. The information provided is for general reference only. Each Contractor must confirm existing conditions on site prior to tender close.

.1 The specification fulfils the requirements of Section 30 of the Ontario Occupational Health and Safety Act.

.2 The specification fulfils the requirements of the Section 10 of Ontario Regulation 278/05.

.4 The Outline of Work identifies the location, condition and quantities of hazardous building materials to be removed as part of this project.

.1 It is the intent that work prescribed this Section will result in the removal of all hazardous materials as outlined and the decontamination of all surfaces or materials which may have been or become contaminated by hazardous materials either during or prior to work of this Contract.

1.2 Site Conditions

.1 Refer to the report entitled “Hazardous Building Materials Assessment, Window and Door Replacement, Lake Avenue elementary School, 157 Lake Avenue North, Hamilton, Ontario”, dated February 10, 2021, prepared by Pinchin Ltd., file number 269536.024.

1.3 Outline of Work

.1 Coordinate the following items with the Owner’s Project Manager and the Construction Manager, including but not limited to: electrical isolations, GFI connection, water connections, HVAC and exhaust ventilation system isolation, bin placement, schedule, disconnects, etc.

.2 Refer to the Contract Drawings for the extent of construction work and the Work Areas.

.3 Install Hoarding Walls between Abatement Work Areas and Occupied Areas.

.4 Using Type 1 procedures prescribed in the Section identified in Related Work, with full interior enclosures, remove and dispose of the following from Location 3 (1951 Section of the Building) and Location 4 (1974 Section of the Building):

.1 All windows, doors, transoms/spandrel panels, sills, framing, flashing, etc. where scheduled for removal.

.1 Dispose of entire window/door assembly as asbestos waste.

.2 All associated window and door caulking, sill mastic.

.1 Remove all residual caulking and mastic off the substrate (i.e. block, brick, plaster etc).

.3 All work should be completed in conjunction with Lead and Silica procedures prescribed in the Section identified in Related Work. Clean up Silica dust and paint debris where present.

.5 Using Type 1 procedures prescribed in the Section identified in Related Work, remove and dispose of the following from Location 5 (1983 Section of the Building):

.1 Asbestos-containing vinyl floor tiles where they will be disturbed by the removal/reinstallation of door frames/threshold sills.

.6 Using Type 1 procedures prescribed in the Section identified in Related Work, remove and dispose of fire doors presumed to contain asbestos where present throughout Locations 1, 3 and 4.

.1 Using Type 2 procedures in accordance with Ontario Regulation 278/05, repair damaged asbestos-containing pipe insulation if present above the solid ceiling within Vestibule 149 in Location 4.

.7 Use Lead procedures prescribed in the Section identified in Related Work when disturbing lead paint and or materials with lead paint.

.8 Use Silica procedures prescribed in the Section identified in Related Work when drilling into or disturbing materials containing silica.

.9 Refer to Specification Sections identified in the Related Work for specified personnel protective measures for the safe handling, removal, clean-up, of hazardous materials in each phase or work area.

.10 Visit the site prior to tender close to confirm the location and extent of any hazardous building materials or materials contaminated by hazardous materials.

.11 Protect surfaces, building fabrics and items remaining within the Abatement Work Area.

.12 Without disturbing hazardous materials, perform removals where required, prior to abatement work.

.13 Isolate the Abatement Work Area from adjoining Occupied and Non-Occupied Areas whether present at an interior or exterior location.

.14 Maintain emergency and fire exits from Abatement Work Area, or establish alternative exits satisfactory to Provincial Fire Marshall and local authorities having jurisdiction. Maintain extra routes from occupied areas. Place emergency exit signs at locations to clearly mark exit route. Seal emergency exit doors so as not to impede use of door during emergency evacuation.

.15 Remove and dispose of as appropriate waste, building components, materials and items contaminated by hazardous materials that cannot be effectively cleaned.

.16 Encapsulate remaining hazardous materials at locations where removal is deemed impractical by the Abatement Consultant.

.17 Encapsulation will not be permitted where removal of building materials or structures scheduled for demolition will facilitate access to the asbestos materials in question.

.18 Final clean work area to remove visible signs of asbestos and other hazardous materials, other debris or settled dust.

.19 Apply lock-down agent to exposed surfaces throughout the work area and to surfaces from which any hazardous materials have been removed.

.1 Do not apply lock-down to materials which would be damaged by its application.

.20 Unless otherwise specified, the handling, removal, clean-up or repair of hazardous materials or surfaces contaminated with hazardous materials is to be performed following wet removal techniques.

1.4 Schedule

.1 Provide necessary manpower, supervision, equipment and materials to maintain and complete the project on schedule.

.2 Work Hours:

.1 Coordinate all work, scheduling and phasing with the Owner.

.2 Duration for which HVAC systems may remain shutdown to accommodate quiet hours work will vary in accordance with outside weather conditions and internal demand. Duration of quiet hours work will have to be scheduled accordingly and in consultation with the Abatement Consultant and Owner.

.3 Provide 48 hours written notice to the Abatement Consultant of any request to work outside normal working hours. Obtain written approval before proceeding.

1.5 Definitions

.1 Abatement Consultant: Owner's Representative providing inspection and air monitoring.

.2 Abatement Contractor: Contractor or sub-contractor performing work of this section.

.3 Abatement Work Area: Area where work takes place which will, or may, disturb hazardous materials.

.4 Amended Water: Water with wetting agent added for the purpose of reducing surface tension to allow thorough wetting of materials.

.5 Asbestos: Any of the fibrous silicates defined in Regulation 278/05 including: actinolite, amosite, anthophyllite, chrysotile, crocidolite and tremolite.

.6 Asbestos-Containing Material (ACM): Material identified under Site Conditions including any debris, overspray, fallen material and settled dust.

.7 Authorized Visitors: Building Owner, Abatement Consultant, or designated representative, and persons representing regulatory agencies.

.8 Competent Worker: A worker who is qualified because of knowledge, training and experience to perform the work, is familiar with Regulation 278/05 and the Occupational Health and Safety Act, and has knowledge of the potential or actual danger to health and safety in the work.

.9 Contaminated Waste: Material identified under Site Conditions, including fallen material, settled dust, other debris and materials or equipment deemed to be contaminated by the Abatement Consultant.

.10 Curtained Doorway: Doorway consisting of two (2) overlapping flaps of rip-proof polyethylene arranged to permit ingress and egress from one room to another while permitting minimal air movement between rooms.

.11 DOP Test: A testing method used to determine the integrity of the Negative Pressure unit or vacuum using a Dispersed Oil Particulate (DOP) or Poly Alpha Olefin (PAO) HEPA filter leak test. This test is to be conducted on site where units are to be installed. Refer to the Environmental Abatement Council of Ontario (EACO) DOP/PAO Testing Guideline 2013 or ANSI/ASME N510-2007.

.12 HEPA: High Efficiency Particulate Aerosol filter that is at least 99.97 percent efficient in collecting a 0.3 micrometre aerosol.

.13 Lead-Containing: The Ontario Ministry of Labour (MOL) has not established a lower limit for concentrations of lead in paint, below which precautions do not need to be considered during construction projects. Pinchin follows the recommendations of the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair. The Guideline suggests that 0.1% (1,000 ppm) lead in paint represents a de minimis concentration of lead in paint for construction hygiene purposes, that is a concentration below which the lead content is not the limiting hazard in any disturbance of leaded paint for non-aggressive disturbance of painted finishes, (hand powered demolition, chipping, scraping, light sanding, etc.).

.14 Lead-containing: Paints containing lead at a concentration of 0.009% (90 ppm) or greater.

.15 Lead Waste: Waste generated from removal of lead-containing materials, or the substrate and paint finish where left intact.

.16 Mercury Waste: Equipment, materials or items containing mercury or contaminated with mercury.

.17 Milestone Inspection: Inspection of the Abatement Work Area at a defined point in the abatement operation.

.18 Negative Pressure: A reduced pressure within the Abatement Work Area (> 0.02 inches of water column) established by extracting air directly from Abatement Work Area and discharging it to exterior of building.

.19 Non-Friable Material: Material that when dry cannot be crumbled, pulverized or powdered by hand pressure.

.20 Occupied Area: Any area of the building or adjoining space outside the Abatement Work Area.

.21 Personnel: All Contractor's employees, sub-contractor's employees, supervisors.

.22 PCM: Phase Contrast Microscopy.

.23 Remove: Remove means remove and dispose of (as applicable type of waste) unless followed by other instruction (e.g. remove and turn over to Owner).

.24 TEM: Transmission Electron Microscopy.

1.6 Regulations and Guidelines

.1 Comply with Federal, Provincial, and local requirements, provided that in any case of conflict among those requirements or with these Specifications, the more stringent requirements shall apply. Work shall be performed under regulations in effect at the time work is performed.

.2 Where regulations are not present, follow accepted industry standards and applicable Guideline documents.

.3 Regulations and Guidelines include but are not limited to the following:

.1 Ministry of Labour Occupational Health and Safety Act Regulations for Construction Projects including Revised Statutes of Ontario 1990, Chapter 0.1 and Ontario Regulation 278/05.

.2 Ministry of the Environment and Climate Change Regulation for the disposal of waste, including R.R.O. 1990, Reg. 347 as amended.

.3 PCB Regulations, SOR 2008-273 and R.R.O. 1990, Reg 362.

.4 Regulation 490/09 Designated Substances.

.5 Environmental Abatement Council of Ontario (EACO), Lead Guideline For Construction, Renovation, Maintenance or Repair, October 2014.

.6 Ministry of Labour, Guideline, Silica on Construction Projects, 2011.

1.7 Quality Assurance

.1 Removal and handling of hazardous materials is to be performed by persons trained in the methods, procedures and industry practices for Abatement.

.2 Ensure work proceeds to schedule, meeting all requirements of this Specification.

.3 Complete work so that at no time airborne dust, visible debris, or water runoff contaminate areas outside the Abatement Work Area.

.4 Any contamination of surrounding area (indicated by visual inspection or air monitoring) shall necessitate the clean-up of affected area, and in the same manner applicable to an Abatement Work Area at no cost to the Owner.

.5 All work involving electrical, mechanical, carpentry, glazing, etc., shall be performed by licensed persons experienced and qualified for the work required.

1.8 Supervision

.1 Provide on site for each work shift, a Shift Superintendent(s), who has authority regarding all aspects related to manpower, equipment and production.

.2 Supervisory personnel must hold a recognized certificate proving attendance at an asbestos removal training course (2 day minimum duration) and have performed supervisory functions on at least five (5) other asbestos abatement projects of similar size and complexity.

.3 At all times during work, the Shift Superintendent(s) must be on site. Failure to comply with this requirement will result in a stoppage of all work, at no cost to the Owner.

.4 Replace supervisory personnel, with approved replacements, within three (3) working days of a written request from the Owner. Owner reserves the right to request replacement of supervisory personnel without explanation.

.5 Do not replace supervisory personnel without written approval from the Owner.

1.9 Instruction and Training

.1 Instruction and training must be provided by a competent person.

.2 All workers completing Type 1, 2 or 3 asbestos abatement must be trained in compliance with Section 19 of O.Reg. 278/05.

.1 For Type 3 asbestos abatement, workers must be trained and certified per Section 20 of O.Reg. 278/05.

1.10 Notification

.1 Before commencing work, notify orally and in writing, an inspector at the office of the Ontario Ministry of Labour nearest the project site, where required.

.2 Inform all trades on site of the presence and location of hazardous materials identified in the Contract documents.

.3 Notify the Owner or Owner’s Representative, the Joint Occupational Health and Safety Committee and the Provincial Ministry of Labour, if suspected asbestos-containing materials not identified in the contract documents are discovered during the course of the work. Stop work in these areas immediately.

.4 Notify Sanitary Landfill site as per O.Reg. 347/90 as amended.

1.11 Submittals

.1 Submit prior to starting work:

.1 Provincial Workers' Compensation Board Clearance Certificate.

.2 Insurance certificates.

.3 Copy of Company Health and Safety Policy and applicable programs.

.4 Ministry of Labour Notice of Project form.

.5 Copy of Certificate of Approval for disposal of hazardous materials waste and location of landfill.

.6 Pre-removal damage survey of the Abatement Work Area(s), waste transport routes, and bin storage areas

.2 Submit the following information regarding personnel prior to starting work:

.1 Proof in the form of a certificate that supervisory personnel have attended a training course on asbestos removal or are certified as supervisors under the Ministry of Training, Colleges and Universities course 253S.

.2 Written statement that personnel have had instruction on hazards of exposure to hazardous materials identified within this scope, the use of respirator, protective clothing, worker and waste decontamination procedures, and all aspects of work procedures and protective measures.

.3 WHMIS training certificates for all personnel.

.4 Certificate proving that each worker on site has been fit tested for the respirator appropriate for the work being performed.

.5 Proof of training for the following site-specific hazards or conditions identified:
.1 Working at Heights
.2 Elevated Work Platform.

.3 Submit the following information regarding HEPA filtered devices prior to construction of enclosure or asbestos abatement:
.1 Performance data on HEPA filtered vacuums including DOP tests no more than 3 months old.

.2 DOP tests to be performed by an independent testing company.
.1 DOP testing company is required to submit a detailed technical report of testing protocol, including Introduction, Methodology, Results, Conclusions, and Recommendations, including results of the Air-Aerosol Mixing Uniformity test as per ASME N510-1989 (1995).

.2 DOP testing company must also provide calibration certificates from an independent calibration firm or from the manufacturer of the testing equipment for both the aerosol photometer and the pressure gauge on the aerosol generator dated within 1 calendar year from the on-site testing date.

.3 DOP testing company must also provide the National Sanitation Foundation (NSF) certification name and number of the on-site technician performing the testing.

.3 Proof of calibration of DOP testing equipment.

.4 Submit the following prior to isolating the work area:

.1 Safety Data Sheets for chemicals or material used in the course of the Abatement Project.

.5 Submit the following upon completion of the work.

.1 Manifests, waybills, bills of ladings etc. as applicable for each type of waste.

1.12 Insurance

.1 Maintain a Pollution Liability Policy (or asbestos/lead liability policy or specific coverage under the CGL for asbestos/lead abatement) with an insurance company acceptable to Pinchin Ltd. And0 OWNER. The intent of this policy is to hold Pinchin Ltd. And0 OWNER harmless as it relates to claims for Bodily Injury or Property Damage or both, relating to the contract. Pollution Liability shall be provided on an “occurrence” basis to cover injury or damage (whether detected or not during the policy period) which happens during the policy period. Without limiting the generality of the foregoing, the policy shall insure the operations of abatement and shall not contain any environmental and/or health hazard exclusions relating to remediation operations.

.2 The limits will not be less than:

.1 Pollution Policy $5,000,000.00

1.13 Inspection

.1 From commencement of work until completion of clean-up operations, the Abatement Consultant is empowered by the Owner to inspect for compliance with the requirements of governing authorities, adherence to specified procedures and materials, and to inspect for final cleanliness and completion.

.2 The Abatement Consultant is empowered by the Owner to order a shutdown of work when leakage of asbestos from the controlled work area has occurred or is likely to occur.

.3 Any deviation from the requirements of the Specifications or governing authorities that is not approved in writing may result in a stoppage of work, at no cost to the Owner.

.4 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.

.5 Inspection and air monitoring performed as a result of Contractor's failure to perform satisfactorily regarding quality, safety, or schedule, shall be back-charged to the Contractor.

.6 Facilitate inspection and provide access as necessary. Make good work disturbed by inspection and testing at no cost to the Owner.

.7 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.

.8 Provide 24 hours written notice to the Abatement Consultant of any request for scheduling of milestone inspections or transportation of waste through Occupied Areas.

.9 The following Milestone Inspections may take place, at the Owner's cost, as outlined in each related specification section:

.1 Milestone Inspection - Clean Site Preparation

.1 Inspection of preparations and set-up prior to contaminated work in the Abatement Work Area.

.2 Milestone Inspection – Bulk Removal Inspection

.1 Inspection during asbestos removal, monitoring removal methods, site deficiencies, performing occupied air monitoring, etc.

.3 Milestone Inspection - Visual Clearance

.1 Inspection of Abatement Work Area after completion of all abatement, but prior to application of lock-down agents or dismantling of enclosure.

.10 Refer to the Sections identified in Related Work for specified milestone inspections which are to take place at defined points throughout the abatement operation specific to each phase or work area.

.11 Do not proceed with next phase of work until written approval of each milestone is received from the Abatement Consultant.

1.14 Air Monitoring - Asbestos

.1 Air monitoring will be performed using Phase Contrast Microscopy (PCM) following the National Institute for Occupational Safety and Health Method 7400.

.2 Co-operate in the collection of air samples, including providing workers to wear sample pumps for up to full-shift periods. Contractor will be responsible for the cost of testing equipment repairs or resampling resulting from the actions of the Contractor's forces.

.3 Results of PCM samples at or exceeding 0.05 fibres per cubic centimeter of air (fibre/cc) or greater, outside an Abatement Work Area, will indicate asbestos contamination of these areas. Respond as follows:

.1 Suspend work within the adjoining Abatement Work Area until written authorization to resume work has been received from the Abatement Consultant.

.2 Isolate and clean area in the same manner applicable to the Abatement Work Area.

.3 Maintain work area isolation, and repeat clean-up operations until visual inspection and air monitoring results are at a level equal to that specified.

.4 At the discretion of the Abatement Consultant provide additional negative air units at locations specified in response to elevated fibre levels being detected in the Clean Change Room or Occupied Areas.

.4 Results of PCM samples at or greater than 0.01 fibres per cubic centimeter of air (fibre/cc), collected within the Abatement Work Area enclosure after the site has passed a visual inspection, and an acceptable coat of lock-down agent has been applied, will indicate asbestos contamination of these areas. Respond as follows:

.1 Maintain work area isolation and re-clean entire work area. Then apply another acceptable coat of lock-down agent to exposed surfaces throughout the work area.

.2 Repeat above measures until visually inspected and air monitoring results are at a level equal to that specified

.3 Alternate to items above, the Asbestos Abatement Contractor can pay for analysis of PCM samples by Transmission Electron Microscopy (TEM) at NVLAP accredited laboratory.

.1 Enclosure to remain sealed, with negative pressure maintained, and subject to required daily inspections until TEM results are received.

.5 Additional labour or materials expended by the Contractor to rectify unsatisfactory conditions and to provide performance to the level specified shall be at no additional cost to the Owner.

.6 Cost of additional inspection and sampling performed as a result of elevated fibre levels in areas outside the Abatement Work Area or from within the work area following completion of work, will be back-charged to the Contractor.

1.15 Worker Protection

.1 Instruct workers before allowing entry to the Abatement Work Area. Instruction shall include training in use of respirators, dress, showering, entry and exiting from an Abatement Work Area, and all other aspects of work procedures and protective measures.

.2 Workers shall not eat, drink, chew gum or tobacco, vape or smoke in the Abatement Work Area.

.3 Workers shall be fully protected at all times when possibility of disturbance of hazardous materials exists.

.4 Provide soap, towels and facilities for washing of hands and face, which shall be used by all personnel when leaving the Abatement Work Area.

.5 Respiratory Protection

.1 Refer to each particular Section of the Specification for specified type of respiratory equipment specific to each phase or work area.

.2 Respirators shall be:

.1 Certified by the National Institute of Occupational Safety and Health (NIOSH) or other testing agency acceptable to the Ministry of Labour.
.2 Fitted so that there is an effective seal between the respirator and the worker's face. Ensure that no person required to enter an Abatement Work Area has facial hair which affects the seal between respirator and face.
.3 Assigned to a worker for their exclusive use.
.4 Maintained in accordance with manufacturer's specifications.
.5 Cleaned, disinfected and inspected by a competent person after use on each shift, or more often if required.
.6 Repaired or have damaged or deteriorated parts replaced.
.7 Stored in a clean and sanitary location.
.8 Provided with new filters as necessary, according to manufacturer's instructions.
.9 Worn by personnel who have been fit checked by qualitative or quantitative fit-testing.
.10 Instruction on proper use of respirators must be provided by a competent person as defined by the Occupational Health and Safety Act.

.3 Provide protective clothing, to all personnel which:

.1 Is made of a material that does not readily retain nor permit penetration of asbestos fibres or lead/silica dust.
.2 Consists of head covering and full body covering that fits snugly at the ankles, wrists and neck.
.3 Once coveralls are worn, treat and dispose of as contaminated waste.
.4 Is replaced or repaired if torn or ripped.

.4 Use hard hats, safety footwear and other protective equipment and apparel required by applicable construction safety regulations.

1.16 Visitor Protection

.1 Provide clean protective clothing and equipment to Authorized Visitors.

.2 Instruct Authorized Visitors in the use of protective clothing and Abatement Work Area entry and exit procedures.

.3 Authorized visitors are required to be fit tested on respirators, prior to entering Abatement Work Area.

.1 Respirator worn must be compliant with Section 13 and Table 2 of O.Reg. 278/05.

1.17 Signage

.1 Asbestos Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:

.1 There is an asbestos dust hazard.

.2 Access to the work area is restricted to persons wearing protective clothing and equipment.

.2 Lead Abatement Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:

.1 There is a lead dust, fume or mist hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the work area.

.3 Silica Warning Signs: Post signs at access points to the Abatement Work Area, stating at minimum, the following:

.1 There is a silica dust hazard.

.2 Access to the work area is restricted to authorized persons.

.3 Respirators must be worn in the work area.

.4 Vehicles, Bins and Asbestos Waste Containers: Post signs on both sides of every vehicle used for the transportation of asbestos waste and on every asbestos waste container. Signs must display thereon in large, easily legible letters that contrast in colour with the background the word “CAUTION” in letters not less than ten centimetres in height and the words:

.1 CONTAINS ASBESTOS FIBRES

.2 Avoid Creating Dust and Spillage

.3 Asbestos May be Harmful To Your Health

.4 Wear Approved Protective Equipment.

.5 Place placards in accordance with Transportation of Dangerous Goods Act.

1.18 Waste and Material Handling

.1 Waste bins must be placed on grade or in receiving.

.2 All bins for hazardous materials must be covered and locked when waste transfer is not being performed.

.3 Ensure redundant non-ACM, rubble, debris, etc. removed during contaminated work are treated, packaged, transported and disposed of as appropriate waste.

.4 Clean, wash and apply Post Removal Sealant to metal waste prior to removal from Abatement Work Area. Recycle metals.

.5 Clean, wash and apply Post Removal Sealant to non-porous materials prior to disposal as clean waste. Obtain prior written approval from the Abatement Consultant for each individual type of material.

.6 Clean and wash equipment prior to removal from Abatement Work Area if removed prior to completion.

.7 Place all equipment, tools and unused materials that cannot be cleaned in Abatement Waste Containers.

.8 As work progresses, and at regular intervals, transport the sealed and labelled waste containers from the Abatement Work Area to waste bin.

.9 Place items in bins according to waste classification. Place asbestos waste, lead waste, metals, non-asbestos waste, etc. in separate bins.

.10 Removal of waste containers and decontaminated tools and materials from the Abatement Work Area shall be performed as follows:

.1 Remove any visible contamination from the surface of non-porous or cleanable waste being removed from the Abatement Work Area. If the item can be cleaned, remove it from the site as clean waste.

.2 Place waste or item in Waste Container and seal closed.

.3 Wet wipe outside of Waste Container.

.4 Within Decontamination Facility, Transfer Room or at the perimeter of the Abatement Work Area, place in second Waste Container. Seal closed.

.5 Remove waste containers and transport to appropriate bin.

.11 Transport waste and materials via the predetermined routes and exits. Arrange waste transfer route with Owner. Use a closed, covered cart to transport through Occupied Areas.

.12 Provide workers transporting waste with means to access full personal protective equipment and all tools required to properly clean up spilled material in the case of a rupture of a Waste Container.

.13 Pick-up and drop off of garbage bin shall be at pre-approved times, and must not interfere with the Owners operations.

.14 Transport hazardous waste to landfill or waste transfer station licensed by the provincial Ministry of the Environment.

.15 Cooperate with the provincial Ministry of the Environment inspectors and immediately carry out instructions for remedial work at dump to maintain environment, at no additional cost to the Owner.

1.19 Re-establishment of Objects and Systems

.1 Re-establish objects and items relocated by the Contractor's workforce to facilitate work.

.2 Re-establish electrical, communication, HVAC and other services previously disconnected or otherwise isolated to accommodate work by this Section.

.3 Make good at completion of work, all damage not identified in pre-removal survey.

PART 2 PRODUCTS AND FACILITIES

2.1 Materials and Equipment

.1 Refer to the Sections identified in Related Work for specified materials, equipment or facilities specific to each phase or work area.

.2 Materials and equipment must be in good condition and free of debris and fibrous materials. Disposable items must be of new materials only.

.3 Airless Sprayer: AC powered pressure washer that allows wetting agent to mix with water, uses no air or compressed air, and has a nozzle to regulate power and pressure.

.4 Amended Water: Water with wetting agent added for purpose of reducing surface tension to allow thorough wetting of materials.

.5 Asbestos Waste Container: A container acceptable to disposal site, Ministry of the Environment, and Ministry of Labour, comprised of the following:

.1 Dust tight.

.2 Suitable for the type of waste.

.3 Impervious to asbestos.

.4 Identified as asbestos waste.

.6 HEPA Vacuum: Vacuum with necessary fittings, tools and attachments. Discharged air must pass through a HEPA filter.

.7 Hose: Leak-proof, minimum busting strength of 500 PSI or greater if required, abrasion resistant covering, reinforcing, and machined-brass couplings. Maintained and tested. Hose to be temperature resistant if it is to carry domestic hot water.

.8 Lead Waste Container: An impermeable container acceptable to disposal site and Ministry of the Environment, that is:

.1 Dust tight.

.2 Suitable for the type of waste.

.3 Evaluated for leachable lead content and disposed of in accordance with applicable regulations.

.1 Where lead waste exceeds 5.0 mg/L of lead in the TCLP analysis, label as lead waste and dispose of as leachate toxic hazardous waste.

.2 Where lead waste is below 5.0 mg/L of lead in the TCLP analysis, disposed of as construction waste.

.9 Polyethylene Sheeting: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.: 6 mil (0.15 mm) minimum thickness unless otherwise specified, in sheet size to minimize joints.

.10 Post Removal Sealant (or Lockdown): Sealant that when applied to surfaces serves the function of trapping residual asbestos fibres or other dust. Product must have flame spread and smoke development ratings both less than 50. Product shall leave no stain when dry. Post Removal Sealant shall be compatible with replacement insulation or fireproofing where required and capable of withstanding service temperature of substrate. Apply to manufacturer's instructions.

.11 Protective Clothing: Disposable coveralls complete with head covering and full body covering that fits snugly at the ankles, wrists and neck.

.12 Rip-Proof Polyethylene Sheeting: 8 mil (0.20 mm) fabric made up from 5 mil (0.13 mm) weave and two (2) layers of 1.5 mil (0.05 mm) poly laminate or approved equal. In sheet size to minimize on-site seams and overlaps.

.13 Sprayer: Garden type portable manual sprayer or water hose with spray attachment if suitable.

.14 Tape: Duct tape or tape suitable for sealing polyethylene to surfaces under both dry and wet conditions in the presence of Amended Water.

.15 Wetting Agent: Non-sudsing surfactant added to water to reduce surface tension and increase wetting ability.

PART 3 EXECUTION

.1 Refer to the Sections identified in Related Work for specified procedures for work area preparation, maintenance, site dismantlement, application of lock-down agent and all other procedures for the safe handling, removal and clean-up of hazardous materials specific to each phase or work area.

END OF SECTION

PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.

.2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of asbestos-containing materials following Type 1 or Low Risk procedures, and Pinchin and Owner specific requirements.

1.3 Personal Protection

.1 Protect all personnel at all times when possibility of disturbance of ACM exists.

.1 Provide non-powered half-face respirators with P100 high efficiency (HEPA) cartridge filters when requested by personnel.

.2 When requested by personnel, provide protective clothing.

.2 Provide protective clothing, to all personnel entering the Abatement Work Area.

.3 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

1.4 Inspections

.1 Refer to Part 1.13 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Remove stored or non-fixed items from the Abatement Work Area including but not limited to equipment, furniture, waste etc. Store in area provided by Owner.

.2 Moving of equipment, tools, supplies, and stored materials that can be performed without disturbing ACM will be performed by others.

.3 Remove visible dust and friable material from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.

.4 Install signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

.5 Provide power from ground fault interrupt circuits.

.6 Shut down HVAC systems serving the Abatement Work Area.

.1 Install polyethylene sheeting over openings in ducts and diffusers and seal.

.2 HVAC to remaining areas of building must not be disrupted during work of this section.

.3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.

.4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.

.7 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc).

.8 Without disturbing asbestos-containing materials, remove and dispose of non-hazardous materials as clean waste prior to asbestos removal work, where possible.

3.2 Site Preparation –Enclosure Required (Interior Work Areas)

.1 A full enclosure is to be constructed on the interior of the work areas prior to commencing with contaminated work.

.2 Install polyethylene enclosure complete with Windows at Abatement Work Areas.

.3 Install Transfer Room where duration of work is to last longer than one 8 hour shift.

.4 Seal openings in floor using tape, polyethylene, etc. Floor openings are to be sealed independently prior to installation of floor polyethylene.

.5 Install polyethylene sheeting on floors of Abatement Work Area. Use sufficient layers to provide adequate protection for carpeting and equipment.

.1 Minimum requirement over carpet is one layer of 6 mil polyethylene under one layer of rip-proof polyethylene.

.2 Cover floors first so that polyethylene on walls is overlapped by at least 305 mm.

.6 Install polyethylene sheeting at openings in walls and seal.

.7 Install 6 mil polyethylene sheeting on walls within the Abatement Work Area., including existing walls that make up, or are within, the Abatement Work Area.

.8 Provide a completely sealed polyethylene top for free standing enclosures.

.9 Install Curtained Doorways.

.10 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged. Items to remain include but are not limited to:

.1 Millwork.

.2 Radiators.

.3 Bulkheads.

.4 Electrical Equipment.

.5 Mechanical Equipment.

.11 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

.12 Place required tools to complete the abatement with the Abatement Work Area.

.13 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of an asbestos dust hazard.

3.3 Site Preparation – No Enclosure Required (Exterior Work Areas)

.1 Install caution tape around work area where existing walls are not present.

.2 Cover ground with rip-proof polyethylene sheeting before disturbing ACM to control the spread of dust.

.3 Place HEPA vacuum in Abatement Work Area.

.4 Place required tools to complete the abatement with the Abatement Work Area.

3.4 Maintenance of Abatement Work Area

.1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.

.2 Maintain Abatement Work Area in tidy condition.

.3 Remove any standing water on polyethylene/floor at the end of every shift.

.4 Turn off water supply to any hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.5 Asbestos Removal - General

.1 Do not use powered tools or non-hand held tools.

.2 Do not use compressed air to clean or remove dust or debris.

.3 Do not break, cut, drill, abrade, grind, sand or vibrate ACM if it cannot be wetted. Type 2 procedures would be required if the material cannot be wetted due to hazard or damage.

.4 Wet ACM prior to work and keep ACM wet throughout the removal process.

.5 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.6 Frequently and at regular intervals, place all waste in asbestos waste containers.

.7 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.6 Asbestos Removal - Vinyl Asbestos Tile

.1 Wedge a heavy duty scraper in seam of two adjoining tiles and gradually force edge of one tile up and away from floor. Do not break off pieces of tile, but continue to force balance of tile up.

.2 Place tile, without breaking into smaller pieces, into Asbestos Waste Container.

.3 Force scraper through tightly adhered areas by striking scraper handle with a hammer.

.4 Heat tile thoroughly with a hot air gun until heat penetrates through tile and softens adhesive in areas where scraper will not remove tile.

.5 Deposit scrapings into asbestos waste disposal bag.

.6 HEPA vacuum floor on completion of work in area.

3.7 Removal of Window, Doors, Flashing, Sills, Frames, etc.

.1 Wet all material to be disturbed.

.2 Undo fasteners with hand tools if necessary to remove material.

.3 Break material only if unavoidable, and wet material if broken during work.

.4 Use only non-powered hand-held tools to remove ACM.

.5 Dispose of entire window/door and frames as asbestos waste.

.6 Scrape residual caulking from substrate.

.7 Place removed ACM directly into an asbestos waste container.

3.8 Abatement Work Area Dismantling

.1 Wash or HEPA vacuum equipment and tools used in contaminated Abatement Work Area to remove all asbestos contamination, or place in Asbestos Waste Containers prior to being removed from Abatement Work Area.

.2 Place tools and equipment used in contaminated work site but not cleaned in polyethylene bags prior to removal from Abatement Work Area.

.3 Clean polyethylene sheeting and drop sheets which with HEPA vacuum or wet cleaning methods at completion of work.

.4 Wet drop sheets and polyethylene sheeting.

.5 Carefully roll polyethylene sheeting and drop sheets toward the centre. As polyethylene is rolled away, immediately remove visible debris beneath with a HEPA vacuum.

.6 Remove remaining polyethylene sheeting and tape.

.7 Place polyethylene sheeting, drop sheets, tape, disposal clothing and other contaminated waste in asbestos waste containers, wet wipe and place in second asbestos waste container.

3.9 Waste and Material Handling

.1 Refer to Section 02 81 00.

END OF SECTION

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PART 1 GENERAL

.1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.

.2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of lead-containing materials following Class 1 or Low Risk procedures, and Pinchin and Owner specific requirements.

.3 Comply with requirements of this Section when performing following Work:

.1 Removal of lead-containing surface coatings with a chemical gel, stripper or paste.

.2 Removal of materials coating with lead-containing surface coatings, using non-powered hand tools, where the materials remains primarily intact, and is not crumbled, pulverized or powdered.

.3 Disturbance of finishes with lead-containing paint.

.4

1.3 Instruction and Training

.1 Provide instruction and training to all workers including the following:

.1 Hazards of lead.

.2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

.3 Personal hygiene to be observed when performing the work.

.4 The measures and procedures prescribed by this section including decontamination of the worker.

.5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

.1 Provide non-powered half-face respirators with P100 high efficiency cartridge filters when requested by personnel.

.2 Provide protective clothing, when requested by personnel, entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

.3 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Dust impermeable gloves appropriate for the work being completed.

.4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.5 Lead-specific soaps and hygiene indicators are recommended to be provided for shower and hand-wash stations.

1.5 Inspections

.1 Refer to Part 1.13 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

2.1 Curtained Doorways

.1 Construct as follows:

.1 Install two flap doors, full width and height of door opening at all doors to Abatement Work Area and both ends of Transfer Room.

.2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.

.3 Install weights attached to bottom edge of each door flap.

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.2 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

.3 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Abatement Work Area that are

to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.4 Shut down HVAC systems serving the Abatement Work Area.

.1 Install polyethylene sheeting over openings in ducts and diffusers and seal.

.2 HVAC to remaining areas of building must not be disrupted during work of this section.

.3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.

.4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.

.5 Remove visible dust from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.

.6 Provide amended water for wetting materials, and adequate method of wetting (garden sprayers, airless sprayers, etc.).

.7 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

.8 Do not use compressed air to clean or remove dust or debris.

.9 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.10 Frequently and at regular intervals, place all waste in waste containers.

.11 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.2 Site Preparation – No Enclosure Required

.1 Isolate Abatement Work Area with barrier tape.

.2 Protect floor surfaces covered from wall to wall with polyethylene sheets.

.3 Maintain Abatement Work Area in tidy condition.

.4 Remove waste and debris frequently.

.5 Remove standing water on polyethylene/floor at the end of every shift.

.6 Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.3 Lead-Containing Paint Abatement

.1 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.2 Wetting agents should be used where possible.

.3 Wet methods are not to be used if it creates a hazard or cause damage to equipment or to project.

.2 Provide drop sheets below all lead operations that may produce dust, chips or debris containing lead.

.3 Waste water from cleaning or removal operations must be contained, for treatment or disposal.

.4 Remove lead-containing paint in small sections and pack as it is being removed in sealable lead waste containers.

.5 Follow manufacturer's instructions for all use of chemical gels, strippers and pastes.

.1 Ensure agent neutralizers, were required, are applied.

.2 Do not use chemical gels, strippers or pastes on surfaces where they are scheduled to be repainted, and the material affect the new paint application.

.6 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.7 After wire brushing and wet sponging to remove visible lead-containing paint, wet clean entire work area, and equipment used in process.

.1 Compressed air or dry sweeping not be used to clean up lead-containing dust or waste.

.2 Ensure all waste is cleaned and packaged.

.8 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside.

3.4 Waste Management and Disposal

.1 Per Section 02 81 00.

3.5 Final Cleaning

.1 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.

.2 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.

.3 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

END OF SECTION

PART 1 GENERAL

.1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.

.2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of lead-containing materials following Class 2 or Moderate Risk procedures, and Pinchin and Owner specific requirements.

.3 Comply with requirements of this Section when performing following Work:

.1 Removal of lead containing paint using power tools with an effective dust collection system equipped with HEPA filter.

.2 Removal of lead-containing surface coatings or materials by scraping or sanding (including wet sanding) using non-powered hand tools.

.3 Demolition of plaster or other building components that crumble, pulverize or powder and are covered with lead-containing surface coating.

1.3 Instruction and Training

.1 Provide instruction and training to all workers including the following:

.1 Hazards of lead.

.2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

.3 Personal hygiene to be observed when performing the work.

.4 The measures and procedures prescribed by this section including decontamination of the worker.

.5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

.1 Provide the following respiratory protection to all personnel, at minimum:

.1 Non-powered half-face respirators with P100 high efficiency cartridge filters.

.2 Provide protective clothing, to all personnel entering the Abatement Work Area, including:

.1 Dust impermeable gloves appropriate for the work being completed.

.2 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

.3 Provide protective clothing, to all personnel entering the Abatement Work Area.

.4 Wear hard hats, safety shoes and other personal protective equipment required by applicable construction safety regulations.

.5 Lead-specific soaps and hygiene indicators are recommended to be provided for shower and hand-wash stations.

1.5 Inspections

.1 Refer to Part 1.13 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

2.2 Transfer Room

.1 Transfer Room to be generally 2000 mm x 2000 mm x 2200 mm high. Increase size accordingly to accommodate number of workers.

.2 Install walls as follows:

.1 Install 38 x 89 mm wood framing at 610 mm o/c with continuous top and sill plates.

.2 Install one layer rip-proof polyethylene sheeting on interior walls of Transfer Room.

.3 Install one layer of rip-proof polyethylene sheeting over two layers of 6 mil polyethylene sheeting beneath entire Transfer Room.

.4 Install one layer rip-proof polyethylene sheeting over roof.

.5 Turn 600 mm of polyethylene down the sides over polyethylene on the perimeter walls.

.6 Install a fire extinguisher, mount to wall.

2.3 Curtained Doorways

.1 Construct as follows:

.1 Install two flap doors, full width and height of door opening at all doors to Abatement Work Area and both ends of Transfer Room.

.2 Construct each flap door of two layers of polyethylene sheeting with all edges reinforced with tape. Use wood strapping to securely fasten flap doors to head and alternate jambs.

.3 Install weights attached to bottom edge of each door flap.

.4 Provide direction arrows on flaps to indicate opening.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.2 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

.3 Isolate, at panel, and disconnect existing power supply to Abatement Work Area. Power supply to remaining areas of building must not be disrupted during work of this section.

.1 Lock-out/tag-out power at electrical panels.

.2 Mark/tag any items within or passing through the Abatement Work Area that are to remain live including but not limited to cable, conduit, wire, fixtures, equipment panels, etc.

.4 Shut down HVAC systems serving the Abatement Work Area.

.1 Install polyethylene sheeting over openings in ducts and diffusers and seal.

.2 HVAC to remaining areas of building must not be disrupted during work of this section.

.3 System shall remain inoperative until completion of work, unless ducts can be effectively capped.

.4 Perform work at scheduled times after shutting down HVAC systems affecting the Abatement Work Area.

.5 Remove visible dust from all surfaces in the work area including those to be worked on, using HEPA Vacuums or wet wiping.

.6 Provide amended water for wetting materials, and adequate method of wetting (garden sprayers, airless sprayers, etc.).

.7 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

.8 Do not use compressed air to clean or remove dust or debris.

.9 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.10 Frequently and at regular intervals, place all waste in waste containers.

.11 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

3.2 Site Preparation –Enclosure Required

.1 Install Transfer Room where duration of work is to last longer than one 8 hour shift.

.2 Install Curtained Doorways.

.3 Install polyethylene sheeting at openings in walls (as required) and seal.

.4 Seal openings in floor using tape, caulking, polyethylene, etc. Floor openings are to be sealed independently prior to installation of floor polyethylene.

.5 Install polyethylene sheeting on floors of Abatement Work Area. Use sufficient layers to provide adequate protection for carpeting and equipment.

.1 Cover floors first so that polyethylene on walls is overlapped by at least 305 mm.

.6 Install 6 mil polyethylene sheeting on walls to remain, within the Abatement Work Area., including existing walls that make up, or are within, the Abatement Work Area.

.7 Install one layer of 6 mil polyethylene sheeting so as to protect all equipment and finishes in the Abatement Work Area that may be damaged.

.8 Place required tools to complete the abatement with the Abatement Work Area.

.9 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

.10 Establish negative pressure in Abatement Work Areas as follows:

.1 Provide sufficient HEPA filtered negative pressure machines to exchange a volume of air equivalent to that of the Abatement Work Area a minimum of every 20 minutes.

.2 Provide additional HEPA filtered negative pressure machines as required to ensure air flow from Occupied Area into Abatement Work Area.

.3 Operate HEPA filtered negative pressure machines continuously from first disturbance of ACM until completion of dismantling.

.4 Replace prefilters to maintain specified flow rate.

.5 Replace HEPA filter as required to maintain flow rate and integrity of unit.

.6 Discharge HEPA filtered negative air machines to building exterior, where possible.

.1 Direct discharge away from building access points.

.11 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of lead hazard, and lead hazard where appropriate.

3.3 Site Preparation – No Enclosure Required

.1 Cover materials to remain in the Abatement Work Area with polyethylene sheeting before disturbing ACM to control the spread of dust.

.2 Install caution tape around work area where existing walls are not present.

.3 Install temporary lighting in enclosure to a level that will provide for safe and efficient use of work area - minimum 550 LUX.

.4 Place HEPA vacuum in Abatement Work Area.

.5 Place required tools to complete the abatement with the Abatement Work Area.

.6 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of a lead dust hazard.

3.4 Maintenance of Abatement Work Area

.1 Inspect polyethylene sheeting and ensure it is effectively sealed and taped. Repair damage and remedy defects immediately.

.2 Inspect electrical panels and ensure locks and tags are on panels prior to entering the Abatement Work Area.

.3 Inspect HEPA filtered negative pressure machines including discharge ducting at the beginning and end of each working period. Inspection must be performed by competent person.

.4 Maintain Abatement Work Area in tidy condition.

.5 Remove standing water on polyethylene/floor at the end of every shift.

.6 Turn off water supply to any hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.5 Lead Abatement

.1 Use the procedures described above under *Site Preparation – Enclosure Required*.

.1 Removal of lead-containing surface coatings or materials by scraping or sanding (including wet sanding) using non-powered hand tools.

.2 Demolition of plaster or other building components that crumble, pulverize or powder and are covered with lead-containing surface coating.

.2 Use the procedures described above under *Site Preparation – No Enclosure Required*.

.1 Removal of lead containing paint using power tools with an effective dust collection system equipped with HEPA filter.

.3 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.4 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.1 Wetting agents should be used where possible.

.2 Wet method not be used if it creates a hazard or cause damage to equipment or to project.

.5 Provide drop sheets below all lead operations that may produce dust, chips or debris containing lead.

.6 Waste water from cleaning or removal operations must be contained, for treatment or disposal.

.7 Remove lead containing paint in small sections and pack as it is being removed in sealable waste containers.

.8 Waste generated should be maintained wet until cleaned and packaged.

.9 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.

.10 After wire brushing and wet sponging to remove visible lead containing paint, wet clean entire work area, and equipment used in process.

.1 Compressed air or dry sweeping not be used to clean up lead-containing dust or waste.

.2 Ensure all waste is cleaned and packaged.

.11 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.

.12 The Abatement Work Area is not to be dismantled until acceptable lead wipe sample results are achieved.

.1 If lead wipe sampling exceeds the clearance criteria the Abatement Work Area will require re-cleaning and re-sampling.

.2 Obtain Abatement Consultant's written permission to proceed.

3.6 Waste Management and Disposal

.1 Per Section 02 82 00.

3.7 Final Cleaning

.1 Following specified cleaning procedures, and when lead wipe sampling is below acceptable concentrations proceed with final cleanup.

.2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Clean visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.

.3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and seal. Dispose of in accordance with waste materials generated.

.4 Clean Work areas and Transfer Room, where present.

.5 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.

.6 Conduct final check to ensure no dust or debris remain on surfaces as result of dismantling operations.

END OF SECTION

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PART 1 GENERAL

1.1 General and Related Work

.1 Read this Section in conjunction with all drawings and all other Sections so as to comply with the requirements of the General Conditions of the Contract.

.2 Requirements specified elsewhere:

.1 Section 02 81 00 Hazardous Materials – General Provisions

1.2 Outline of Work

.1 Refer to Section 02 81 00 Hazardous Materials – General Provisions for the Outline of Work.

.2 The intent of this Section is to provide safe work practices and procedures to govern the handling, removal, clean-up and disposal of silica-containing materials following Type 1 or Low Risk procedures, and Pinchin and Owner specific requirements.

.3 Comply with requirements of this Section when performing following Work:

.1 Drilling of holes in concrete or rock, excluding tunneling operations and road construction

.2 Any operation at a project that requires handling of silica-containing material in a way that may result in a worker being exposed to airborne silica, and not defined in other sections.

1.3 Instruction and Training

.1 Provide instruction and training to all workers including the following:

.1 Hazards of silica.

.2 Use, care and disposal of protective equipment (including but not limited to respirators and filters) and clothing that would be used and worn during abatement work, including:

.1 Limitations of equipment.

.2 Inspection and maintenance of equipment.

.3 Proper fitting of equipment.

.4 Disinfecting and cleaning of equipment.

.3 Personal hygiene to be observed when performing the work.

.4 The measures and procedures prescribed by this section including decontamination of the worker.

.5 Instruction and training must be provided by a competent person.

1.4 Personal Protection

.1 Provide non-powered half-face respirators with P100 high efficiency cartridge filters.

.2 Provide protective clothing, when requested by personnel, entering the Abatement Work Area, including:

.1 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.

1.5 Inspections

.1 Refer to Part 1.13 Inspections in Section 02 81 00 – General Provisions.

.2 The following Milestone Inspections are to be scheduled:

.1 Milestone Inspection - Clean Site Preparation

.2 Milestone Inspection – Bulk Removal Inspection

.3 Milestone Inspection - Visual Clearance

PART 2 PRODUCTS AND FACILITIES

.1 Refer to Section 02 81 00.

PART 3 EXECUTION

3.1 Site Preparation - General

.1 Stored or non-fixed items, including but not limited to equipment, furniture, waste etc., shall be removed from the Abatement Work Area prior to abatement work.

.2 Provide amended water for wetting ACM, and adequate method of wetting (garden sprayers, airless sprayers, etc).

.3 Provide electrical power and shut off for operation of powered tools and equipment. Provide ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard.

.1 Ensure safe installation of electrical lines and equipment.

.4 Do not use compressed air to clean or remove dust or debris.

.5 Frequently and at regular intervals during the work, clean up dust and waste using HEPA vacuums and/or wet sweeping or mopping.

.6 Immediately upon completion of work, clean area with HEPA vacuum and/or wet sweeping or mopping.

.7 Remove standing water on polyethylene/floor at the end of every shift.

.8 Turn off water supply to hoses and reduce pressure in hose, prior to leaving the Abatement Work Area at end of shift.

3.2 Site Preparation – No Enclosure Required

.1 Isolate Abatement Work Area with barrier tape located a minimum of 10 metres away from work being performed.

.2 Install Signage in clearly visible locations and in sufficient numbers to adequately warn of a silica dust hazard.

.3 Maintain Abatement Work Area in tidy condition.

.4 Remove waste and debris frequently.

.5 Place required tools to complete the abatement with the Abatement Work Area.

3.3 Silica Handling

.1 Provide washing facilities consisting of a wash basin, clean water, soap and towels.

.1 Workers are to use washing facilities each time leaving the Abatement Work Area.

.2 Removal methods minimizing dust generation should be used wherever possible.

.1 Wet methods are to be used to reduce dust generation.

.1 Wetting agents should be used where possible.

.2 Wet methods should not be used if it creates a hazard or cause damage to equipment or to project.

.2 Power tools to be equipped with a shroud and HEPA vacuum, and to be kept flush with surface.

.3 Waste generated should be maintained wet until cleaned.

END OF SECTION

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PART 1 - GENERAL

1.1 Description of Work

.1 Including the following but not limited to: sheathing, furring, rough framing, grounds, blocking, rough hardware, wood preserving, concealed wood anchoring within stud wall assemblies for all metal door and glazing screen frames, concealed wood anchoring for all wall and/or ceiling mounted fitments, features and equipment items identified on the drawings, etc.

.2 Temporary carpentry, including fencing, hoarding, etc. as required throughout the course of construction to comply with all items in Division 1.

1.2 Related Work Specified Elsewhere

.1	Finish Carpentry	Section 06200
.2	Architectural Woodwork/Millwork	Section 06400

1.3 Source Quality

.1 Identify lumber by grade stamp of an agency certified Control by Canadian Lumber Standard Administration Board.

.2 Identify pressure treated wood by stamp of approval and Licensed applicator of Kopper's "Wolmanized" system.

PART 2 - PRODUCTS

2.1 Lumber

.1 Except as indicated or specified otherwise, lumber materials shall be softwood, not greater than 19% moisture content at time of installation, in accordance with the following standards:
(a) CSA 0141
(b) NLGA Standard Grading Rules for Canadian Lumber, effective 1979.

.2 Machine stress-rated lumber is acceptable for all purposes.

.3 Framing and board lumber; in accordance with Table 9.3.2A of O.B.C. 1990 except as indicated or specified otherwise.

.4 Plywood coping and sheathing: exterior grades thickness as shown.

.5 Preserved wood: pressure treated softwood, to CSA 080, using Wolman CCA preservative.

.6 Plywood: CSA 0151M - Softwood.

2.2 Fastenings and Hardware

.1 Nails, spikes and staples.

(a) Use common spiral nails and spiral spikes except where indicated otherwise.
(b) Use hot galvanized finish steel for exterior work, pressure-preservative treated lumber except where indicated otherwise.

.2 Bolt, nut, washer, screw and pin type fasteners: with hot-dip galvanized finish for exterior work, interior highly humid areas and for pressure-preservative treated lumber; elsewhere with primer paint finish where installed on sight-exposed surfaces.

.3 Use surface fastenings of following types, except where specific type is indicated.

(a) To hollow masonry, plaster and panel surfaces use toggle bolt.
(b) To solid masonry and concrete use expansion shield with lag screw or lead plug with wood screw.
(c) To structural steel use bolts through drilled hole or welded stud-bolts or power driven self-drilling screws.

PART 3 - EXECUTION

3.1 Furring and Blocking

.1 Install furring and/or solid wood blocking as required to support and/or to solidly anchor finishes, fitments, features, white boards and all wall and ceiling-mounted equipment items throughout. Use solid wood blocking within concealed wall, ceiling and/or bulkhead assemblies as required.

.2 Align and plumb face of furring and blocking to tolerance of 1:600.

.3 Ensure provision of continuous 2” wide x depth to suit wood blocking around all door frames in steel stud wall assemblies. Blocking depth to be full depth of steel studs surrounding door/glazing screen framing.

3.2 Rough Bucks

.1 Install wood bucks and nailers as indicated and/ or where nailers required.

.2 Except where indicated otherwise use material at least 38mm thick secured with 9mm bolts located within 300mm from ends of members and uniformly spaced at not over 1200mm between.

.3 Countersink bolts where necessary to provide clearance for other work.

3.3 Coping, Curbs and Sheathing

.1 Install backing, curbs and other wood supports for roofing and sheet metal work, and roof mounted equipment, as indicated.

.2 Secure with galvanized bolts where indicated, galvanized screws elsewhere. Locate fastenings within 300mm from ends and uniformly spaced between. Space bolts at 1200mm maximum and nails at 600mm centers maximum except where indicated otherwise.

.3 Install wood nailers for roof hopper, dressed, tapered and recessed slightly below surface of roof insulation.

END OF SECTION 06100

PART 1 - GENERAL

The work under this section consists of the following but is not limited to:

1.1 Description

.1 Installation of miscellaneous wood and/or millwork trim items as indicated on drawings.

.2 Installation of pressed hollow metal door frames, supplied under Section 08100.

.3 Hanging of hollow metal doors supplied under other sections.

.4 Installation of Finished Hardware supplied under Section 08710.

1.2 Related Work Specified Elsewhere

.1	Rough Carpentry	Section 06100
.2	Architectural Woodwork	Section 06400
.3	Steel Doors and Frames	Section 08100
.4	Wood Doors	Section 08210
.5	Finish Hardware	Section 08710
.6	Painting and Finishing	Section 09900

1.3 Reference Standards

.1 Do millwork to millwork standards of the Architectural Woodwork Manufacturers Association of Canada (AWMAC).

1.4 Samples

.1 Submit duplicate 300mm x 300mm samples of each type of panelling and each type of solid wood or plywood to receive paint finish, in accordance with Section 01340.

.2 Submit duplicate 300mm long samples of each type of trim moulding, in accordance with Section 01340.

PART 2 - PRODUCTS

2.1 Materials

.1 Softwood Lumber: to CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content of 10%.

.2 Hardwood Lumber: to National Hardwood Lumber Association (NHLA) requirements; moisture content to AWMAC - premium grade; species, red oak or birch as indicated or scheduled.

2.2 Millwork

.1 Mill wood components to dimensions and profiles indicated on the drawings.

.2 All faces to be machine dressed finish.

PART 3 - EXECUTION

3.1 Interior Trim

.1 Standing and running trim to be AWMAC custom grade construction.

.2 Trim to be of species as detailed.

.3 Set nails and screws, apply plain wood filler to indentations, sand smooth and leave ready to receive finish.

3.2 Erection

.1 Set and secure materials and components in place, rigid, plumb, and square.

.2 Provide heavy duty fixture attachments for wall mounted cabinet work.

.3 Provide solid and secure fastening of finish wood elements to rough blocking or other supporting material.

.4 Prepare external exposed and semi-exposed surfaces ready for painting.

.5 Apply bituminous coating over wood framing members in contact with masonry or cementitious construction.

3.3 Door Hardware

.1 Install hinges, latches and pulls and specified hardware at wood doors. Install using templates supplied by Hardware consultant; hang wood doors in specified frames; adjust for smooth free movement, free of binding. Ensure that all doors are properly balanced to close and do not ‘hang’ open.

.2 Install latches, locks, striker plates, pulls, pushes, closers, panic devices, etc., in pre-fabricated openings in steel doors and frames.

END OF SECTION 06200

PART 1 - GENERAL

1.1 Description of Work

The work shall consist of but not be limited to the following:

.1 Supply and installation of shop-fabricated window sills and all other similar and/or related millwork items shown on the Architectural drawings.

.2 Supply and installation of other countertops associated with millwork items in the specified materials [including those made of plastic laminate, solid surfacing, stainless steel, etc.] as specified on the Architectural drawings.

1.2 Related Work Specified Elsewhere

.1	Rough Carpentry	Section 06100
.2	Finish Carpentry	Section 06200
.3	Sealant	Section 07900
.4	Finish Hardware	Section 08710
.5	Glass & Glazing	Section 08800
.7	Painting	Section 09900
.10	Mechanical	Section 15000
.11	Electrical	Section 16000

1.3 Requirements of Regulatory Agencies

.1 All finishes shall meet the flame spread and smoke development requirements of the Ontario Building Code for the specific location and application for all parts of the Work.

1.4 Prevailing Performance Standard

.1 Notwithstanding information provided elsewhere herein, all millwork items supplied and/or installed by this Division are to be fabricated to the 'Custom Grade' standards outlined in the most current edition of the Architectural Woodwork Manufacturers Association of Canada (AWMAC) 'Architectural Woodwork Quality Standards' Guide prepared by the Architectural Woodwork Institute. This Guide is to be taken as the standard for fabrication of all items herein and shall be acknowledged by the Millwork Trade as a mandatory supplementary reference guide (in addition to this Specification) for the completion of all related work for this project.

1.5 Samples

.1 Submit duplicate 300mm x 300mm samples of each type laminate, melamine and solid surfacing material specified herein for Architect's approval prior to product ordering. All samples shall fully conform to the colours and finishes specified.

1.6 Shop Drawings

.1 Submit shop drawings in accordance with Section 01340.

.2 Clearly indicate details of construction, profiles, jointing fastening and other related details. All finishes to be noted respective to rooms and locations. Ensure that all millwork items bounding pieces of equipment are coordinated with actual equipment dimensions supplied by Owner.

1.7 Product Handling

.1 Cover finished laminated plastic surfaces with heavy kraft paper or put in cartons during shipment. Protect installed laminated surfaces by approved means.

.2 Do not store or install materials in areas where relative humidity is less than 25% or greater than 60% at 22°C (72°F).

1.8 Warranty

.1 Contractor hereby warrants that laminated plastic work, solid surface countertops, stainless steel countertops and melamine finish items will not warp, crack or delaminate for two years from the date of Occupancy.

PART 2 - PRODUCTS

2.1 Materials

.1 **Softwood Lumber:** to CSA 0141 and National Lumber Grades Authority requirements, with maximum moisture content of 6% for interior work. Pine species, to AWMAC custom grade for concealed framing.

.2 **Hardwood Lumber:** to National Hardwood Lumber Association (NHLA) requirements, moisture content of maximum 6% for interior work. Maple species, to AWMAC custom grade for all solids as detailed, including nosing and edging. Mill worker to select only clear, regular grained pieces, free of all knots, warps, splits, sapwood streaks and any visible irregularities. The Architect reserves the right to refuse any pieces deemed unsatisfactory for replacement to his satisfaction at no cost increase.

.3 **Hardwood Veneered Plywood:** to CSA 0115 in thicknesses indicated on drawings. Maple veneer on plywood core or on industrial grade particle board core having minimum 720 kg/m^3 (45 lb/cu. ft.) density and meeting CAN30 018801 M78. Grade "R" Maple veneer, free of visible irregularities including knots, grain worbles, heavily contrasting grain patterns etc. The Architect reserves the right to reject any pieces deemed unsatisfactory for replacement to his satisfaction at no cost increase.

.4 **Particle Board:** Laminated surfaces to have substrate of industrial grade particle board having minimum 720 kg/m^2 (45 lb/cu. ft) density and meeting CAN-3001881. Particle board thickness as noted on drawings.

.5 **Medium Density Fiberboard (MDF)**: MDF materials to conform to ANSI A208.2-2009 (Grade 155) with a density of 46 - 48 lbs/cubic ft. MDF thickness as noted on drawings. Product to be Uniboard Excel + Grade or approved alternate.

Where MDF is used in exterior applications and in interior applications subject to even infrequent water exposure, ensure use of Extirra water-resistant MDF throughout.

.6 **Solid Surfacing (SS):**

Solid surfacing material to be 1/2" thick throughout c/w built-up nosing profiles as indicated on architectural drawings.

Solid Surfacing to be
LG Hi-Macs 'Milky Way T009'

.7 Plastic Laminate Adhesive: contact adhesive to CGSB 71-GP-10M, or as per respective manufacturer's specifications.

.8 Nails and staples: to CSA B111, plain finish.

.9 Caulking/sealants for interior use in accordance with Section 07900.

PART 3 - EXECUTION

3.1 Fabrication of Solid Surfacing Countertops & Panels

.1 All solid surfacing countertop are to be fabricated in full accordance with the product manufacturer's fabrication guide (and related requirements therein) respective to the intended application. Particular attention should be paid to:

- provision of proper supporting substrates throughout
- provision of matching solid surfacing seam blocks at all joints in material
- provision of radiused inside blocks at all inside countertop corners
- provision of gaps between solid surface material and substrate to provide adequate allowance for thermal expansion and contraction, including use of manufacturer-recommended adhesives.

.2 All 'L-shaped' solid surface countertops must not be seamed on a 45° angle, but rather on an 'L-shaped' joint, with a min. 1" radius plus a 1" straight run at the inside corner, ensuring a 90° joint between adjacent surfaces. Consult manufacturer's fabrication guide for full requirements.

.3 Ensure provision of adequate support below all countertop cut-outs, and use of thermal isolation tape at any cut outs to accommodate heat generating equipment items.

.4 Ensure that all joints in solid surface materials are chemically welded with manufacturer-recommended colour-matching seaming adhesive. All joint seams are to be sanded and buffed smooth and co-planar throughout, free of perceptible lines and distinction between adjacent surfaces when complete.

.5 All solid surfacing used as wall and/or bulkhead facing are to be adhered to full plywood substrates in full accordance with the manufacturer's recommendations for the intended application, utilizing recommended products and techniques.

.6 Solid surfacing materials are to be left in natural 'matt' finish throughout and are not to be buffed to a higher sheen.

3.2 Trimwork Installation

.1 Set and secure all materials and components in place ensuring that they are plumb, true and square unless noted otherwise.

.2 All seams between adjacent trims in continuous run are to be mitred and overlapped. Glue and mechanically fasten joints to suit, filling and finishing to match specified trim finish. Ensure finished joints are flush and co-planar, free of gaps and visual irregularities.

.3 Joints at 90 degree corners are to be mitred to suit, unless otherwise noted. Ensure finished joints are flush and co-planar, free of gaps and visual irregularities.

END OF SECTION 06400

PART 1 - GENERAL

1.1 **General Requirements:**

.1 The General Conditions, the Supplementary Conditions, the Instructions to Bidders and Division One General Requirements shall be read in conjunction with and govern this section.

.2 The Specification shall be read as a whole by all parties concerned. Each Section may contain more or less than the complete work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their work.

1.2 **Description of Work:**

This division applies to the provision of 'air barriers, vapour barriers, moisture barriers, transition membrane' and similarly named membranes referred to on the Architectural drawings including (without strict limitation to) the following:

.1 Supply labour, materials, plant, tools and equipment to complete the Work as shown on the Drawings and as specified herein to bridge and seal the following air leakage pathways and gaps:
1. Connections of the walls to the roof air barrier.
2. Connections of the walls to the foundations.
3. Seismic and expansion joints.
4. Openings and penetrations of window and door frames, curtain wall etc.
5. Piping, conduit, duct and similar penetrations
6. Masonry ties, screws, bolts and similar penetrations.
7. All other air leakage pathways in the building envelope.

.2 Materials and installation methods of the primary air/vapour & rain barrier membrane system on applicable substrates, behind specified cladding materials.

.3 Materials and installation methods of damp-proof coursing and through-wall flashing membranes.

.4 Materials and installation methods for the adhesion of rigid and semi-rigid insulating materials.

1.3 **Related Sections:**

.1	Steel Doors:	Section 08100
.2	Aluminum Windows & Doors:	Section 08150

1.4 REFERENCES

.1 The following standards are applicable to this section:

.1 ASTM E2178: Standard Test Method for Air Permeance of Building Materials.

.2 ASTM E283: Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.3 E1677 Specification for Air Retarder (AR) Material or System for Low-Rise Framed Building Walls

.4 ASTM E330: Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

.5 ASTM E331: Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

.6 ASTM E96: Water Vapor Transmission of Materials.

.7 CGSB 37-GP-56M: Membrane, Modified, Bituminous, Prefabricated, and Reinforced.

.8 ASTM 2357 certifying the air leakage and vapour permeance rates for assembly.

1.5 Submittals

.1 Submit documentation from an approved independent testing laboratory certifying the air leakage rates of the air barrier membranes assembly, including primary membrane, adhesive, primer and sealants have been tested to meet ASTM E 2357. Submittal to include testing for both regular and low temperature grades on both porous and sheathing substrates.

.2 Submit documentation from an approved independent testing laboratory certifying the air leakage and vapour permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the Massachusetts Energy Code and in accordance with ASTM E2178.

1. Test report submittals shall include test results on porous substrate and include sustained wind load and gust load air leakage results.
2. Test reports to be provided for both regular and low temperature grades.

.3 Prior to commencing the Work, submit documentation from an approved independent testing laboratory certifying that the air leakage and vapour permeance rates of the air barrier membranes, including primary membrane and transition sheets, exceed the requirements of the National Building Code.

.4 Prior to commencing the Work submit copies of manufacturers' current ISO certification. Membrane, primers, sealants, adhesives and associated auxiliary materials shall be included.

.5 Prior to commencing the Work submit references clearly indicating that the membrane manufacturer has successfully completed projects on an annual basis of similar scope and nature for a minimum of fifteen years. Submit references for a minimum of ten projects.

.6 Prior to commencing the Work submit manufacturers' complete set of standard details for the air barrier membrane systems showing a continuous plane of air tightness throughout the building envelope.

.7 Prior to commencing work provide material checklist complete with application rates & minimum thickness of primary membranes.

1.6 Quality Assurance

.1 Submit in writing, a document stating that the applicator of the primary air/vapour barrier membranes specified in this section is recognized by the manufacturer as suitable for the execution of the Work.

.2 Perform Work in accordance with the manufacturer's written instructions of the air/vapour barrier membrane and this specification.

.3 Maintain one copy of manufacturer's written instructions on site.

.4 At the beginning of the Work and at all times during the execution of the Work, allow access to Work site by the air/vapour barrier membrane manufacturers' representative.

.5 Components used in this section shall be sourced from one manufacturer, including sheet membrane, air/vapour barrier sealants, primers, mastics and adhesives.

1.7 Mock-Up

.1 Construct mock-up in accordance with Section 01340 - Shop Drawings, Product Data, Samples and Mock-ups.

.2 Where directed by architect, construct typical exterior wall panel, 2 m long by 2 m wide, incorporating substrate, window frame, attachment of insulation, and showing air/vapour barrier membrane application details.

.3 Allow 48 h for inspection of mock-up by architect before proceeding with air/vapour barrier work. Mock-up may remain as part of the Work.

1.8 Delivery, Storage and Handling

.1 Deliver materials to the job site in undamaged and original packaging indicating the name of the manufacturer and product.

.2 Store role materials on end in original packaging.

.3 Store adhesives and primers at temperatures of 5 degrees C and above to facilitate handling.

.4 Keep solvent away from open flame or excessive heat.
.5 Protect rolls from direct sunlight until ready for use.

1.9 Co-ordination
.1 Ensure continuity of the air/vapour barrier membrane system throughout the scope of this section.

1.10 Alternates
.1 Submit requests for alternates in accordance with Section 01005.

.2 Alternate submission format to include:
.1 Submit evidence that alternate materials meet or exceed performance characteristics of Product requirements as well as documentation from an approved independent testing laboratory certifying that the air leakage and vapour permeance rates of the air/ vapour barrier membranes, including primary membrane and transition sheets, exceed the requirements of the National Building Code, ASTM E 2357, the Massachusetts Energy Code and in accordance with ASTM E 2178.
.2 Submit copies of the manufacturers' current ISO certification.
.3 Submit references clearly indicating that the membrane manufacturer has successfully completed projects on a annual basis of similar scope and nature for a minimum of fifteen years.
.4 Submit manufacturers' complete set of standard details for air/vapour barrier membrane systems showing a continuous plane of air tightness throughout the building envelope.
.3 Submit requests for alternates to this specification a minimum of ten (10) working days prior to tender closing for evaluation. Include a list of ten projects executed over the past ten years.
.4 Acceptable alternates will be confirmed by addendum. Substitute materials not approved in writing prior to tender closing shall not be permitted for use on this project.

1.11 Warranty
.1 Provide manufacturer's standard 5-year material warranty.

PART 2: PRODUCTS

2.1 Air/vapour barrier membrane components and accessories must be obtained as a single-source from the membrane manufacturer to ensure total system compatibility and integrity.

2.2 Membrane Manufacturer: **Henry-Bakor** or pre-approved alternate.

2.3 Membranes
.1 Primary sheet air/vapour barrier membrane shall be Blueskin® SA manufactured by Henry-Bakor, a SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film. For application temperatures down to -12°C use Blueskin® SA LT. Membrane shall have the following physical properties:
.1 Thickness: 1.0 mm (40 mils),
.2 Air leakage: <0.005 L/s.m² @ 75 Pa to ASTM E283-91,
.3 Tested to ASTM E 2357 for the air barrier assembly,
.4 Water vapour permeance: 1.6 ng/Pa.m².s (0.03 perms) to ASTM E96,
.5 Low temperature flexibility: -30 °C to CGSB 37-GP-56M,

.6 Elongation: 200% to ASTM D412-modifed.

.2 Through-wall flashing membrane and dampproof course (Self-Adhering) shall be Blueskin® TWF manufactured by Henry-Bakor, a SBS modified bitumen, self-adhering sheet membrane complete with a cross-laminated polyethylene film, having the following physical properties:
.1 Colour: Yellow,
.2 High Temperature Stability: 110 degrees C min. to ASTM D5147 (resistance to flow)
.3 Thickness: 1.0 mm (40 mils),
.4 Air leakage: <0.005 L/s.m² @ 75 Pa to ASTM E283-91,
.5 Water vapour permeance: 1.6 ng/Pa.m².s (0.03 perms) to ASTM E96,
.6 Low temperature flexibility: -30 °C to CGSB 37-GP-56M.

.3 Primary water resistive air barrier membrane and window flashing on plywood backing shall be BlueskinVP 160 manufactured by Henry; a self-adhering reinforced modified polyolefin tri-laminate (Blue) sheet air barrier membrane for wall construction, specifically designed to be water resistant and vapour permeable. Patented adhesive backing to be protected with a 2 piece release film. Membrane shall have the following physical properties:
.1 Air leakage: <0.02L/s/m² @ 75Pa [<0.004 CFM/ft² @ 1.57 lbs/ft²] when tested in accordance with ASTM E 2178.
.2 Water Vapour Permeance: 1658 ng/Pa.m².s (29 perms) to ASTM E96, Method B – Desiccant Method.
.3 Tested to ASTM E 2357 for Air Leakage of Air Barrier Assemblies.
.4 Resistance to Water Penetration: Pass ICC-ES AC 38.
.5. Water Penetration Resistance around Nails: Pass when tested to AAMA 711-05 & ASTM D 1970 modified.
.6 Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84: Flame Spread Rating of 0 and Smoke Development Classification of 105.
.7 Basis Weight: 120 g/m², when tested in accordance with TAPPI Test Method T-410.
.8 Tensile Strength: 182N MD and 129N CD per ASTM D828.
.9 Average Dry Breaking Force: 565N MD, and 405N CD per ASTM D 5034.
.10 Cyclic and Elongation: Pass at 100 cycles, -29 deg C. (-20 deg F.) per ICC-ES AC 48.

2.4 Adhesive and Primers
.1 Adhesive for self-adhering membranes at temperatures above -12°C shall be Blueskin® Adhesive manufactured by Henry-Bakor, a synthetic rubber based adhesive, quick setting, having the following physical properties:
.1 Colour: Blue,
.2 Weight: 0.8 kg/l,
.3 Solids by weight: 35%,
.4 Drying time (initial set): 30 minutes.
.2 Primer for self-adhering membranes at temperatures above –4 degrees C shall be Aquatac™ Primer manufactured by Henry-Bakor, a polymer emulsion based adhesive, quick setting, having the following physical properties:
.1 Colour: Aqua,
.2 Weight: 1.0 kg/l,
.3 Solids by weight: 53%,
.4 Water based, no solvent odours,
.5 Drying time (initial set): 30 minutes at 50%RH and 20 degrees C.

.3 Adhesive for self-adhering membranes at temperatures above -12°C shall be Blueskin® LVC Adhesive a quick drying, lower volatile organic compound (VOC) formulation, rubber based adhesive designed to enhance the adhesion of self-adhesive membranes such as **Blueskin®**
.1 Colour: Blue

.2 Weight: 0.9 kg/l
.3 Solids By Weight: 40%
.4 VOC Content: < 250 g / L
.5 Drying Time (initial set): Approximately 30 minutes.

2.5 Mastics & Termination Sealants

.1 Liquid air seal mastic and insulation adhesive shall be Air-Bloc 21 or 230-21 Insulation Adhesive manufactured by Henry-Bakor, a synthetic, trowel applied, rubber based adhesive, having the following characteristics:
.1 Compatibility: With air/vapour barrier membrane, substrate and insulation.
.2 Air leakage: 0.013 L/s.m² @ 100 Pa.,
.3 Water vapour permeance: 1.7 ng/Pa.m².s. (0.03 perms),
.4 Long term flexibility: CGSB 71-GP-24M,
.5 Chemical resistance: Alkalis and salt.

.2 Termination Sealant shall be HE925 BES Sealant manufactured by Henry-Bakor, a moisture cure, medium modulus polymer modified sealing compound having the following physical properties:
.1 Compatible with sheet air barrier, roofing &waterproofing membranes and substrate,
.2 Complies with Fed. Spec. TT-S-00230C, Type II, Class A,
.3 Complies with ASTM C 920, Type S, Grade NS, Class 25,
.4 Elongation: 450 – 550%,
.5 Remains flexible with aging,
.6 Seals construction joints up to 25mm wide.
.7 For use in concealed or exposed application.

.3 Termination Sealant shall be POLYBITUME® 570-05 Polymer Modified Sealing Compound manufactured by Henry-Bakor, a polymer modified sealing compound having the following characteristics:
.1 Compatible with sheet waterproofing membrane and substrate,
.2 Solids by volume: 70%,
.3 Vapour permeance: 2.9 ng/Pa.m².s, ASTM E96,
.4 Complies with CGSB 37.29,
.5 Remains flexible with ageing,
.6 Chemical resistance: Alkalis, calcium chloride, mild acid and salt solutions.

PART 3: EXECUTION

3.1 Examination

.1 Verify that surfaces and conditions are ready to accept the Work of this section. Notify consultant in writing of any discrepancies. Commencement of the work or any parts thereof shall mean acceptance of the prepared substrate.
.2 All surfaces must be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill spalled areas in substrate to provide an even plane. Strike masonry joints flush.
.3 New concrete should be cured for a minimum of 14 days and must be dry before air/vapour barrier membranes are applied.
.4 Where curing compounds are used they must be clear resin based without oil, wax or pigments.

3.3 Adhesive or Primer for Transition and Through-wall Flashing Membrane (Self-Adhering)

.1 Apply adhesive or primer for self-adhering membranes at rate recommended by manufacturer.

.2 Apply to all areas to receive transition sheet and / or through-wall flashing membrane, as indicated on drawings by roller or spray and allow minimum 30 minute open time. Surfaces not covered by self-adhering transition membrane or self-adhering through-wall flashing membrane during the same working day must be re-applied.

3.4 Transition Membrane (Self-Adhering)

.1 Align and position self-adhering transition membrane, remove protective film and press firmly into place. Ensure minimum 50 mm overlap at all end and side laps.

.2 Tie-in to window frames, aluminium screens, hollow metal doorframes, spandrel panels, roofing system and at the interface of dissimilar materials as indicated in drawings

.3 Promptly roll all laps and membrane with a counter top roller to effect seal.

.4 Ensure all preparatory work is complete prior to applying liquid applied air vapour barrier membrane.

3.5 Through-wall Flashing Membrane & Dampproof Course (Self-Adhering)

.1 Apply through-wall flashing and dampproof coursing membrane in accordance with CSA A371-94 Masonry Construction for Buildings; along the base of masonry veneer walls, over windows, doors and other wall openings required to be protected.

.2 Applications shall form a continuous flashing membrane and shall extend up a minimum of 200 mm up the back-up wall.

.3 At the end of each days work seal the top edge of the membrane where it meets the substrate using liquid air seal mastic. Trowel apply a feathered edge to seal termination and shed water.

.4 Ensure through-wall flashing membrane extends fully to the exterior face of the exterior masonry veneer. At locations where flashing terminates or intersects wall openings including door frames, “end dam” flashing to protect openings and redirect water out. Trim off excess as directed by the consultant.

.5 Apply dampproof coursing membrane over slabs on grade, prepare and prime surfaces, align and position membrane between slab and masonry block work.

.6 Align and position the leading edge of self-adhering through-wall flashing membrane with the front horizontal edge of the foundation walls, self angles and other substrates to be protected, partially remove protective film and roll membrane over surface and up vertically.

.7 Press firmly into place. Ensure minimum 50 mm overlap at all end and side laps. Promptly roll all laps and membrane to affect the seal.

.8 Ensure all preparatory work is complete prior to applying self-adhering through-wall flashing membrane.

.9 Ensure through-wall flashing membrane extends fully to the exterior face of the exterior masonry veneer. Trim off excess as directed by the consultant.

3.6 Air/Vapour Barrier Membrane

.1 Apply self-adhering membrane complete and continuous to prepared and primed substrate in an overlapping shingle fashion and in accordance with manufacturer's recommendations and written instructions. Stagger all vertical joints.

.2 Align and position self-adhering membrane, remove protective film and press firmly into place. Ensure minimum 50 mm overlap at all end and side laps. Promptly roll all laps and membrane with a counter top roller to affect the seal.

.3 At the end of each days work seal the top edge of the membrane where it meets the substrate using liquid air seal mastic. Trowel apply a feathered edge to seal termination and shed water.

.4 Tie-in to window frames, aluminium screens, hollow metal doorframes, spandrel panels, roofing

system and at the interface of dissimilar materials as indicated in drawings. Refer to manufacturers' standard details.

.5 Ensure all projections, including wall ties, are properly sealed with a caulk application of liquid air seal mastic.

.6 Mechanically fasten membrane through securement bars to all window, door, louvers and curtain wall sections as recommended by membrane manufacturer where proper adhesion and bonding cannot be maintained.

.7 Membrane applied to the underside of substrate surfaces shall receive special attention on application to ensure maximum surface area adhesion is obtained.

3.7 Installation of Insulation

.1 Co-ordinate with Cavity Wall Insulation Section 07216 for insulating materials.

.2 Upon the curing of the air/vapour barrier membrane system apply the liquid air seal mastic and insulation adhesive in a serpentine pattern over completed air/vapour barrier membrane system.

.3 Immediately embed insulation into the adhesive and press firmly into place to ensure full contact. Apply additional adhesive if allowed to skin over.

.4 Fully butter all joints of insulation panels with adhesive during installation, except at expansion joints.

3.8 Inspection

.1 Notify consultant when sections of work are complete so as to allow for review prior to installing insulation.

3.9 Protection of Finished Work

.1 Air-Bloc and Blueskin® membranes are not designed for permanent exposure. Product designed to withstand reasonable job site exposure, however good practice calls for covering as soon as possible.

.2 Damp substrates must not be inhibited from drying out. Do not expose the backside of the substrate to moisture or rain.

.3 Cap and protect exposed back-up walls against wet weather conditions during and after application of membrane. Drying time varies depending on temperature and relative humidity.

.4 Air barrier membranes are not designed for permanent exposure. Good practice calls for covering as soon as possible.

END OF SECTION 07261

PART 1 - GENERAL

1.1 General

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

1.2 Description of Work

Provide all labour, materials, and equipment required or called for in this specification, or which is necessary, to complete the work without any extra cost. This work may require any or all, but not be limited to any of the following:

1.3 Related Work

Shall include the following but not limited to:

.1	Architectural Woodwork	Section 06400
.2	Steel Doors & Frames	Section 08100
.3	Aluminum Windows	Section 08150

1.4 Environmental Conditions

.1 Sealant and substrate materials to be at temperature recommended by manufacturer for each type of sealant.

1.5 Samples

.1 Submit samples, in accordance with Section 01340, of each specified type of compound to be used together with the recommended primers and joint filler proposed to be used.

Provide samples of available colours for selection by the Architect.

1.6 Warranty

.1 Contractor hereby warrants that caulking work will not leak, crack, crumble, melt, shrink, run, loose adhesion, or stain adjacent surfaces for three years.

1.7 Qualifications

.1 Only skilled and experienced tradesmen shall carry out the work in this section.

.2 Report to the Architect any discrepancies or unclear items.

PART 2 - PRODUCTS

2.1 Materials

.1 Primers: type recommended by sealant manufacturer.

.2 Joint Fillers:

(a) General: compatible with primers and sealants, outsized 30% to 50%.
(b) Polyethylene, urethane, neoprene or vinyl: extruded closed cell foam, Shore A hardness 20, tensile strength 140 to 200 kPa.

(c) Neoprene or butly rubber: round solid rod, Shore A hardness 70.
(d) Polyvinyl chloride or neoprene: extruded tubing with 6mm minimum thick walls.

.3 Bond breaker: pressure sensitive plastic tape, which will not bond to sealants.

.4 Joint cleaner: xylol, methylethyleketon or non-corrosive type recommended by sealant manufacturer and compatible with joint forming materials.

.5 Vent tubing: 3mm inside diameter extruded polyvinyl chloride tubing.

.6 Sealants:
(a) General Exterior Sealant: single component polyurethane base sealant to meet C.G.S.B. Specification 19GP5M and CAN 2-19-24-M90 such as Sikaflex 1A, Dymeric by Tremco, or approved alternate.
(b) General Interior Sealant: single component sealant to meet C.G.S.B. specification 19GP17M and which can be painted, such as Tremflex 834 by Tremco, an approved alternate.
(c) Rubber asphalt sealing compound: one component, black rubberized asphalt: Bakor "570-05".
(d) High humidity sealant: one component, coloured, mildew resistant, silicone; Dow "786".
(e) Isolation paint: black asphaltic bitumastic paint; Bakor "410-02" or Domtar "Ace of Spades".

2.2 Preparation

.1 Remove dust, paint, loose mortar and other foreign matter. Dry joint surfaces.

.2 Remove rust, mill scale and coatings from ferrous metals by wire brush, grinding or sandblasting.

3 Remove oil, grease and other coatings from non-ferrous metals with a compatible cleaner.

.4 Prepare concrete, masonry and glazed surfaces to sealant manufacturer's instructions.

.5 Examine joint sizes; minimum width of 6mm (1/4"); maximum width 25mm (1").

.6 Install joint filler to achieve correct joint depth to width ratio; minimum depth 1/2 width. Joint filler shall be oversized to remain under 25% compression within the joint, at minus 7 degrees C (20 degrees F.); set back in joint to achieve depth to width ratio as above.

.7 Where necessary to prevent staining, mask adjacent surfaces prior to priming and caulking.

.8 Apply bond breaker tape where required to manufacturer's instructions.

.9 Prime sides of joints in accordance with sealant manufacturer's instructions immediately prior to caulking.

2.3 Application

.1 Apply sealants, primers, joint fillers and bond breakers to manufacturer's instructions and as required by job conditions.

.2 Coordinate with work of other sections to determine correct position of sealant application in sequence of work.

.3 Apply sealants using gun with proper size nozzle. Shape nozzle so as to finish sealant in a neat concave bead.

.4 Use sufficient pressure to fill voids and joints solid. Superficial pointing with skin bead is not acceptable.

.5 Exposed sealant shall be smooth, free from ridges, wrinkles, sags, air pockets and embedded impurities.

.6 In masonry cavity construction, vent caulked joints from cavity to 3 mm beyond external face of wall by inserting vent tubing at bottom of each joint and maximum of 1500 mm (5') oc vertically. Position tube to drain to exterior.

.7 Remove excess sealant and droppings using a recommended cleaner without damaging finished surfaces. Remove masking after tooling joints.

2.4 Schedule of Projections

Materials and application to be in accordance with manufacturer's recommendations and verified by their technical representative.

.1 General exterior sealant: joints between exterior metal door frames and masonry; joints between window frames and siding control and expansion joints; sealing of joints between underside of concrete floor slabs and masonry; continuously at underside of metal sills; around all projections through exterior wall, hose bibs, pipes and the like; around all metal louvers; as per drawings and not necessarily covered herein; locations not filled with trim.

.2 General Interior Sealant: joints between door frames and masonry; masonry control and expansion joints; between built-in architectural woodwork and adjacent surfaces; control joints in gypsum board assemblies above suspended ceilings where pipes, ducts or other mechanical equipment passes through walls; at any other location indicated on drawings but not described herein; locations not covered by trim; at window sills and all toilet bases.

.3 Rubber-Asphalt Sealant: around penetrations in foundation wall damp proofing; between roof sleeves and pipes, conduits, etc., penetrating roof; as bed for and between joints in concealed metal flashing; between sheet damp proofing and adjacent concrete and masonry surfaces; etc.

.4 High Humidity Sealant: joints between plumbing fixtures and surrounding material; joints between mirrors and metal fixtures; etc.

.5 Isolation paint: back priming of metal flashing; coating aluminum frame and structural components in contact with steel or masonry; priming of metal components built into roof assembly; etc.

END OF SECTION 07900

PART 1 - GENERAL

1.1 General

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

1.2 Description of Work

The work shall consist of the following but not limited to:

.1 Fire-rated and non-rated steel doors, door frames, glazing screens and hollow metal transom panels as indicated on the drawings.

.2 Prepare frames with continuous bar reinforcement at head of frames for door closures.

.3 Prepare frames with continuous bar reinforcement at jambs of frames for continuous piano hinges as shown on Door and Frame schedule.

.4 Prepare frame and doors to receive electrical wiring and control switches for barrier-free door operators supplied by other sections.

.5 Prepare frames and doors for intrusion alarms.

.6 Prepare doors as required to receive electrical wiring for door strikes for card access system.

.7 All steel frames shall be metric sized for metric concrete block coursing unless noted or required otherwise.

.8 Steel frame sizes and configurations shall be as indicated in the Door and Frame Schedule Drawings.

1.3 Related Work

.1	Finish Carpentry	Section 06200
.2	Finish Hardware	Section 08710
.3	Sealants	Section 07900
.4	Glazing	Section 08800
.5	Painting	Section 09900

1.4 Requirements of Regulatory Agencies

.1 Fabrication and installation of steel doors and frames is to be in accordance with Canadian Steel Door and Frame Manufacturers' Association, "Canadian Manufacturing Specifications for Steel Doors and Frames", (most current edition) except where specified otherwise.

.2 Fabrication and installation of fire rated steel doors and frames is to be in accordance with the requirements of NFPA-80. Rated doors and frames are to carry ULC Labels, permanently anchored; unlabelled units will be rejected.

1.5 Shop Drawings

.1 Submit shop drawings in accordance with Section 01340.

.2 Indicated each type of door and frame, fire rating, material, core type and thickness, mortices and reinforcements, location of anchors and exposed fasteners, arrangement of hardware, openings, glazing stops and finishes.

.3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule.

PART 2 - PRODUCTS

All material notations provided below reflect minimum acceptable standards. For all fire-rated products, suppliers are to provide items fully achieving required/noted fire-resistance ratings. Modify and upgrade material gauges, material composition, fabrication techniques etc. as required to achieve specified ratings (noted on drawings and/or in Door Schedule) in accordance with hollow-metal manufacturer options and offerings.

2.1 Manufacturers

.1 Fleming, Assa Abloy, Macotta, Vision or approved alternate.

2.2 Materials Steel Frames

.1 Sheet steel: commercial grade steel W25 wiped zinc finish.

(a) Frames: 1.5 mm (16 U.S. std. ga.) base thickness steel.
(b) Floor anchors, channel spreaders and wall anchors: minimum 1.5 mm (16 ga.) base thickness steel.
(c) Guard boxes: minimum 0.8 mm (22 ga.) base thickness steel.
(d) Glazing stops: minimum 1.0 mm base thickness steel, screw fixed tamperproof (19 ga.)
(e) Hardware reinforcing: 6 mm (1/4") steel plate.

.2 Reinforcing channel: 100 x 40 mm (C4 x 6.25).

.3 Door bumpers: black neoprene double stud

.4 Primer: to CGSB 1-GP.

.5 Anchors: Wire "T" masonry or welded in UL type.

2.3 Materials Steel Doors

.1 **Exterior Hollow Doors and Hollow Metal Transom Panels:** Sheet Steel: 1.5 (16 ga.) base thickness, commercial grade steel with exterior-application premium zinc finish.

.2 Glazing and panel stops: minimum 1 mm (19 ga.) base thickness sheet steel with wiped zinc finish; tamperproof, screw fixed.

.3 Top and bottom channels: 1.5 mm (16 ga.) galv. steel channels.

.4 Reinforcing: hinges, 5 mm (6ga.): Lock and flush bolt 3 mm (10 ga.); surface hardware 1.5 mm (16 ga.)

.5 Primer: for touch up to CGSB 1-GP.

2.4 Fabrication Frames

.1 Form profiles accurately to approved shop drawings, free of kinks, twists and warps.

.2 Cut mitres and joints accurately and weld continuously on inside of frame profile. Where site welding or splicing is required due to size of unit, location of field joints shall be shown on Shop Drawings and strictly adhered to; avoid field welding where possible.

.3 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.

.4 Mortice, reinforce, drill and tap fames to receive templated strikes, butt hinges, and continuous piano hinges; check Hardware Schedule for requirements. Manufacturer to make allowance for morticed hardware.

.5 Weld guard boxes to frame at all strikes, hinges and concealed closers to completely enclose same.

.6 Install stiffener plates or spreaders between frame trim where required to prevent bending of trim and to maintain alignment when setting and during adjacent construction work.

.7 Provide 1.5 mm (1/16") clearance at head and jambs, and no more than 9mm (3/8") at floor. Provide clearance for intended finish flooring. Locate top hinges with top 125 mm (5") below door top, bottom hinges with bottom 250 mm (10") from floor, and intermediate hinges equi-distant between top and bottom hinges.

.8 Provide adjustable "T" anchors or welded in UL type anchors for each jamb at approximately 600 mm (2'-0") centres. Provide floor anchors on frames that terminate at finished floor. Provide jamb extension anchorage on frames that terminate at slab.

.9 Provide two welded-in channel or angle spreaders per door frame at bottom to ensure frame alignment.

.10 Reinforce head of frames over 1200 mm (4') in width. Reinforce jambs of frames over 2400 mm (8') in height or where frame heads are unsupported by adjacent material; install reinforcing continuous from floor to structure above.

.11 Install 3 bumpers on strike jamb for each single door and 2 bumpers at head for pairs of doors.

.12 Construct thermally broken frames with continuous polyvinylchloride thermal breaks between inner and outer portions of frame.

.13 Provide glazing stops in all areas requiring glass or panels, as indicated; stops to be on interior side of exterior frames.

.14 All frames shall be bonderized and receive one coat of baked on rust inhibitive primer.

.15 Install all glass with isolation and glazing tapes to suit, included any and all related fabrication techniques or accessories required to achieve specified fire-resistance ratings.

2.5 Fabrication-Doors

.1 Doors shall be of hollow metal construction reinforced and stiffened with sound deadening kraft honeycomb, or rigid polyurethane insulation cores. Laminate core to both inside faces of the panels.

.2 Doors shall be flush with no face seams. Doors shall have vertical mechanically interlocking seams.

16 gauge exterior doors shall be continuously welded and seam filled on both hinge and lock edges.

18 gauge interior doors shall be welded at 6” centres minimum and seam filled on both hinge and lock edges.

.3 Mortice, reinforce, drill and tap doors and reinforcements to receive hardware using templates provided by Finish Hardware supplier. Manufacturer to make allowance for morticed hardware.

.4 Make provision for glazing as indicated and provide necessary glazing stops. Stops on interior side of exterior doors.

.5 Doors shall be cleaned and sanded, given a coat of air drying past filler, again sanded to eliminate all unevenness or irregularities and given a baked on coat of rust-inhibitive primer.

.6 Install all glass in doors with isolation and glazing tapes to suit, included any and all related fabrication techniques or accessories required to achieve specified fire-resistance ratings.

PART 3 - EXECUTION

3.1 Frames

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure frames and screens to floor construction with two fasteners at each jamb, and set and brace them securely to maintain true alignment until built-in.

.3 Install temporary horizontal wood spreaders at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built in.

.4 Make allowance for deflection to ensure structural loads are not transmitted to frames.

.5 Install labeled fire rated frames with anchorage as required by NFPA-80.

3.2 Doors

.1 Install hollow metal doors complete with hinges as supplied under the work of Section 08710.

.2 Install doors only when work has progressed to a stage when no damage will occur to them in place.

3.3 Adjusting and Cleaning

.1 Hang doors to swing easily and freely on their hinges, to remain stationary in any position and to close tightly and evenly on frames without binding.

.2 Refinish damaged and defective work before completion of project.
Refinishing of exposed surfaces shall show no discernible variation in appearance.

END OF SECTION 08100

PART 1 - GENERAL

1.1 General

.1 Division One, General requirements, is part of this Section and shall apply as if repeated herein.

1.2 Description of Work

The intent of this project is the replacement of existing windows, curtain wall, doors and associated framing as/where noted in the Architectural drawings. Replacement items are to be fitted into existing openings throughout. All existing windows, entry systems and/or framing systems being replaced are to be removed complete with all associated existing items mounted thereon including [without strict limitation to]:

- existing window-mounted air-conditioning units
- existing window-mounted air conditioner brackets
- existing electrical conduit and associated items
- existing window blinds
- existing louvres [in window frames]
- miscellaneous existing items

The work shall consist of the following but not limited to:

.1 The coordinated removal of all existing curtain wall, windows, and related items specified to be replaced as part of the scope of work, including coordination with the Owner and/or school Principal to plan and phase this work cooperatively with the ongoing operation of the school facility.

Plan and coordinate all removal/replacement activities accordingly to optimize the ongoing function of the school and to minimize adverse impact on adjacent occupied spaces.

Ensure that the phased removal and replacement of windows and related curtain wall items is limited to a maximum of 4 rooms at a time, selected and determined in coordination with the school Principal. Undertake and complete window replacement in each room as soon as possible to ensure its prompt return to use.

.2 The investigation of all existing site and building conditions as they affect this scope of work, allowing for same herein, and ensuring that they factor into the pricing and related execution of this work.

.3 The on-site surveying of all dimensions related to architectural and other building features within and around curtain wall openings they impact the dimensions and of new curtain wall assemblies. All such detailed dimensions are to be reflected in the shop drawings at the time of their submission to the Architect.

.4 The disposal of all existing windows, curtain wall and related items being removed and replaced as part of this Division.

All such items removed as part of this contract shall be offered to the Building Owner for first right of refusal. All remaining items are to be disposed of under this contract at an approved sanitary landfill or recycling site capable of accommodating the related construction waste materials.

.5 The supply and installation of all thermal aluminum-framed window and entryway systems [including doors] with related components and accessories (as specified/as applicable) for a complete system including (without strict limitation to): aluminum framing components (including both fixed and operable sash), glazed vision panes, spandrel units, insulated back-pans behind spandrel panels, window screens, caulking within and around the window system, aluminum sills, all required anchorage components, fasteners, attachments, concealed interior (structural steel) reinforcing, shims, perimeter weather seals and all other items called for and/or as required as part of this scope of work.

.6 The supply and installation of tarping, boarding and any other temporary means required to ensure the water-resistance of the building envelope for all areas under construction affected by/related to the scope of work covered herein.

.7 The supply and installation of all aluminum clad column covers (ACC) noted throughout architectural drawings.

.8 The supply and installation of all metal panels (MP) in doors as noted throughout the architectural drawings.

1.3 Related Work

.1	Final Cleaning	Section 01710
.2	Rough Carpentry	Section 06101
.3	Sealants	Section 07900
.4	Glass & Glazing	Section 08800

1.4 Sub-Trade Quality Assurance

.1 Minimum Qualification for Successful Trade: The work of section shall be supplied, fabricated and installed by a company which has a minimum of 5 years of experience in the successful completion of projects of a similar size, design and quality, with a workforce of skilled personnel to complete the work in an efficient, professional and first-quality manner. The size of the Sub-Trades workforce will be critical for the timely execution of project requirements.

General Contractors are responsible to ensure at the time of Tender that their Sub-Trade executing this component of the work complies with these minimum requirements. Following project award, the Contractor may be required to provide written proof of this qualification, relative to the Sub-Trade being carried, as well as a written outline of the workforce (installation crew) being committed to this project.

1.5 Reference Standards

.1 Aluminum Association (AA):

a) DAF 45 [2003], Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA):

a) AAMA-501-[2005], Methods of Test for Exterior Walls.

b) AAMA-2603-[2002], Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

c) AAMA-2604-[2005], Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

d) AAMA-2605-[2005], Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

e) AAMA CW DG-1-[96], Aluminum Curtain Wall Design Guide Manual.

f) AAMA CW-10-[2004], Care and Handling of Architectural Aluminum From Shop to Site.

g) AAMA CW-11-[1985], Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.

h) AAMA-TIR A1-[2004], Sound Control for Fenestration Products.

.3 ASTM International (ASTM):

a) ASTM A653 / A653M – [09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

b) ASTM B209-[07], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

c) ASTM B221-[08], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

d) ASTM C612 – [09], Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

e) ASTM E283-[04], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

f) ASTM E331-[00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

g) ASTM E413 – [04], Classification for Rating Sound Insulation.

h) ASTM E1105 – [00(2008)], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.5 Canadian General Standards Board (CGSB):

a) CAN/CGSB-12.8-[97], Insulating Glass Units.

b) CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

c) CAN/CGSB-19.13-[M87], Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.6 CSA International (CSA):

a) CAN/CSA-S157-[2005], Strength Design in Aluminum.

b) CAN/CSA-S136–[2007], North American Specification for the Design of Cold-Formed Steel Structural Members.

c) CAN/CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.

.7 Environmental Choice Program (ECP):

CCD-45-[1995], Sealants and Caulking Compounds.

.8 Underwriter's Laboratories of Canada (ULC):

AN/ULC-S710.1 [2005], Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials.

1.6 Samples & Submittals

.1 **<u>Manufacturer's Certification:</u>**

Submit a letter from the manufacturer (on window manufacturer's letterhead) certifying that the subcontractor who has issued a purchase order, letter of intent or otherwise has entered into contract with the manufacturer to supply and install the related product. The letter must be dated and include the:

- Name and Contact Info of the Manufacturer
- Name of the project
- Name of the approved sub-contractor
- Complete list of product materials, components and accessories to be incorporated into the work including names, types and series numbers of all items being installed

- Manufacturer's Representative serving as contact for this project with telephone, fax and email numbers/addresses.

Submit this certification prior to the preparation of shop drawings.

.2 Submit to the Architect (upon his request) one representative sample mock-up of typical aluminum window assembly, complete with mullion types, vision glass, spandrel panel, insulated back-pan, weep-drainage system, attachments, anchors, caulking system and any other items comprising the full system specified herein.

.3 Submit to the Architect duplicate samples (12" x 12" size) of all prefinished aluminum colours to be utilized on the project. No related items are to be ordered without written sample approval from the Architect.

.4 Submit to the Architect duplicate samples (12" x 12" size) of all hermetic vision pane types, all spandrel panel types and all specialty ventilator units to be utilized on the project. No related items are to be ordered without written sample approval from the Architect.

1.7 Shop Drawings

.1 Submit shop drawings of all windows and curtain-wall items, clearly indicating opening sizes, materials and details for head, jamb and sill, profiles of components and elevations of units, structural or reinforcing members, anchoring details, description of related components and exposed finishes and fasteners, all in accordance with Section 01340.

.2 Submit with shop drawings **a letter from the identified manufacturer certifying that the details shown on the shop drawings accurately depict the identified manufacturers products**. The letter must be dated and include the:

- Name of the project
- Name of the sub-contractor
- Manufacturers contact with telephone and telefax numbers

Submit this certification with shop drawings.

.3 Submit one representative sample model and one corner cross section of each type of window, showing sill and jamb section, complete with hardware, weather stripping, glass, screening, etc., and other items to be used at the windows, including finishes.

1.8 Test Reports

.1 Submit test reports from independent testing agency indicating that windows exceed the performance requirements of CAN/CSA-A440 or equal at the appropriate performance levels to meet climatic requirements, and as specified herein, resistance, thermal performance, ease of operation, load tests on screen, blocked operation.

Submit a letter or certificate from aluminum profile extruder that the aluminum alloy is 6063 and has been heat treated to T6 temper.

.2 Submit test reports showing compliance of curtain wall system with specified performance characteristics and physical properties including air-infiltration, water infiltration and structural performance.

.3 Submit test reports verifying that insulated glazing vision panes used in curtain wall system comply with specified thermal standards.

1.9 Administrative Requirements

.1 Coordination with Trades: Coordinate work of this Section with work of other trades and for proper timing and sequence to avoid construction delays.

.2 Project/Site Meetings: Comply with other Sections herein relative to periodic attendance at site meetings as required. Ensure availability of manufacturer's Technical Representative to provide technical input as required.

.3 Manufacturer's Field Reports: Curtain Wall manufacturer to provide Site Reports in accordance with Section 3.4 Field Quality Control later herein. Copies of Field Reports are to be submitted directly to the Architect within 3 days of representative's visit and site inspection.

1.10 Maintenance

.1 Provide maintenance data for cleaning and maintenance of aluminum finishes and curtain wall systems for incorporation into maintenance manual specified in Section 01730.

1.11 Delivery, Storage & Handling

.1 Delivery and Acceptance Requirements:
- deliver material in accordance with Section 01600
- deliver aluminum framing and glazing materials and related components in manufacturer's original packaging with identification labels in tact and on products sized to suit project requirements

.2 Material Handling and Storage: to AAMA CW-10.

.3 Storage and Handling Requirements:
Store materials off of ground and protected from exposure to harmful weather conditions, and keep within temperature ranges recommended by manufacturer.

.4 Waste Management Requirements:

a) Separate and recycle or dispose of packaging material waste by an approved method as outlined related Sections elsewhere herein.
b) Separate and recycle or dispose of waste construction items by an approved method as outlined in related Sections elsewhere herein.

1.12 Warranty

.1 Provide written joint warranty between the General Contractor and window manufacturer stating that finished/assembled curtain wall, window, glazing screens and aluminum doors and frames are guaranteed against defects and malfunction under normal usage for a period of 5 years from date of Substantial Performance, including insulated glazing units. Warranty to be provided by Manufacturer(s) in writing, and executed by an authorized company official. This written warranty is in addition to and not intended to limit other rights which the Owner may have under any other Contract conditions or provisions.

PART 2 - PRODUCTS

2.1 Materials

.1 **Acceptable Manufacturers:**
Product shall be as manufactured by Alumicor, OldCastle Building Envelope. Alternate products will be reviewed if submitted during tender period and may be approved if criteria is met by architect.

.2 **Design Criteria:**

a) Products to be designed to AAMA CW-DG-1
   - design windows according to rainscreen principles
   - ensure horizontal members are sealed to vertical members to form individual compartments in accordance with rainscreen principles
   - ventilate and pressure-equalize air space outside exterior surface of insulation to the exterior
b) Design Aluminum components to CAN/CSA S157.
c) Design and window components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of wall using design pressure of 0.95 kPa (20psi) to AAMA CW11/ASTM E330.
d) Design window systems for thermal expansion and contraction caused by cycling temperature range of 95 degrees C (surface temperature of system components) over a 12-hour period without causing detrimental effect to interior or exterior system components.

   Ensure systems are able to withstand a temperature differential of 85 degrees C (ambient environmental temperature) without any adverse effect on system components and no deterioration of seals.

e) Design vertical expansion joints with baffled overlaps and compressed resilient air seal laid between mullion ends.

f) Ensure system is designed to accommodate:
- movement within window wall assembly
- movement between system and perimeter framing components
- dynamic loading and release of loads
- deflection of structural support faming
- shortening of building concrete structural columns
- creep of masonry, steel and concrete building components
- mid-span slab deflections
- action of door hardware and related items attached to aluminum framing members

g) Limit mullion deflection to prevent breakage of glass and to ensure maximum recovery of all materials.

h) Deadload prevention: design curtain wall system with separate, integrated support for insulating glass units.

i) Size all glass units to CAN/CGSB-12.20

j) Flatness criteria: 6mm max. in 6 m run for each panel

k) Air Infiltration: 0.63 cfm maximum of wall area to AAMA 501, ASTM E283 at differential pressure across assembly of 0.044 psi.

l) Water Infiltration: None to AAMA 501, ASTM E331, ASTM E1105 at differential pressure assembly of 0.104 psi.

m) Interior surfaces shall have no condensation before exposed edges of sealed units reach dew point temperatures during testing to AAMA 501.

n) Maintain continuous air-barrier and vapour-retarder throughout building envelope and curtain wall assembly.

o) Ensure no vibration harmonics, wind whistles, noises caused by thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or system components occur.

.3 **ALUMINUM-FRAMED WINDOWS (W-#):**

All **fixed sash** in aluminum framed windows tagged as W/# to be:

Model 1200-6-AR Series, fixed window units having a (6") deep frame with thermal break to CAN/CSA-A440, performance levels Air Leakage - Fixed, Water Leakage B7, Wind Load C5, Condensation Resistance - Frame I-50, Glass I-59, complete with a B7 sill manufactured by Old Castle Building Envelope ***or*** Alumicor Model 230.

All **awning style vented operable sash** in aluminum framed windows tagged as W/# to be:

Model 2000-AR Series Arctic Open-Out Awning window with thermal break to CAN/CSA-A440, performance levels Air leakage A3, Water Leakage B7, Wind Load C5, Condensation Resistance - Frame I-52, Glass I-61, manufactured by Old Castle Building Envelope ***or*** Alumicor 1350 series.

.4 **Insect Screens:**

Insect screens at operable sash components shall meet CGSB 79-GP-1M and CAN#-A440-M90 rating heavy duty, accommodated in extruded aluminum frame having a wall thickness of 1.9mm, finish as specified. Screen cloth shall be:

18 x 14 fiberglass mesh (black)

Flyscreens shall be located between the interior and exterior sliders and shall be removable.

.5 **Break-Shape Aluminum Sills at Windows:**

Break-shape aluminum sills at base of windows and curtain wall (where required) are to be break shape aluminum in 0.051" thickness (gauge) to match exterior finish of adjacent window and/or curtain wall framing components. Ensure sills have drip return at underside and extend from the underside of the window to just beyond the finished face of material below, all with a positive drainage slope away from the building.

.6 **THERMALLY-BROKEN ALUMINUM STOREFRONT SYSTEMS:**

All aluminum framing around exterior entry doors and related components [associated sidelights, transoms etc.] is to be Old Castle Building Envelope 3000 Series or Alumicor 3400 Series thermally-broken storefront framing system complete with 2" wide x 4 1/2" deep framing components throughout suited to 1" thick hermetic glazing panes.

.7 **EXTERIOR ALUMINUM DOORS:**

Insulated Exterior Aluminum Man Doors to be:

Alumicor Thermaporte 7700 series or OldCastle Building Envelope WS-500-TC thermally enhanced doors (2 ¼" thick) in medium style T-600A (fully glazed with 5 3/4" side stiles, 5 5/8" top rail and 7" bottom rail). Doors sizes and components to be as illustrated on Architectural door schedule.

Operable doors to be equipped with Alumicor-supplied continuous gear hinge #7524101, as well as full weatherstripping.

NOTE the need for one fixed 'door' to serve as a sidelight between two operable doors at Door D4.

.8 **FINISHES at ALL ALUMINUM WINDOWS, DOORS, DOOR FRAMES & GLAZING SCREENS:**

a) Finish at Aluminum Window Frames [Fixed Sash]:

- INTERIOR & EXTERIOR FACES *of* ***fixed framing components*** at aluminum framed windows and storefront door framing systems are to be finished in:
  clear anodized aluminum

b) Finish at Horizontal Operable Sash Components:

- INTERIOR & EXTERIOR FACES of **operable sash components** within aluminum framed curtain wall to be finished in:
  clear anodized aluminum

.9 Isolation coating: alkali resistant bituminous paint in accordance with Section 07900.

.10 Sealants: in accordance with Section 07900 in colour(s) selected by architect.

.11 **ALUMINUM CLAD COLUMN COVERS (ACC):**

ACC @ Exterior of Building:
Aluminum clad column covers [noted as ACC on exterior elevations] to be finished at exterior of building in break shape aluminum in 0.051" thickness (gauge), pre-finished in colour:
clear anodized aluminum

ACC @ Interior of Building:
Aluminum clad column covers [noted as ACC on exterior elevations] to be finished at interior of building in break shape aluminum in 0.051" thickness (gauge), pre-finished in colour:
clear anodized aluminum

All ACC items to be in longest practical lengths throughout with seams only where necessary. Fabricate all items to minimize the appearance of seams throughout.

.12 **INSULATED METAL PANELS (MP):**
Insulated Metal spandrel panels [in locations indicated by MP on Architectural drawings] fitted into thermally-enhanced aluminum doors are to be 1" thick permanently-bonded panels comprised of:

- Exterior Face Sheet:
  1.0 mm min. thick aluminum sheet finished in clear anodized aluminum
- Centre Core:
  1" thick rigid insulation
- Interior Face Sheet:
  1.0 mm min. thick aluminum sheet finished in clear anodized aluminum

All aluminum facing panels are to be single sheets free of seams and irregularities.

Ensure that Spandrel panels are fitted into glazing pockets with continuous perimeter seals to suit.

.13 **INSULATED BACK-PANS BEHIND ALL SPANDREL PANELS:**
All interior faces of insulated metal spandrel panels (noted above) and insulated glass spandrel panels (noted in Section 08000) are to be fitted with insulated back-pans, finished flush to the finished interior face of the curtain wall framing system.

Provide a 1" gap between backpan box and interior face of insulated spandrel panel. [Total depth of back pan box to be 1" less than depth of curtain wall back-sections throughout.]

Insulated backpans to be pre-manufactured aluminum or galvanized metal boxes, filled with rigid insulation inside backpan box. Acceptable backpan products include:

'Arctic Pan' by ACM Panelworx
or approved alternate

Maximize the depth of the backpan box (and related insulation thickness therein) relative to the available depth in the curtain wall. All backpan sizes and dimensions are to suit available openings, ensuring tightly fitted gaps throughout. All backpans are to be secured into place and caulked at full perimeter.

NOTE that interior face of backpans (visible to the building interior) are to be fitted with 1.0 mm thick ***clear anodized aluminum facing panel*** painted/finished to match interior window framing (specified elsewhere herein). Interior Aluminum facing panels are to be supplied in a single sheet per opening, laminated to backpan box, and finished tight, neat and flush with surrounding curtain wall framing. Caulk full juncture of aluminum liner sheet with curtain wall framing in a colour-match caulking to suit.

2.2 Window Performance Requirements (Air Infiltration)

.1 Air Leakage; Operable Windows:
Maximum 0-55 M/3/H metre of sash crack length when tested to ASTM E283-73. Rating A-3, CAN/CSA-A440.

Fixed Windows:
Maximum 0-25 M/3 /H/ M/2 when tested to ASTM E283-73. Rating Fixed, CAN/CSA-A440.

.2 Water Resistance:
No evidence of water on interior face of frame when tested to ASTM E547 and CAN/CSA-A440 to level B5 at test pressure 500 Pa.

.3 Wind Load Resistance:
To CAN/CSA-A440, when tested to ASTM E330. Rating - C5 - at test pressure 5000 Pa.

.4 Condensation Resistance:
Window shall be tested to CAN#-A440-M90 for condensation resistance to determine "I" Value to meet winter design temperature and selected relative humidity.

Horizontal Window - Glass - I-61, Frame - I-55
Fixed Window - Glass - I-59, Frame - I-63

2.3 Fabrication

.1 Construct frames to profiles and face sizes shown on drawings.

.2 Design frames in exterior walls to accommodate expansion and contraction within service temperature range of -34 degrees C to 75 degrees C. Make allowances for defection of structure, ensure that structural loads are not transmitted to aluminum work.

.3 General - Fabricate windows using two separate frames joined by means of a thermal break as follows:

Cope and butt join all joints in main frame and sash neatly in weather tight manner and secure by means of screws anchored into integral screw ports. Secure sash corners with thread cutting type screw to ensure tight corners when re-assembling after glass repairs have been made. Internally seal all sash corners. De-burr and make smooth all sharp milled edges and corners of sash and screen frames. Provide outside main frame sill with device extending beyond plane of operating tracks which will prevent the removal or accidental loss of exterior sash or screens to exterior. Provide sill members with minimum 5 degrees slope. Provide sill weep system which will facilitate drainage of water accumulating in sill area, while preventing passage of air, dirt and insects to interior. Fabricate and anchor both inner and outer frames using specified screw fasteners without violating the thermo-barrier. Exposed fasteners or the use of pop rivets not acceptable.

.4 Fabricate entire window in a manner that will allow easy replacement of any defective, damaged or worn components, hardware or weather stripping.

.5 Fixed Windows:
The fixed unit shall consist of two separate frames, joined by means of a thermal break. All joints of the frame shall be butt-type, joined neatly in a weather tight manner. The units shall be designed for field glazing, using a combination semi-solid/wet seal at the exterior weathering joint and a concealed screw applied stop with a resilient gasket at the interior. The stop shall be extruded aluminum.

.6 Aluminum Horizontal Sliding Window Operation:
Exterior sash: left operates, right fixed
Interior sash: left operates, right operates

Completely separate all operating sash surfaces from metal to metal contact. Provide sash members with continuous, integral-type pull handles. Provide quiet, smooth sash operation using nylon glides concealed in sash bottom rails or stainless steel roller wheels. Provide dual weather stripping in sash bottom rails, below nylon glides, which will clean the sill rib as the sash is operated. Provide all interior and exterior operating vents with spring loaded metal locking device to provide automatic locking in closed position at jambs. All operating sash shall be easily removed from the interior for cleaning.

.7 Thermo Barrier:
Provide complete metal-to-metal separation between the two main frame members. Do not use connecting screws, clips or other devices which would tend to bridge the two frame members or restrict in any manner the expansion and contraction of the individual separate frame members. Factory seal between Thermo-Barrier and frame around the entire perimeter to ensure weather tight assembly.

.8 Glazing:
Provide sash frames which will permit glass replacement without the use of special tools.

.9 Weather stripping:
Double weather strip window units at all sash perimeters. Conceal weather stripping to prevent accumulation of foreign matter due to cleaning, operation or handling which would reduce effectiveness or life of seal.

.10 Install all weather stripping in specially extruded ports and secure to prevent shrinkage, movement or loss when removing sash for cleaning or glass replacement.

.11 Exterior Panning Trim:
Provide one piece sections designed to lock into window frame. Join planting sections at corners, utilizing integral screw ports and screws and back seal. Sheet metal formed shapes not acceptable.

.12 Screens:
Factory install in tubular extruded aluminum frames and secure in place using vinyl spline. Screen is to be located between the interior and exterior sash. Screen guide channels or fins which facilitate the operation of the screen shall be an integral part of the window frame or thermal barrier. Channels or fins which are surface applied to the window frame or thermal barrier by means of screws or rivets are not acceptable. Screens must meet CAN3-A440-M90 screen rating - heavy duty.

.13 Apply isolation coating to aluminum to be in contact with dissimilar metals or cementitious materials.

.14 Manufacturer's nameplates on frames and screens are not permitted.

PART 3 - EXECUTION

3.1 INSTALLERS

.1 Use only curtain wall manufacturer’s authorized installers meeting work experience requirements outlined earlier in this Section.

3.2 EXAMINATION

.1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for curtain wall installation in accordance with manufacturer’s written instructions.

a) Visually inspect substrate in presence of Consultant.

b) Inform Consultant of unacceptable conditions immediately upon discovery.

c) Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.3 INSTALLATION

.1 Install curtain wall in accordance with manufacturer’s written instructions.

.2 Do aluminum welding to CAN/CSA W59.2.

.3 Attach curtain wall assemblies to structure plumb and level, free from warp, and allow for sufficient adjustment to accommodate construction tolerances and other irregularities.

a) Maintain dimensional tolerances and align with adjacent work.

b) Use alignment attachments and shims to permanently fasten elements to building structure.

c) Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.

.4 Install thermal isolation where components penetrate or disrupt building insulation.

.5 Install sill flashings (where applicable).

.6 Co-ordinate installation of fire stop insulation, in accordance with Section [07840 - Firestopping], at each floor slab edge [and intersection with vertical construction where indicated].

.7 Install smoke sealing in accordance with Section [07800 – Fire and Smoke Protection] where indicated.

.8 Co-ordinate attachment and seal of perimeter air barrier in accordance with Section [07270 – Air Barriers].

.9 Co-ordinate attachment and seal of perimeter vapour retarder in accordance with Section [07260 – Vapour Retarders].

.10 Install [fibrous insulation] [liquid foam insulation] in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.11 Install insulating glass units and infill panels in accordance with Section [08800- Glazing] and to manufacturer's written instructions.

.12 Install perimeter sealant [to method required to achieve performance criteria, backing materials, and installation criteria in accordance with Section [07920 - Joint Sealing].

3.04 FIELD QUALITY CONTROL

.1 Field Inspection: Coordinate field inspection in accordance with Section [01 45 00 - Quality Control].

.2 Site Installation Tolerances:

a) Variation from plumb: [12 mm per 30 m (0.5 inches per 100 feet)] maximum.

b) Misalignment of two adjacent panels or members: [0.8 mm (0.03 inches)] maximum.

c) Sealant space between curtain wall and adjacent construction: [13 mm (0.5 inches)] maximum.

.3 Manufacturer's Services:

a) Coordinate manufacturer's services with Section [01 45 00 - Quality Control].

b) Submit to Consultant a written agreement from the manufacturer to perform the manufacturer's services.

c) Schedule manufacturer's review of work (including site inspections and written reports) at the following stages:
- 1 review at commencement of work
- 1 review at 50% completion of work
- 1 review at full completion of work

.4 Submit manufacturer's Written Reports to Consultant describing:

a) The scope of inspection/reporting services provided.

b) Date, time and location of site review.

c) Observed installation procedures performed by Sub-Trade noting extent of work complete and conformance to manufacturer's recommendations.

d) Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions relative to the intended application.

.5 Limitations or disclaimers regarding the procedures performed.

.6 Obtain reports within seven days of review and submit immediately to Consultant.

3.05 CLEANING

.1 Progress Cleaning: Perform cleanup as work progresses [in accordance with Sections addressing Cleaning and Waste Management]. Leave work area clean end of each day.

.2 Final leaning: Perform final cleaning of new curtain wall systems and glazing components (vision pane and spandrel panels, caps, aluminum composite panels etc.) to remove all signs of construction and related debris. Panels to be left cleaned and clear of blemishes, spots, smears etc.

.3 Waste Management:

a) Co-ordinate recycling of waste materials with Sections elsewhere addressing Construction Waste Management and Disposal.

b) Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.

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

3.06 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by glazed aluminum curtain wall installation.

PART 4 - ON-SITE TESTING

4.1 On-Site Testing

.1 The Owner reserves the right to appoint an independent testing agency to test installed windows at random for compliance with all requirements contained in the specification. Failure to meet these requirements shall make the contractor liable for full replacement and/or rectification costs for items of concern (cited in Testing Report) as well as cost of further (third party) tests to verify compliance of system including rectification items.

END OF SECTION 08150

PART 1 - GENERAL

1.1 Description of Work

.1 All Finish Hardware [related to man doors throughout] is to include [without strict limitation to] the following:

a) Hardware for all hinged man doors (butt hinges, adjustable piano hinges, closers, locks and latches, bolts, panic bars, kick plates, pulls etc.)
b) Mortised hardware (where specified)
c) Door stops in floor or wall types as required.
d) Metal thresholds, sweeps, weather-stripping.

1.2 Preparation

.1 Supply of Finish Hardware is to be as per accompanying Appendix containing "Finish Hardware Schedule".

.2 Installation of the above noted Finish Hardware to be done by a certified hardware installer. Installation by General Contractor will not be permitted.

1.3 Related Work

.1 Finish Carpentry: Section 06200
.2 Steel Doors and Frames: Section 08100
.3 Architectural Woodwork: Section 06400

1.4 Requirements of Regulatory Agencies

.1 All Hardware on fire rated doors and frames to conform to requirements of NFPA-80 and to bear ULC label.

1.5 Qualification

.1 Personnel who will be responsible for scheduling detailing, ordering, and coordination hardware for this project, shall be experienced hardware consultants. Regular membership in the American Society of Architectural Hardware Consultants is acceptable evidence of such experience.

1.6 Coordination

.1 The finish hardware contract shall be the responsibility of hardware supplier to request shop drawings from related trades for coordinating.

.2 Before supplying materials, ensure by check of drawings, shop drawings and details prepared for the Project, that listed hardware is suitable by dimension and function for intended purposes.

.3 Work of this Section shall include assistance and supervision of installation when requested, and as otherwise provided by the supplier, to ensure correct installation. After installation of all hardware and before building is accepted, the Contractor shall request the hardware supplier to inspect the installations and certify that the hardware is properly installed in accordance with

the manufacturer's recommendations. The guarantee, as published by each manufacturer, will begin when the Owner accepts the building.

1.7 Submittals

.1 Hardware Supplier to prepare required submittals of product noted in Appendix “A” with cut-sheets of all items as per Section 01340.

1.8 Delivery and Storage

.1 Receive and check all hardware from supplier. Protect from pilferage at all times.

.2 Store finishing hardware in locked, clean and dry area.

.3 Package each item of hardware, including fastenings, separately or in like groups of hardware. Label each package as to item, definition and location.

PART 2 - PRODUCTS

2.1 Material

.1 Products shall be as noted in accompanying ‘Hardware Schedule’.

.2 Supply with specified hardware screws, bolts, expansion shields, inserts, and other items and parts required for complete installation and function.

2.2 Manufacturers

.1 Refer to accompanying “Hardware Schedule”.

2.3 Keying

.1 Refer to accompanying “Hardware Schedule”.

PART 3 – EXECUTION

- All items to be installed in full accordance with manufacturers’ recommendations for the intended application relative to the door types noted on the Architectural drawings.

END OF SECTION 08710

FINISHING HARDWARE SPECIFICATION

FOR

LAKE AVE ELEMENTARY SCHOOL

157 LAKE AVENUE N.

HAMILTON, ON

ARCHITECT: WHITELINE ARCHITECTS INC.
146 JAMES STREET
ST. CATHARINES, ON
L2R 6T7

CONTRACTOR:

SUPPLIER:

GROUP 87
ARCHITECTURAL HARDWARE INC.
UNIT #1 – 3245 HARVESTER RD,
BURLINGTON, ONT. L7N-3T7
PH# 905-639-4676
FAX# 905-639-7561
E-MAIL: glen@group87.ca
WEB: www.group87.ca

CONSULTANT: **GLEN C. WIKKERINK**

DATE: January 21, 2021
REVISION: January 25, 2021

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes:

1. Supply of finishing hardware as listed in the hardware schedule, 3.06
2. Supply of bolts, screws, expansion shields and special fastening devices required to properly install finishing hardware.
3. Supply of cylinders only for aluminum doors.

B. Related Sections:

1. Installation of finishing hardware.
2. Metal doors and frames.
3. Wood doors.
4. Roll-up doors and fire shutters.
5. Aluminum door hardware.
6. Toilet partition hardware.
7. Miscellaneous specialties.
8. Power connection to automatic door operators. Provision of conduit between operators and activators, power connection to electric hold open devices, section 16000.

1.02 REFERENCES

1. Hardware for Labeled Fire Doors.
2. N.F.P.A. 80. Fire Doors and Windows.
3. N.F.P.A. 101. Life Safety Code.
4. N.F.P.A. 105. Installation of Smoke Control Door Assemblies.
5. Ontario Building Code.

1.03 SUBMITTAL

1. Make submittal in accordance with section 01340.
2. Prepare a detailed finishing hardware schedule itemizing each opening.
   List all doors by number including size, hand, swing and any and all relevant details effecting the application of finishing hardware.
3. Submit catalogue cuts of all proposed hardware.
4. Submit samples for approval as required.
5. Submit template information to the General Contractor for preparation of product in related sections' and installation of finishing hardware.
6. Prepare for review a detailed key schedule.
7. Submit wiring diagrams and a description of operation for electrified hardware systems specified.
8. Upon job completion, submit to the owners two 'Owners Operation and Maintenance Manuals' containing the following information:
    1. Maintenance instructions for each item of hardware.
    2. Final Hardware Schedule.
    3. Final Keying Schedule.

1.04 QUALITY ASSURANCE

1. Proposed substitutions must be approved by the Architect prior to submission of tender.
2. The hardware supplier must be regularly involved in supplying and expediting contract hardware for projects of this nature. The supplier must employ a certified "**Architectural Hardware Consultant**" to co-ordinate and oversee scheduling, ordering and the supplying of finishing hardware.

1.05 DELIVERY, STORAGE AND HANDLING

1. Hardware is to be delivered to the site in the Manufacturers original packaging. Each item of hardware to be clearly marked with the door number and item number corresponding to the approved hardware schedule. The General Contractor shall receive, check and be responsible for all items of hardware delivered to the jobsite.
2. Hardware supplier to co-ordinate delivery of hardware to the site or to the appropriate parties as noted in section 1.01.B "Related Sections" for installation.
3. Prior to delivery to the jobsite, a dry, secure room is to be provided for storage of the finishing hardware.

1.06 WARRANTY

1. Provide a minimum one year warranty for finishing hardware.
2. Provide a minimum ten year warranty for door closers.
3. Warranty to commence from date of Substantial Completion.

1.07 MAINTENANCE

1. Provide three wrenches for door closer adjustment.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

1.	Hinges	Ives
2.	Exit Devices	Von Duprin
3.	Locksets	Schlage Lock Co.
4.	Cylinders	Schlage Lock Co.
5.	Door Pulls	Standard Metal
6.	Door Closers	LCN Closers
7.	Overhead Stops	Glynn-Johnson
8.	Push, Kick, Armor Plates	Standard Metal
9.	Floor, Wall Stops	Standard Metal
10.	Thresholds, Weatherstrip	KN Crowder
11.	Auto Door Operators	Horton

2.02 MATERIALS

1. All hardware shall be supplied complete with the necessary screw, bolts and other fasteners so as to anchor in position all finishing hardware to the Consultants approval. Exposed fasteners to be finished to match hardware. When a door pull is utilized on one side of the door and a push plate on the other, the plate is to be applied so as to conceal the door pull fasteners.

2. Hinges:

Specified:	Five knuckle 5BB1 series by	Ives
Acceptable Substitute:	Five knuckle BB179 series by	Hager

3. Continuous Hinges

Specified:	027XY	Ives
Acceptable Substitute:	**None**	

3. Locksets:

Specified:	Grade one lever, ND series	Schlage
Acceptable Substitute:	**None**	

4. Exit Devices:

Specified:	98 series by	Von Duprin
Acceptable Substitute:	8800 series by	Sargent

5. Door Closers:

Specified:	4020	LCN
Acceptable Substitute:		
Specified:	4040XP	LCN
Acceptable Substitute:		

6. Overhead Stops:

Specified:	GJ90 series by	Glynn Johnson
Acceptable Substitute:		

2.03 FINISHES

1.	15/652	SATIN NICKEL
	28	ANODIZED ALUMINUM
	26D/ 626	SATIN CHROME
	32D/630	SATIN STAINLESS STEEL
	689	ALUMINUM PAINTED
	AL	ALUMINUM
	PT	PRIMED FOR PAINT

2.04 KEYING

1. All locks to be keyed to EXISTING Schlage factory system, c/w construction i.c. cores.

2. Hardware supplier upon completion of project shall remove the construction cores and install permanent cores

3. Supply: 10 Master Keys
   2 Change Keys per Lock/Cylinder.

PART 3 - EXECUTION

3.01 EXAMINATION

1. Size and condition of opening shall be verified as to door frames being plumb and of correct tolerance to receive doors and hardware. [General Contractor]

3.02 INSTALLATION

1. Review proper mounting heights with the Architect and/or Owner.
2. Standard mounting heights [unless otherwise noted]

A.	Locks/Latches	40-5/16" to centre line of strike from finished floor.
B.	Deadlocks	48" to centre line of strike from finished floor.
C.	Exit Devices	40-5/16" to centre line of strike from finished floor.
D.	Door Pulls	42" to centre line of pull from finished floor.
E.	Push Plate	45" to centre line of Push Plate from finished floor.

The above noted mounting heights are a recommended standard and may vary under special applications and conditions.

3.03 FIELD QUALITY CONTROL

1. After installation of hardware, inspect the installation and certify that the hardware is correctly installed and in accordance with the Manufacturers recommendations.

3.04 ADJUSTING AND CLEANING

1. Upon final completion the hardware is to be left clean and free from defect. Hardware found defective is to be repaired or replaced.
2. All door closers are to be inspected for proper installation and adjustment. Proved a written report from the Manufacturers Representative confirming proper door closer installation and submit the report to the Architect.

3.05 PROTECTION

1. Contractor shall provide proper protection of hardware until turned over to the Owner.

3.06 HARDWARE SCHEDULE

1. Provide hardware in accordance with the schedule as follows:

LEGEND

AL	ALUMINUM
CLSR	CLOSER
DR	DOOR
DS	DEAD STOP
HLDR	HOLDER
HM	HOLLOW METAL
HW	HEAVY WEIGHT
LBR	LESS BOTTOM ROD
MNT	MOUNT
MTG	MOUNTING
NRP	NON REMOVABLE PIN
P.A.	PARALLEL ARM
WD	WOOD

FINISHES

15/652	SATIN NICKEL
28	ANODIZED ALUMINUM
26D/ 626	SATIN CHROME
32D/630	SATIN STAINLESS STEEL
689	ALUMINUM PAINTED
AL	ALUMINUM
PT	PRIMED FOR PAINT

MANUFACTURERS

HINGES	IVES
CONTINUOUS HINGES	SELECT
LOCKSETS	SCHLAGE
EXIT DEVICES	VON DUPRIN
DOOR CLOSERS	LCN
OVERHEAD STOPS	GLYNN-JOHNSON
FLATWARE	STANDARD METAL
DOOR PULLS	STANDARD METAL
FLOOR/ WALL STOPS	STANDARD METAL
THRESHOLDS	K.N. CROWDER
WEATHERSTRIP	K.N. CROWDER
OPERATORS	HORTON

Door Index

Door No	Hdg	Door No	Hdg	Door No	Hdg
D01	01				
D02	19				
D03	03				
D04	04				
D05	03				
D06	05				
D07	06				
D08	06				
D09	06				
D10	07				
D11	07				
D12	05				
D13	08				
D14	06				
D15	06				
D16	09				
D17	05				
D18	20				
D19	20				
D20	20				
D21	20				
D22	10				

Heading 01 (HwSet)

		Hand	Degree Act	Degree InAct
1 SGL	DOOR(S) D01 EXTERIOR FROM HYDRO 103 3'0" x 7'2" x 1-3/4" x HMD x HMF x NON-RTD	LHR	90	

Totals Each Assembly to have:

(1)	1	EA	SECURITY LOUVRE	PLSL 24" X 48" C/W GALV BUG SCREEN	P	ANE
(3)	3	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
(1)	1	EA	STOREROOM LOCK	ND96JD RHO VANDLGARD	626	SCH
(1)	1	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH
(1)	1	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH
(1)	1	EA	CLSR-HLDR-STOP	4040XP S-HCUSH	689	LCN
(1)	1	EA	KICKPLATE	K10A 8" X 34" TAPE MTD.	32D	SMH
(1)	1	SET	WEATHERSTRIP	W-17N 1/36" 2/86"	628	KNC
(1)	1	EA	THRESHOLD	CT-10 36"	627	KNC

Heading 03 (HwSet)

		Hand	Degree Act	Degree InAct
1 PR	DOOR(S) D03 EXTERIOR FROM VESTIBULE 172	LHR	90	90
1 PR	DOOR(S) D05 EXTERIOR FROM VESTIBULE 155	LHR	90	90

2/3'0" x 7'6" x 2-1/4" x ALD x ALF x NON-RTD
Opening Remark: PAIR OF DOORS

Totals Each Assembly to have:

(4)	2	EA	CONTINUOUS HINGE	027XY 89"	628	IVE
(2)	1	EA	FIXED MULLION	BY FRAME SUPPLIER		
(4)	2	EA	PANIC HARDWARE	CD35A-EO 3'	626	VON
(4)	2	EA	MORT. CYL. HOUSING	26-094 X XQ11-948	626	SCH
(4)	2	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH
(4)	2	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH
(4)	2	EA	DOOR PULL	3015-2 #2 MTG 2-1/4" THICK DOOR	630	SMH
(2)	1	EA	SURFACE CLOSER	4021 LH	689	LCN
(2)	1	EA	SURFACE CLOSER	4021 RH	689	LCN
(4)	2	EA	DROP PLATE	4040-18G	689	LCN
(4)	2	EA	OVERHEAD STOP	104S	630	GLY
(4)	2	EA	DOOR SWEEP	W-24S 36"	628	KNC
(4)	2	EA	THRESHOLD	CT-10 36"	627	KNC
(2)	1	EA	WEATHERSTRIPPING	BY DOOR SUPPLIER		

CONTINUOUS HINGE TO BE CUT TO SIZE BY INSTALLER

Heading 04 (HwSet)

		Hand	Degree Act	Degree InAct
1 PR	DOOR(S) D04 EXTERIOR FROM VESTIBULE 159	LHR	90	90

Heading 04 (HwSet) Continued.....

					Hand	Degree Act	Degree InAct
				2/3'0" x 7'6" x 2-1/4" x ALD x ALF x NON-RTD Opening Remark: PAIR OF DOORS			
Totals	Each Assembly to have:						
(2)	2	EA	CONTINUOUS HINGE	027XY 89"	628	IVE	
(1)	1	EA	FIXED MULLION	BY FRAME SUPPLIER			
(2)	2	EA	PANIC HARDWARE	CD35A-EO 3'	626	VON	
(2)	2	EA	MORT. CYL. HOUSING	26-094 X XQ11-948	626	SCH	
(2)	2	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH	
(2)	2	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH	
(2)	2	EA	DOOR PULL	3015-2 #2 MTG 2-1/4" THICK DOOR	630	SMH	
(1)	1	EA	SURFACE CLOSER	4021 LH	689	LCN	
(1)	1	EA	SURFACE CLOSER	4021 RH	689	LCN	
(2)	2	EA	DROP PLATE	4040-18G	689	LCN	
(2)	2	EA	OVERHEAD STOP	104S	630	GLY	
(2)	2	EA	DOOR SWEEP	W-24S 36"	628	KNC	
(2)	2	EA	THRESHOLD	CT-10 36"	627	KNC	
(1)	1	EA	WEATHERSTRIPPING	BY DOOR SUPPLIER			

CONTINUOUS HINGE TO BE CUT TO SIZE BY INSTALLER
MIDDLE LEAF ON ELEVATION TO BE A FIXED PANEL

Heading 05 (HwSet)

			Hand	Degree Act	Degree InAct
1 PR	DOOR(S) D06 EXTERIOR FROM VESTIBULE 149		RHR	90	90
1 PR	DOOR(S) D12 EXTERIOR FROM VESTIBULE 127		LHR	90	90
1 PR	DOOR(S) D17 EXTERIOR FROM VESTIBULE 135		LHR	90	90
	2/3'0" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD Opening Remark: PAIR OF DOORS				

Totals	Each Assembly to have:						
(18)	6	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE	
(3)	1	EA	FIXED MULLION	BY FRAME SUPPLIER			
(6)	2	EA	EXIT DEVICE	CD98EO X 3'	626	VON	
(6)	2	EA	MORT. CYL. HOUSING	26-094 X XQ11-948	626	SCH	
(6)	2	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH	
(6)	2	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH	
(6)	2	EA	DOOR PULL	2309	32D	SMH	
(6)	2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN	
(6)	2	EA	KICKPLATE	K10A 8" X 34" TAPE MTD.	32D	SMH	
(6)	2	SET	WEATHERSTRIP	W-17N 1/36" 2/84"	628	KNC	
(6)	2	EA	DOOR SWEEP	W-24S 36"	628	KNC	
(6)	2	EA	THRESHOLD	CT-10 36"	627	KNC	

Heading 05 (HwSet) Continued.....

		Hand	Degree Act	Degree InAct

Heading 06 (HwSet)

		Hand	Degree Act	Degree InAct
1 SGL	DOOR(S) D07 EXTERIOR FROM CLASSROOM 148	RHR	90	
1 SGL	DOOR(S) D08 EXTERIOR FROM CLASSROOM 139	LHR	90	
1 SGL	DOOR(S) D09 EXTERIOR FROM GYMNASIUM 137	LHR	90	
1 SGL	DOOR(S) D14 EXTERIOR FROM SCIENCE ROOM 130	LHR	90	
1 SGL	DOOR(S) D15 EXTERIOR FROM ART ROOM	RHR	90	

3'0" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD

Totals	Each Assembly to have:					
(15)	3	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
(5)	1	EA	EXIT DEVICE	CD98EO X 3'	626	VON
(5)	1	EA	MORT. CYL. HOUSING	26-094 X XQ11-948	626	SCH
(5)	1	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH
(5)	1	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH
(5)	1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
(5)	1	EA	KICKPLATE	K10A 8" X 34" TAPE MTD.	32D	SMH
(5)	1	SET	WEATHERSTRIP	W-17N 1/36" 2/84"	628	KNC
(5)	1	EA	DOOR SWEEP	W-24S 36"	628	KNC
(5)	1	EA	THRESHOLD	CT-10 36"	627	KNC

Heading 07 (HwSet)

		Hand	Degree Act	Degree InAct
1 PR	DOOR(S) D10 EXTERIOR FROM LEARNING COMMONS 113	LHR	90	90
1 PR	DOOR(S) D11 EXTERIOR FROM RESOURCE ROOM 114	LHR	90	90

2/3'0" x 7'2" x 1-3/4" x HMD x HMF x NON-RTD
Opening Remark: PAIR OF DOORS

Totals	Each Assembly to have:					
(12)	6	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
(2)	1	EA	FIXED MULLION	BY FRAME SUPPLIER		
(4)	2	EA	EXIT DEVICE	CD98EO X 3'	626	VON
(4)	2	EA	MORT. CYL. HOUSING	26-094 X XQ11-948	626	SCH
(4)	2	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH
(4)	2	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH
(4)	2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
(4)	2	EA	KICKPLATE	K10A 8" X 34.5" TAPE MTD.	32D	SMH
(4)	2	SET	WEATHERSTRIP	W-17N 1/36" 2/86"	628	KNC
(4)	2	EA	DOOR SWEEP	W-24S 36"	628	KNC
(4)	2	EA	THRESHOLD	CT-10 36"	627	KNC

Heading 07 (HwSet) Continued.....

					Hand	Degree Act	Degree InAct

Heading 08 (HwSet)

					Hand	Degree Act	Degree InAct
1 SGL	DOOR(S) D13 EXTERIOR FROM MECHANICAL ROOM 128 3'0" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD				RHR	90	

Totals	Each Assembly to have:					
(3)	3	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
(1)	1	EA	STOREROOM LOCK	ND96JD RHO VANDLGARD	626	SCH
(1)	1	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH
(1)	1	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH
(1)	1	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
(1)	1	EA	KICKPLATE	K10A 8" X 34.5" TAPE MTD.	32D	SMH
(1)	1	SET	WEATHERSTRIP	W-17N 1/36" 2/84"	628	KNC
(1)	1	EA	DOOR SWEEP	W-24S 36"	628	KNC
(1)	1	EA	THRESHOLD	CT-10 36"	627	KNC

Heading 09 (HwSet)

					Hand	Degree Act	Degree InAct
1 PR	DOOR(S) D16 EXTERIOR FROM MUSIC ROOM 132 2/3'0" x 7'0" x 1-3/4" x HMD x HMF x NON-RTD Opening Remark: PAIR OF DOORS				LHR	90	90

Totals	Each Assembly to have:					
(6)	6	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE
(1)	1	EA	FIXED MULLION	BY FRAME SUPPLIER		
(2)	2	EA	EXIT DEVICE	CD98EO X 3'	626	VON
(2)	2	EA	MORT. CYL. HOUSING	26-094 X XQ11-948	626	SCH
(2)	2	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH
(2)	2	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH
(2)	2	EA	SURFACE CLOSER	4040XP SCUSH	689	LCN
(2)	2	EA	KICKPLATE	K10A 8" X 34.5" TAPE MTD.	32D	SMH
(2)	2	SET	WEATHERSTRIP	W-17N 1/36" 2/84"	628	KNC
(2)	2	EA	DOOR SWEEP	W-24S 36"	628	KNC
(2)	2	EA	THRESHOLD	CT-10 36"	627	KNC

Heading 10 (HwSet)

					Hand	Degree Act	Degree InAct
1 SGL	DOOR(S) D22 COURTYARD FROM CORRIDOR 150 3'0" x 7'2" x 1-3/4" x HMD x HMF x NON-RTD				LHR	90	

Totals	Each Assembly to have:					

Heading 10 (HwSet) Continued.....

					Hand	Degree Act	Degree InAct
(3)	3	EA	HINGE	5BB1 4.5 X 4 NRP	630	IVE	
(1)	1	EA	DEADBOLT	B662J	626	SCH	
(2)	2	EA	PERMANENT CORE	23-030 C123 50-210, 50-216	626	SCH	
(2)	2	EA	CONST. CORE	23-030-ICX 'A' 50-231	626	SCH	
(1)	1	EA	DOOR PULL	2009-2 X 2009-2 #5 MTG 1-3/4" THICK DOOR	630	SMH	
(1)	1	EA	CLSR-HLDR-STOP	4040XP S-HCUSH	689	LCN	
(1)	1	EA	KICKPLATE	K10A 8" X 34" TAPE MTD.	32D	SMH	
(1)	1	SET	WEATHERSTRIP	W-17N 1/36" 2/86"	628	KNC	
(1)	1	EA	DOOR SWEEP	W-24S 36"	628	KNC	
(1)	1	EA	THRESHOLD	CT-10 36"	627	KNC	

Heading 19 (HwSet)

		Hand	Degree Act	Degree InAct
1 SGL	DOOR(S) D02 EXTERIOR FROM STORAGE 104 EX x EX x 1-3/4" x XHMD x XHMF x	LHR	90	

Totals Each Assembly to have:

(1)	1	EXISTING DOOR & HARDWARE TO REMAIN.	

Heading 20 (HwSet)

		Hand	Degree Act	Degree InAct
1 PR	DOOR(S) D18 VESTIBULE 172 TO CORRIDOR 154		90	90
1 PR	DOOR(S) D19 VESTIBULE 159 TO CORRIDOR 154		90	90
1 PR	DOOR(S) D20 VESTIBULE 155 TO CORRIDOR 154		90	90
1 PR	DOOR(S) D21 VESTIBULE 149 TO CORRIDOR 120		90	90
	EX x EX x 1-3/4" x XHMD x XHMF x Opening Remark: PAIR OF DOORS			

Totals Each Assembly to have:

(4)	1	EXISTING DOOR & HARDWARE TO REMAIN.	

Miscellaneous

Qty	UM	Description	Catalog Number	Hand	Fin	Mfgr
2	EA	CONST. CONT. KEY	48-056 ICX			SCH

Qty	UM	Description	Catalog Number	Hand	Fin	Mfgr
5	EA	CONST. KEY	48-101 ICX			SCH
10	EA	MASTER KEY	49-268			SCH
2		CONTROL KEY	49-269			SCH
1	EA	KEY CABINET	50-70			CAN
1	EA	KEY TAG	H8040			CAN
1			LABEL KEY TAGS/KEYS BY ARCH. DOOR NUMBER			

End of Schedule

PART 1 - GENERAL

1.1 General

.1 Division One (01000 series specifications) General requirements, is part of this Section and shall apply as if repeated here.

1.2 Description of Work

The work shall consist of the following but not limited to:

.1 Hermetically sealed double pane (insulating) glazing units inlocations shown on the drawings. Hermetically sealed double pane glass units may include vision panes and/or spandrel panes as indicated on the drawings.

.2 Single pane glass (in varying types specified herein) at interior doors, frames, glazing screens etc. (in varying frame types as shown on the drawings). Ensure provision of fire-rated and/or safety glass in areas specified herein, on Architectural drawings and/or on Door, Frame and Glazing Screen Schedules.

1.3 Related Work

.1	Final Cleaning	Section 01710
.2	Demolition	Section 02100
.3	Rough Carpentry	Section 06101
.4	Finished Carpentry	Section 06200
.5	Fire Stopping & Smoke Seals	Section 07270
.6	Sealants	Section 07900
.7	Steel Door Frames & Glazing Screens	Section 08100
.8	Aluminum Windows & Doors	Section 08150

1.4 Dimensions

.1 The Contractor shall carefully check all frames and openings to be glazed in the field to determine all opening sizes; do not cut the glass until dimensions have been site-verified.

1.5 Glass Breakage

.1 The Contractor shall be responsible for all glass broken or unsuitable because of faulty setting or manufacturer's errors or product failure Glass broken by others shall be replaced by the glazing sub-contractor.

1.6 Environmental Conditions

.1 Glaze with compounds, sealants or tapes only when glazing surfaces are at temperatures over 45ºF (7.5°C), and when positive that no moisture is accumulating on them from frost, rain, mist, or condensation.

1.7 Glass Design

.1 This contractor shall be responsible for proper glass thickness, design and type as required by all prevailing Codes and mandated legislations. Report any such discrepancies in glass design, type and thickness immediately to the Architect during tendering.

.2 Glass types, sizes and locations to be as shown on Architectural drawings and all related door, frame, window and glazing Schedules as applicable.

PART 2 - PRODUCTS

2.1 Glass Materials

.1 Polished float glass to CAN2-12.3M and amendments; glazing "A" quality, thickness and tint as indicated. Units to be tempered, laminated where specified or where required by the O.B.C.

.2 Sealant compound: multicomponent, chemical curing to CAN2-19.24 M80 type 2, class A, black colour.

.3 Glazing tape for non-rated applications: pre-formed butyl tape, Tremco 440 black colour, 5mm thick x 10mm wide.

.4 Glazing tape for fire-rated glass: must be PVC, 3mm thick x 12 mm wide

.5 Setting blocks: neoprene, Shore "A" durometer hardness 80, 75mm long x 2.4mm thick x 5mm high.

.6 Spacer shims: neoprene, Shore "A" durometer hardness 70, 75mm long x 2.4mm thick x 5mm high.

.7 Primer-sealers and cleaners: to glass manufacture's standard.

.8 Low-E solar rejection film shall be as specified, applied to surfaces noted.

2.2 Fabrication

.1 **GLASS at INTERIOR DOORS and GLAZING SCREENS:**

Standard Applications:

Single pane glass at interior doors, sidelights and glazing screens (denoted on drawings as ‘gl.’and/or ‘glass’) is to be clear 6mm min. thick glass throughout as noted:

- clear tempered impact-resistant glass in all panes below 7-2” a.f.f
- clear float glass in all panes above 7’-2” a.f.f.

.2 **VISION PANE (VP) INSULATED GLAZING @ EXTERIOR WINDOWS, CURTAIN WALL & DOORS:**

Vision panes of insulating/hermetic glazing is to be used in:
- all fixed sash
- all awning window operable sash
components of exterior windows and/or curtain wall.

Insulated Glazing/Hermetic glass units are to be supplied by Oldcastle Building Envelope, Trulite, Saand or approved alternate.

Insulated Glazing units are to be 25.4 mm thick Double-Glazed Hermetically Sealed Unit consisting of:

- *Exterior Sheet:*
  6 mm Vitro Glass/PPG 'Solargray' tinted glass, with PPG Solarban 60 film on surface 2
  or
  6 mm Guardian 'Gray Float' tinted glass, tempered, with Sunguard 'SN 68' film on surface 2
- *Vacuum Space:*
  1/2" argon-gas space (90% argon, 10% air) with 'Technoform I-Spacer' in colour black
- *Interior Sheet:*
  6 mm clear glass, tempered

.3 SINGLE PANE GLASS SPANDREL PANELS (SP) in WINDOW WALL FRAMING:

Glass spandrel panels in Window Wall [W-#], in locations identified on architectural drawings as denoted by 'SP' are to be as noted below.

Single pane spandrel to be:
6 mm clear glass, heat-treated, with 100% coverage 'Warm Gray' ceramic frit #24-8287 on surface 4
or
6 mm Guardian 'Sunguard Spandrel HT-Warm Gray' [heat-treated glass with full ceramic frit on surface 4]

Note that all single pane spandrel glass is to be secured to window wall framing with surface applied stops from the exterior.

PART 3 - EXECUTION

3.1 Examination

.1 All wood and steel shall be properly primed by others before glazing, and primer must be hard and dry. All openings must be free from moisture, frost, rust, dirt, plaster, cement, oil or grease.

.2 The Glazing sub-contractor shall examine all openings to be glazed and shall report any conditions which may affect the work of this trade before commencing. Commencement of work will be construed as an acceptance of conditions.

3.2 Installation of Interior Glazing

.1 Remove protective coatings and clean contact surfaces with Interior solvent and wipe dry. Apply primer-sealer to contact surfaces.

.2 Glazing compound shall be neatly run in straight line paralleled with glazing rebate. Corners shall be carefully made.

.3 All glass shall be back and face bedded in glazing compound with 3mm (1/8") clearance on all sides. Glass shall be set on setting blocks as required, with equal bearing on the entire width of plane. Convex side of glass shall be on exterior.

.4 Insert spacer shims to centre glass in space. Place shims at 100mm o.c. Keep 6mm below sight line.

.5 Install removable stops, without displacing tape or sealant.

.6 Apply cap bead of sealant, at exterior void, in a uniform and Level line, flush with sight line, tooled or wiped with solvent to smooth appearance.

3.3 Thermal Glazing Installation

.1 Accurately measure glass openings and calculate glass size based on manufacturer's installation tables allowing for proper edge engagement, rabbet width, rabbet depth, tolerances for expansion and contraction etc.

.2 Before glazing, verify openings to see that they are square, plumb, and in true planes. If found otherwise, do not proceed with glazing until proper corrections are made.

.3 Set hermetically sealed insulated glass units on setting blocks placed at ¼ points from each corner of glass.

.4 Dry glaze by means of EPDM gaskets on interior and preformed glazing tape with built-in shim on exterior.

3.4 Cleaning

.1 Immediately remove all excess sealant and compound and droppings from finished surfaces.

.2 Clean all glass prior to handover to Owner, ensuring it is clear of surface soiling and debris of any sort.

END OF SECTION 08800

PART 1 - GENERAL

1.1 General

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

1.2 Description of Work

Provide all labour, materials, and equipment required or called for in this specification, or which is necessary to complete the work without any extra cost. This work *may* require, without strict limitation to the following (at the building interior and/or exterior):

.1 Priming and painting of interior masonry, gypsum board, cement plaster, plaster and other surfaces as indicated on Drawings and Schedules.

.2 Finish priming and painting of steel doors and frames, and other non-prefinished metal components including priming and finish painting of all miscellaneous steel items contained within the Architectural and related Engineering drawings.

.3 Staining and topcoating or other finishing of all wood and wood veneer items (including trimwork, wood perimeter of plastic laminate doors, hardwood veneered cabinetry etc.) as applicable.

.4 Painting and/or priming (as required) of all new non-prefinished miscellaneous metal items (convector cabinets, fire-hose cabinets, access hatches) etc.

.5 Re-painting and/or priming (as required) of existing metal items (convector cabinets, fire-hose cabinets, access hatches) etc. specified for new paint finish.

.6 Painting of exposed metal ducts, grilles, louvers and related equipment as indicated on the drawings and schedules.

.7 Painting of steel structural items throughout.

.8 Painting of miscellaneous non-prefinished steel and metal items (bench supports, countertop supports, lintels etc.)

.9 Complete preparation of existing painted surfaces (specified for re-paint) including all related sanding, scraping, and removal of loose existing paint, testing of existing paint (for determination of compatible paint formulations), and priming of all existing surfaces (following Preparation) prior to re-painting as specified.

.10 Other associated work as indicated on drawings and schedules.

1.3 Related Work by Others

.1	Shop priming structural steel	Section 05120
.2	Shop painting miscellaneous metals	Section 05500
.3	Steel Doors & Frames	Section 08100
.4	Metal Stud and Gypsum Board	Section 09111
.5	Concrete Masonry Units	Section 04220

		.6	Sealants Section 07900
1.4	**Requirements of Regulatory Agencies**	.1	All finishes shall meet the flame spread and smoke development requirements of the Ontario Building Code for the specific location and application for all parts of the Work.
1.5	**Environmental Requirements**	.1	Apply finishing materials only when air and surface temperatures have reached the minimum level recommended by the manufacturer's specification for each product, and have been maintained at this temperature for a minimum of 24 hours.
		.2	Do not apply exterior finish in direct sunlight that raises surface temperatures above that for proper application and drying, nor in rainy, foggy or windy weather.
		.3	Do not apply finishes when relative humidity is over 50%, when condensation has formed or is likely to form, nor immediately following rain, frost or dew.
		.4	Do not apply paint where moisture content, in gypsum board, pipe insulation or wood is above paint manufacturer's recommended maximum allowances. Confirm results of moisture test with Architect before proceeding.
		.5	Do not apply paint finish in areas where dust is being generated.
1.6	**Colours and Samples**	.1	All colours shall be as scheduled by the Architect on the Colour and Finish Schedule or as specified herein.
		.2	Paint samples shall be prepared as directed by the Architect in accordance with Section 01340 and 1.11 of Section 09900. All site work on site must be completed to match approved sample. All product mixing and work on-site must be preceded with Architect's approved samples for paint & stain, lacquer and varnish, etc. Acceptable paint and stain samples include 8” x 11" (minimum) sample size. Only “draw down” samples of actual paints will be accepted for paint colours. Minimum requirements are 2 draw down samples per paint colour per different paint product and per different paint finish. Stain samples to be applied to wood sample of wood species specified for use in the project.
1.7	**Cooperation with Others**	.1	This contractor shall examine all drawings and specifications of all trades throughout the building for information affecting the work of this trade.
1.8	**Plant and Scaffolding**	.1	The contractor shall provide all plant and scaffolding necessary for proper and efficient performance of the work.
1.9	**Field Quality Control**	.1	Arrange for periodic visits to site by paint manufacturers' representatives while work is in progress. On each visit he shall verify that specified materials and methods are used, and that procedures agreed upon at the initial site meeting are followed.

1.10 Product Delivery, Storage and Handling

.1 Deliver to site each container sealed and labeled with manufacturer's name, catalogue number or brand name, colour, and formulation type, reducing instructions, and reference standard specification number if applicable

.2 Store materials on site, and in an area specifically set aside for purpose, that is locked, ventilated, maintained at a temperature of over 4 degrees C (40 degrees F) and protected from direct rays of sun.

.3 Ensure that health and fire regulations are complied with in storage area. Provide carbon dioxide fire extinguishers of 9 kg (20 lbs.) minimum capacity in each storage area while materials are contained within.

.4 On each container, for materials requiring a fire hazard classification, attach an Underwriter's label verifying that the material is listed under their label service, and giving the hazard classification.

1.11 Protection

.1 Cover or mask surfaces adjacent to those receiving treatment and finishing to protect work of others from damage and soil. Mask instruction and specification plates attached to equipment being painted.

.2 Take particular care in storage and mixing areas that floors are protected by tarpaulins and metal pans.

.3 Place cloths and other disposable finishing materials, that are a fire hazard, in closed metal containers containing water, and remove from building every night.

.4 Coordinate with the appropriate trades for the removal from finished surfaces, storage and reinstallation after finish work is completed of finish hardware, switch and receptacle plates, escutcheons, luminaries frames, and similar items.

.5 Post "No Smoking" signs and ensure that spark-proof electrical equipment is used in areas where flammable painting materials are being applied.

.6 Post "Wet Paint" signs throughout freshly finished areas and remove when finishes are dry.

1.12 Colour and Product Fidelity and Finish

.1 Draw Down samples of each paint colour and paint sheen for each different paint product must be approved by the Architect prior to installation. The Contractor will retain 1 full set of the approved samples on site and is responsible to verify the application of the proper colours and products throughout the project. The Architect reserves the right to enforce full conformance of the finished work to the approved samples and specified products as shown on drawings, Schedules, Addenda’s, and all Contract Documents. Any colours or products which the Architect deems unsuitable due to lack of colour or sheen fidelity, improper application, poor workmanship or any conditions not in strict accordance with the Contract Documents will be rectified by the Painting Contractor to the full satisfaction of the Architect in accordance with the Contract Documents at no cost increase.

PART 2 - PRODUCTS

2.1 Paint Materials

.1 Painting materials such as primers, paints, rust-inhibiting agents, stains, fillers, varnishes, lacquers, etc., to be supplied by Benjamin Moore, Sherwin Williams or ICI/Dulux only. All paint to be highest professional/commercial grade products available from each manufacturer as prescribed in PART 3 below, relative to the intended application. Only OPCA/CPCA/CGSBQ approved equivalents within the noted manufacturers will be accepted.

Painting contractors must inform the Architect in writing which product line he intends to use and is to receive approval prior to mixing. Selection of final product line is completely at the Architect's discretion and the Architect reserves the right to select any of the specified product lines at no cost increase.

.2 All materials to be the highest professional/commercial grade available from the manufacturer for each finish type, to meet or exceed CGSB Specifications, as outlined in PART 3 herein.

.3 Materials for application of each finish type shall be products from a single manufacturer.

.4 Materials such as putty, linseed oil, shellac, turpentine, etc., shall be pure, or of the highest quality produced or recommended by the paint manufacturer, and bear an identifying label on the container.

.5 Gypsum Board patching compound: Resurfo by Reardon or alternate.

PART 3 – EXECUTION & INSTALLATION

3.1 Paint Colours

.1 All paint/pigment colours and locations to be in full and strict accordance with Architect's drawings, Room Finish Schedule and Colour Finish Schedule. Any areas or items requiring paint finishes which appear unclear or which are insufficiently documented, are to be reported to the Architect for direction prior to paint mixing and installation. Any site work relative to such items undertaken by the Contractor or trades without the consultation of the Architect is the sole responsibility of the Contractor and is subject to further rectification of the work for unacceptable materials, colours, or finishes, as per the Architect's direction, at no cost increase.

.2 Except where noted otherwise within the Contract Documents, and excluding those surfaces featuring painted wall graphics, the Architect reserves the right to select any number of paint/pigment colours for each room, up to one individual colour per wall surface/wall plane (or ceiling surface/ceiling plane), at no cost increase. This applies only to wall and ceiling surfaces and excludes trims and other architectural features thereon. For all other architectural items associated with the walls, floors, ceilings, etc. in each room, the Architect reserves the right to select another paint colour differing from that of the adjacent surfaces at no cost increase. All paint colours to be noted on Colour/Finish Schedule (issued post-Tender).

3.2 Examination

.1 Verify that specified environmental conditions are ensured before commencing work.

.2 Ensure that surfaces to receive finishing materials are satisfactory for specified materials and will not adversely affect execution, permanence, or quality of work.

.3 Maintain on site at all times until work is completed a moisture meter, hygrometer and thermometer to verify surface and environmental conditions. Test all surfaces for moisture content with an electronic moisture meter, and concrete, masonry, exterior insulation and finish systems, plus plaster surfaces for acid alkali balance with appropriate equipment and procedures.

3.3 Mixing

.1 Unless specified otherwise paints shall be ready-mixed. All catalyzed products to be mixed on site to as required to provide a uniform and optimal finish quality.

3.4 Workmanship

.1 All work must be executed by skilled, experienced mechanics under the direction of a competent foreman. All paint and enamel shall be evenly spread and no coat shall be applied until the previous coat is perfectly dry.

.2 All products are to be applied in full accordance with the paint manufacturer's recommendations, including surface preparations, recommended application tools, techniques, intermediate drying times, etc. All products are to be applied in full accordance with the manufacturer's maximum recommended dried film thicknesses (dft) throughout.

.3 There shall not be any drips or runs of materials. The woodwork shall be well-rubbed down before the first coat and between all coats. All work shall be to the satisfaction of the Architect.

.4 Brush on all painting materials covered by this division, except where noted in 3.4.8 below. If this contractor wishes to spray certain surfaces, obtain prior approval from the Architect. Apply painting materials evenly and smoothly.

.5 Sand and dust between each coat to remove defects visible from distance up to 1.0m (3' -0").

.6 Finish bottoms, tops, edges and sides of all doors, including returns to cutouts where applicable.

.7 In the opinion of the Architect, the number of coats of paint specified should produce a superior finish. However, if more coats than the number specified are required to meet the approval of the Architect, they shall be supplied and applied at no extra charge. Painting contractor may be required to verify dry film thickness (dft) of any products applied under this Section, at no cost increase.

3.5 Preparation

.1 All surfaces or materials to receive paint finish are to be prepped in full accordance with the finish manufacturer's specifications relative to the material substrate, using the finish manufacturer's recommended products. It will be assumed by the Architect that any improperly adhering paint finishes are the result of inadequate preparation or improper application, and are subject to full rectification at no cost increase.

.2 Touch-up shop painted primer on steel with approved primer. Tint filler to match stains for stained woodwork.

.3 Prepare galvanized steel and zinc coated surfaces with one coat of copper sulfate solution in water (1:16 proportion).

.4 Prepare exposed concrete, plaster and masonry to make free of dust, dirt, grease, loose mortar on face, etc. Apply filler to concrete block of sufficient density to eliminate pinholing.

.5 Interior gypsum board to be prepared by cutting out minor imperfections, such as scratches, cracks, abrasions in surface, and filled with patching compound; sand smooth when dry. Seal before prime coat application.

.6 Prepare wood finishes (designated for stain and/or clear topcoat finish) by applying matching (or stainable) wood filler to suit, at nail holes, gaps, cracks and imperfections, blending filled spots with adjacent surfaces. Sand all filler smooth and flush with adjacent surface, applying in multiple coats as required. Ensure that all wood is adequately sanded and free of contaminants which may adversely affect quality and consistency of subsequent stain and/or topcoat finishes.

.7 PREPARATION of PREVIOUSLY COATED SURFACES:
Painting Contractor to investigate all previously coated surfaces to determine necessary requirements to ensure proper adhesion and formulation compatibility of newly specified paint finishes throughout.

Existing painted surfaces (specified to be re-painted) are to be tested with methyl-hydrate to determine if they are alkyd or water-based materials to determine compatible formulation of new paint materials.

All existing coatings are to be properly cleaned, scraped and prepared for recoat to ensure full and lasting adhesion of new paint finish. Preparation shall include any form of mechanical abrasion required (sanding, scraping, sandblasting, shot-blasting etc.) to remove peeling and/or loose paint finishes to ensure a proper and lasting bond of new paint finish.

Existing clear topcoated surfaces (varnish, polyurethane, oil-based or waterbased clearcoats etc.) are to be properly scraped, sanded and de-glossed as required to remove any topcoats which are not fully adhered to their substrate.

Supply and install new high-adhesion bonding primers, stain-blocking primers and/or sealant primers as required prior to repainting. Bonding primers should be selected to ensure adhesion and perfomance of the final paint finish. Non-waterbased primers are acceptable to ensure adhesion throughout.

3.6 Mechanical and Electrical Equipment

.1 Paint exposed conduits, pipes, hangers and other mechanical and electrical equipment in and adjacent to finsished areas. Colour and sheen to match adjacent surfaces.

.2 Paint both sides and all edges of plywood backboards for electrical equipment before installation. Leave equipment in original finish except for touch-up as required.

3.7 Exterior Coatings

The items noted in this section below are provided for reference as/if required.

.1 Miscellaneous Steel Lintels and Non-prefinished Steel Items:
- 1 coat Sherwin Williams "Kem Bond Hi-Solids" Universal Metal Primer (alkyd); VOC compliant
- 2 coats Sherwin Williams "Industrial Enamel Urethane" topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant [spray applied finish at steel doors]

.2 Miscellaneous Ferrous Metals:
- 1 coat Sherwin Williams "Kem Bond Hi-Solids" Universal Metal Primer (alkyd); VOC compliant
- 2 coats Sherwin Williams "Industrial Enamel Urethane" topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant

.3 Miscellaneous Galvanized Items:
- 1 coat Sherwin Williams "Galvite HS" acrylic primer, B50 WZ30 Series, spray applied
- 2 coats Sherwin Williams "Industrial Enamel Urethane" topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant

3.8 Interior Coatings

It is the intention that various (existing) interior [previoulsy painted] items may be re-painted as part of this scope of work.

Whether or not expressly noted below, it is required that all items to be repainted are to be prepped in accordance with Section 3.5 (Preparation), using additional products (as required) including suitable bonding primers and/or sealing primers (such as Sherwin Williams 'Extreme Bond - Bonding Primer', Sherwin Williams 'PrimeRX Peel Bonding Primer', Zinsser 'Bullseye Shellac Bonding Primer' and/or similar products). Primers to be selected specific to individual application requirements based upon site requirements.

.1 Concrete Block - Paint Finish:
- 1 coat Sherwin Williams "Prep Rite" Blockfiller, B25 Series
- 2 coats Sherwin Williams abrasion resistant "Duration Interior Latex" A98 Series *or* Dulux "Diamond Interior 100% Acrylic", satin finish

.2 Gypsum Wall Board Walls – Paint Finish
- 1 coat Sherwin Williams "Prep Rite 200" Primer, B28W200 Series

- 2 coats Sherwin Williams abrasion resistant “Duration Interior Latex” A98 Series *or* Dulux “Diamond Interior 100% Acrylic”, satin finish

.3 Gypsum Wall Board Ceilings/Bulkheads - Paint Finish:
- 1 coat Sherwin Williams “Prep Rite 200” Primer, B28W200 Series
- 2 coats Sherwin Williams “Promar 200 Zero VOC” Interior Latex” Interior Acrylic, eggshell finish

.4 Steel Door and Frames and All Miscellaneous Non-prefinished Steel Items (u.n.o.) – Paint Finish:
- 1 coat Sherwin Williams “Kem Bond Hi-Solids” Universal Metal Primer (alkyd); VOC compliant
- 2 coats Sherwin Williams “Industrial Enamel Urethane” topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant

.5 Galvanized and Zinc coated Metals – Paint Finish:
- 1 coat Sherwin Williams “Galvite HS” acrylic primer, B50 WZ30 Series, spray applied
- 2 coats Sherwin Williams “Industrial Enamel Urethane” topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant

.6 Exposed Underside of Metal Deck, Open Web Steel Joists, Steel Roof Structutre, Exposed Metal Ducts, Conduit, etc. – Paint Finish:
- 2 coats Sherwin Williams “Waterborne Acrylic Dryfall”, B42 Series, eggshell finish, spray applied

.7 Repainted Hollow Metal Doors, Door Frames and Glazing Screen frames (as applicable):
- 1 coat appropriate bonding primer
- 2 coats Sherwin Williams “Industrial Enamel Urethane” topcoat (alkyd), B54W151 Series, gloss finish; VOC compliant

3.10 Touch-Up & Cleaning

.1 Touch up and finish visible defects in the work. Refinish entire wall, ceiling or finished surface where substrate and/or finish is significantly damaged or not deemed acceptable by the Archtitect.

.2 Remove all overspray paint or similar finish from prefinished or unpainted items throughout. Clean and remove any paint overspray of one colour on a painted surface of dissimilar colour or finish. Repaint and restore finishes as required to blemish-free state.

.3 Leave storage and mixing areas clean and in same condition as adjacent spaces in project.

END OF SECTION 09900

PART 1 - GENERAL

1.1 Description of Work

.1 Removal of all existing blinds by demolition contractor.

.2 Supply and installation of new chain-driven sheer-weave roller blinds and all related mounting and operating hardware in the types and locations noted below. ***Refer to drawings to determine locations of new blinds and existing blinds to be removed and reinstalled***.

MANUAL EXTERIOR WINDOW BLINDS (3% TRANSMISSION):

- Classrooms 151 / 152 / 156 / 157 / 158 / 162
- Learning Commons 113
- Resource Room 114

1.2 Related Work

.1	Painting and Decorating	Section 09900
.2	Aluminum Windows and Doors	Section 08150

1.3 Shop Drawings

.1 Provide shop drawings in accordance with supplementary and/or general conditions. Show dimensional layouts together with fabrication and installation details based on site conditions.

.2 The general contractor, upon request, to forward to this sub-contractor a complete set of architectural drawings, specifications, addenda and colour schedule for use in preparation of shop drawings and execution of installation.

1.4 Samples

.1 Samples to be provided to the architect and/or owner, for his perusal and approval of all materials to be utilized in this installation.

1.5 Warranty/Guarantee

.1 Installation of all materials and products is to be guaranteed for a period of one year from date of Building Occupancy. This warranty covers both labour and material for replacement of defective items and/or components.

PART 2 - PRODUCTS

2.1 Materials/Design

.1 Acceptable products include "Teleshade" smooth chain-operated sprocket roller blinds as manufactured by: Solarfective Products Ltd. or "Deko Light Lift System" as manufactured by Altex Sun Project Inc.

All products to be manually operated complete with all related operating hardware, mounting hardware and screening fabrics providing the transmission percentages specified in Part 1 earlier herein.

All shades specified herein will be provided by one manufacturer who shall take full responsibility for the supply and installation of the product.

All shades shall be mounted as per section details.

All roller blinds are to be **inset-mounted** into framed window openings/recesses throughout, with minimal gapping between shades and adjacent walls. Overlay mounting of blinds (over top of framed window recesses) will not be accepted unless specifically approved.

Rectangular headers/shade tubes/cassettes to be approx. 79mm deep x 96 m high throughout. All window blinds are to be securely anchored into suitable architectural materials in/within wall or ceiling assemblies and are NOT to be mechanically fastened to aluminium or metal curtain wall or window frames throughout.

Installations in continuous/long window runs are to be comprised of multiple blinds neatly and tightly mounted side-by-side. Ensure that joints between adjacent blinds align with vertical window frames throughout. No vertical seams between adjacent blinds falling in the middle of a vision pane will be accepted.

All shades are to be sufficiently long to reach existing sill height in each room. Sill heights to be as shown on the Architectural drawings [Building Elevations] and related window sections provided therein. Site verify actual sill heights to suit, allowing for same herein.

.2 **Operation/Action**

Manual: Easy-Lift (Chain-operated) Action with infinite positioning. Left or right hand operation available to be determined by installer relative to site-conditions and/or as directed by Architect or Owner.

.3 **Product Assembly**

a) Provide fully factory assembled shade unit consisting of 2 end brackets, shade tube, extruded aluminium fascia, hembar and fabric specified. Removal must not require the disassembly of the shade unit.

b) End Bracket: the 77 x 96 mm end bracket shall be a two piece moulded ABS construction with a 64 mm diameter nylon drive sprocket. Brackets colour shall co-ordinate with the fascia colour.

c) Shade Tube: 38 mm extruded aluminium shade tube shall be 1.52 mm thick with three internal continuous fins 4.82 mm high, for strength and drive capabilities when attached to the nylon sprocket. The fins shall be spaced 120 degrees apart.

d) Header/Cassette: the extruded aluminium header/ cassette shall be 1.7 mm thick rectangular profile measuring approx. 77 mm deep x 96 m high. Header to fully conceal internal shade tube/roller. Header finish to be anodized aluminium or paint colour selected by Architect from manufacturer's full colour range.

e) Drive Assembly: Shall be factory set for size and travel of shades. Capable of being field adjusted from the exterior of the shade unit without having to disassemble the hardware. Provided with a built-in shock absorber system to prevent chain breakage, under normal usage conditions.

f) Drive Chain: Shall be No. 10 stainless steel bead chain formed in a continuous loop. The chain shall have a 90# (lb.) test. Supply wall-mount brackets/loops for loose end of chain where directed by the Architect. Ensure that underside of operating chains are mounted at a reasonable height above finished floor level to be readily accessible. No chains to be higher than 4'-6" a.f.f.

g) Bottom-Weighted Hembar: extruded aluminium with plastic end finials. Finish to be clear anodized aluminium throughout.

.4 **Shading Fabric**

All screening fabric transmission requirements respective to locations to be as specified in Part 1 above. Fabrics based upon percentages of light transmission to be:

Dow 'Phifer Shearweave' woven PVC fabric in the openness factor (% of light transmission) specified elsewhere herein.

Transmission shade fabrics shall be woven of .018 opaque, vinyl coated polyester yarn consisting of approximately 79% vinyl and 21% 500 dernier polyester core yarn. The fabric shall be tensioned in the finishing range prior to heat setting to keep the warp ends straight and minimize or eliminate weave distortion to keep the fabric flat. The fabric shall be dimensionally stable.

All fabric colours to be Eco/Granite [grey tone] throughout or as selected by Architect from manufacturer's full colour range.

As a "shade cloth" the fabric shall hang flat, without buckling or distortion. The edge, when trimmed, shall hang straight without ravelling. An unguided roller shade cloth shall roll true and straight, without shifting sideways more than + 1/8" in either direction due to warp distortion or weave design.

Fabric shall be certified by an Independent Laboratory to pass the Small Scale Vertical Burn Requirements test CAN and UCL-S109-M87 and NFPA 701.

PART 3 - EXECUTION

3.1 Examination

.1 Prior to commencement if erection, all surfaces to be checked for irregularities, trueness, rigidity and projections. Defects to be reported immediately to the general contractor for correction.

3.2 Installation

.1 Erection/Installation of product shall be carried out in a to ensure a rigid, straight, square, plumb, and level assembly and operation of shades in accordance with the supplier's installation instructions. Supplier/installer is responsible to provide all related anchors and fasters suited to the applicable substrates throughout.

.2 On completion of the installation, all materials and workmanship are to be inspected for proper operation, rigidity and appearance, and any defective materials are to be replaced with new materials prior to final inspection.

3.3 Special Cleaning

.1 Upon completion of all work clean and remove all dirt from blind components, and leave all elements in an unblemished factory condition at the time of handing over to the Owner.

END OF SECTION 11500