FLOROS CONCEPT
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BID DOCUMENT

AJAX HIGH SCHOOL

105 Bayly Street East, Ajax, ON

SOUTH ELEVATION WINDOW REPLACEMENT

ISSUED FOR TENDER
February 6, 2025

DDSB Tender #: T25-11

24-018

INTRODUCTORY INFORMATION

BIDDING

SPECIFICATIONS

Division 1 – General Requirements

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Reference

DRAWINGS

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 11 13 – Work Covered by Contract Documents

1.1 GENERAL

.1 Bids shall be based on the materials, methods and qualifications as outlined in the bid documents. If the contractor cannot meet the requirements, no bid shall be entered.

.2 Refer to the technical specifications and drawings sections for products, and technical requirements.

.3 All qualifications (years of experience, approved installer/applicator, etc.) noted in the bid documents are required at the time of bidding.

1.2 SCOPE OF WORK

.1 The Work outlined herein is a general description and must be read in conjunction with all bid documents.

1.3 PURPOSE OF WORK

.1 The purpose of this project is to carry out window replacement at the noted school area.

1.4 SCHEDULE

.1 Refer to the DDSB front end documents for the schedule for the project.

1.5 HAZARDOUS MATERIALS

.1 A hazardous material survey has been completed by DDSB and is included for information.

.2 Removal techniques included in the scope of work are to account for the presence of the hazardous material and included in the Contract Value.

1.6 BASE BID

.1 Mobilization

.1 Mobilize on site all plant, tools, equipment and labour required to carry out this Work.

.2 Bonds and Permits

.1 Provide specified bonds to the Owner following the contract award. Work must not commence without the submission of the Performance Bond, and the Material and Labour Bond.

.2 Obtain and pay for all Federal, Provincial and Municipal permits necessary for this work with the exception of the building permit, which, if required, will be obtained by the Owner.

.3 General Requirements

.1 Provide all the necessary labour, plant, equipment, and materials necessary to conform to all requirements as specified in the Contract Documents. This includes, but is not limited to access (interior and exterior as required to facilitate work), shoring, etc.

.2 Install all necessary fencing, hoarding, barriers and signage to protect staff, building elements, vehicular and pedestrian traffic in accordance with the Occupational Health and Safety Act. Include all necessary construction signage and coordination. Signage is to be properly lettered and visible. In addition to preventing injury, all work areas must be protected from damage due to equipment. Height of fencing is to be a minimum of 8 feet.

.3 Provide temporary support to existing structural loads, where required, to ensure the building is maintained in a safe condition and damage is not caused to building elements; this includes bracing of existing walls and shoring of exterior wall and roof elements. Any damage as a result of inadequate shoring or support shall be rectified at no additional cost to the Owner.

.4 Include the manufacture and installation of all necessary material and system site mock-ups that will be required to the satisfaction of the Owner and Consultant. This may include specific supply of materials in advance of material selection to perform said mock-ups. Multiple mock-ups of the same material/system may be required to confirm performance and installation, and material selection.

.5 Maintain all building egress points as fire exits during construction unless otherwise confirmed by a fire safety plan or fire department approval. Post all necessary signage to indicate construction and erect all barricades/hoarding protection necessary to direct pedestrians through the construction area.

.6 If the Contractor deems it necessary to temporarily remove any permanent exterior furnishings such as fencing, benches, bollards, etc. to facilitate access, the cost to remove and reinstate or replace such elements shall be included in the pricing of these general requirements.

.7 Remove and reinstate exterior wall mounted accessories (i.e. light fixtures, conduit, drainage downspouts, security cameras, etc.) as required to complete the work.

.8 Make allowances during construction for down time made necessary for access to and review of the Work by the Consultant.

.9 In addition to preventing injury, all work areas must be protected from damage due to equipment. Install temporary protection (i.e. plywood sheets, rigid insulation, tarps, etc.) to ensure landscaping, roof areas, building elements, etc. are not impacted by construction activities and debris. If they are damaged, the cost for replacement or repair, if feasible, must be borne by the contractor.

.10 For scaffold access, provide protection to the roof system including at least 2" rigid extruded expanded polystyrene insulation and 3/4" plywood properly secured against wind uplift. The contractor is to ensure existing building loads are not exceeded and that any applied loads are sufficiently distributed; where possible, the scaffold system should span roof areas. Given the presence of interior finishes, it should be assumed that shoring of the roof framing is not feasible. Scaffold design should include cribbing to spread the load over a large area and the total load must be less than the snow load.

.11 Provide all necessary temporary protection to ensure the building remains in a water tight condition and protected from all external environmental elements.

.12 At window replacement locations, provide enclosures at locations where the installation of the new window will be at a later date than the removal of the existing window. The enclosures are to provide adequate control that meets DDSB requirements and the following:

.1 Under all circumstances:

.1 Security to prevent unlawful entry

.2 Classroom thermal comfort when construction extends into October and beyond: if replacing the function of the original opaque wall assembly, the protection enclosure is to be constructed outboard of the classroom heat supply with a minimum R-Value of R13.

.3 Air barrier that is continuous to prevent the uncontrolled airflow between the interior and exterior.

.4 Dust/debris control.

.2 When classrooms are occupied by students, requirements are to achieve those as outlined in the item above, plus:

.1 Security – meet guard loads as outlined in current OBC

.2 Interior surface flame spread that meet current OBC requirements

.3 Lighting to meet DDSB classroom requirements and/or modification of the enclosures to provide adequate lighting

.4 Heat Control (minimum R13 when construction extends into October and beyond)

.13 Working Around Existing Trees and Tree Protection:

.1 Determine construction access path, staging and stockpiling areas and prepare soft ground for mini-excavator passage as follows:

.1 Mini-excavator access to the building, stockpiling areas, and staging are to be located outside the drip line of trees wherever possible.

.2 Where the mini-excavator must be driven, turned, or parked below the drip line of any trees on site, two layers of 3/4" plywood must be laid on the surface of the soil to minimize compaction and rutting of mini-excavator. Plywood sheets must be overlapping and secured together so that they do not move with the passage of the excavator.

.3 To restrict the movement of any construction equipment and stockpiling within the drip lines of trees, the path of the excavator is to be delineated using orange-web snow fencing on T-Bars spaced every 6' and tied with #10 gauge galvanized wire, or portable steel construction fencing secured in place.

.4 All stockpiling of soil, materials, bins must be located on existing hard surfaces wherever possible. No construction materials may be stored or parked below the drip lines of trees. Any stockpiling of soil or materials that occurs on existing soft surfaces (sod, soil, bare

screenings) must protect the ground below using the two-layer plywood treatment described above.

.2 All trees within 12m of the work area must be protected using orange-web snow fencing on T-Bars spaced every 6' and tied with #10 gauge galvanized wire.

.4 Demobilization and Site Clean-up

.1 Demobilize all plant, tools, equipment and labour for this Work from site. Upon completion of Work, and immediately before the Consultant's final review for Total Performance of the work, all areas of the building affected by this Contract shall be thoroughly cleaned. Include the dismantling and removal of the scaffolding at the completion of the project. Remove all temporary protection, equipment, waste and surplus materials from site and leave in neat, tidy condition to the satisfaction of the Owner.

.2 Make good any building elements incidentally affected by the Work including access equipment, furnishings, etc.

.3 Make good any landscaping and landscaping elements (asphalt, concrete sidewalk, sod, bushes, fencing, fence posts, etc.) damaged or removed during repairs. Replace damaged asphalt with hot-mix asphalt, and replace damaged grass with new sod.

.5 Glazing System Replacement

.1 The existing windows will be replaced with a thermally broken aluminum curtain wall system with double glazed insulating glazing units. Refer to the drawings.

.2 Provide Professional Engineer stamped shop drawings of the proposed systems for the Consultant's review at the start of the project and prior to commencing with the replacement work. Engineered shop drawings indicating anchorage for wood bucks also shall be submitted if they are used. Window replacement work shall not commence until the shop drawings are marked as reviewed by the Consultant.

.3 The Contractor shall provide all necessary interior and exterior access as required to field measure the existing windows in a timely manner so as to avoid manufacturing delays and ensure that construction can occur during the allotted period. All costs associated with façade access shall be borne by the Contractor.

.4 Note that interior barriers are included in the general requirements. Refer to item 1.6.3.

.5 Following removal of the dust partition, clean the room interior of all construction dust, dirt and debris to the satisfaction of DDSB. Note that if adequate interior dust protection is not provided, the contractor must engage a cleaner to properly clean the rooms; the DDSB custodial staff cannot be relied on for cleaning.

.6 Where affected by the replacement work, the contractor shall remove all existing window coverings, store for reinstatement, and reinstate the existing where removed. Any damage window coverings are to be replaced at no cost to DDSB and to their satisfaction.

.7 Supply and install new glazing system as shown on the drawings. The Contractor shall be responsible for removal and disposal of the existing glazing system, and supply and installation of all new glazing systems and their components to the standards and details described in the Drawings and Specifications provided. Metal panels are to be provided where shown. Louvres are to be replaced where existing. Protective metal screens are

to be replaced where existing. Opaque/frosted glazing is required at washrooms and changerooms. Where the rough opening extends to within 1070mm of the floor finish, the glazing system must be designed for guard loading. Note that custom sized exterior sills are required.

.8 Supply and install new column covers incorporated into the new glazing system complete with a self-adhered membrane and semi-rigid insulation are to be installed at all exterior column locations within the glazing system. The existing is to be removed and disposed of to expose the column.

.9 Supply and install new entrance doors complete with hardware as noted in the hardware schedule. New entrance doors are to be incorporated into and compatible with the glazing system.

.10 The interior sills are to be replaced with a new laminate sill to match the existing dimensions. The finish will be selected from available finishes.

.11 Where there is interior wood trim surrounding the window, replace it with painted wood trim to match the existing.

.12 Supply and install new interior wood column covers as indicated and removed and dispose of the existing.

.13 The Contractor shall also be responsible for providing all other items and materials required in the Drawings and Specifications and as required for proper performance of the glazing system, including all exterior and interior aluminum trim, exterior window sills, spray applied foam insulation, air barrier/vapour retarder transition membrane, shims, and sealant, etc.

.14 Contractor shall also be responsible for removal and re-installation of all existing electrical, mechanical and communication equipment, conduit, junction boxes, etc. removed or relocated.

.15 The Contractor shall be responsible for making good any interior finishes (drywall, plaster, paint, etc.) following completion of the Work for a minimum of 2 feet within the rough opening. Note that several interior partition walls perpendicularly abut the glazing system. The interior partition will require local removal and rebuilding. The interior partition cannot be fastened to the glazing system. Allow for a partition wall extension to the glazing where the partition wall does not meet a mullion. Sealant is to be installed between the partition wall and the glazing system.

.16 Where the interior T-bar ceiling is affected by the glazing system replacement work, locally remove and reinstate as needed to facilitate the work.

.17 Provide and install a mock-up, as per the Specifications, to be reviewed and accepted by Consultant, prior to the start of the glazing system installation.

.6 Exterior Steel Cleaning and Coating

.1 Where the existing steel (angle, lintel, column, etc.) is exposed, clean the existing steel and install new multi-coat coating system. All exposed accessible surfaces are included.

.2 Allow for sealant replacement between the steel columns and the masonry.

.7 Allowances

.1 Mechanical and Electrical Allowance

.1 This includes a contingency for mechanical, electrical and communication system repairs **not** specified in the Contract Documents that are made necessary by the Work, due to conditions that were **not visible** upon, or reasonably inferable from an examination of the site during the bidding period as determined by the Consultant. Unexpended portions of this allowance will be deducted from the Contract Price. Increase in allowance beyond the stipulated amount shall be authorized by a Change Order.

1.7 UNIT PRICES

.1 There are no unit prices.

1.8 ALTERNATIVE PRICES

.1 Glazing

.1 In lieu of glazing G1, supply and install glazing G2.

.2 In lieu of glazing G1, supply and install glazing G3.

.2 Interior Partitions

.1 Where the interior partitions abut the glazing system, supply and install Mullion Mate manufactured by Gordon Architectural + Engineering Solutions (https://www.gordon-inc.com/products/partition-gap-closures/) appropriate for the condition (mullion, glazing, etc.) in lieu of using drywall, studs, etc.

1.9 SEPARATE PRICES

.1 Pedestrian Door Replacement

.1 Remove and replace the existing hollow metal pedestrian door within the work area complete with new hardware per the hardware schedule.

.2 Remove and replace the metal flashing across the door head.

END OF SECTION 01 11 13

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 35 23 – Health and Safety

1.1 SECTION INCLUDES

.1 Safety requirements and adherence.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 SAFETY PLAN

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

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

1.4 RESPONSIBILITY

.1 The Prime Contractor according the Act, is responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.

.2 For purposes of the installation, the restoration contractor shall act as the Constructor (as that role is defined in the health and safety legislation of Ontario, and as such is fully responsible for directing and controlling all installation work and the safety of the work on the jobsite.

.3 As Constructor/Prime Contractor, the restoration contractor shall be fully and solely responsible for ensuring that all applicable occupational health and safety laws, regulations, rules and orders are complied with in the course of the installation. Entry of manufacturer personnel to ensure quality installation in accordance with the manufacturer’s specifications and to perform warranty inspections shall not be for purposes of monitoring the safety of the work at the job site.

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

.5 Should any unforeseen or peculiar safety-related factor, hazard, or condition become evident during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of the Province of Ontario. Advise Consultant verbally and in writing.

1.5 SUBMITTALS

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

.1 Results of site specific safety hazard assessment.

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

.2 Submit copies of reports or directions issued by Federal or Provincial health and safety inspectors.

.3 Submit copies of incident and accident reports.

.4 Submit Material Safety Data Sheets (MSDS) to Consultant.

.5 Consultant will review Contractor's site-specific Health and Safety Plan and provide comments to Contractor within ten (10) days after receipt of plan. Revise plan as appropriate and resubmit plan to Consultant within seven (7) days after receipt of comments from Consultant.

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

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

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

1.6 SAFETY ACTIVITIES

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

.2 Schedule and administer Health and Safety meeting with Consultant prior to commencement of Work.

1.7 POSTING OF DOCUMENTS

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

1.8 CORRECTION OF NON-COMPLIANCE

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

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

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

1.9 WORK STOPPAGE

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

1.10 FIRE PROTECTION

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

.2 Burning rubbish and construction waste materials is not permitted on site.

1.11 VEHICLE MOVEMENTS

.1 A flagperson must always be present to direct vehicular and pedestrian traffic when a construction vehicle is operating both within and beyond the limits of the Contractor's compound whilst on DDSB property.

1.12 EXCAVATED AREAS

.1 Protect all excavated areas from persons falling into area and from water entry/accumulation. Ensure excavated area has a means of drainage. Provide signage to warn all persons of open and excavated area.

END OF SECTION 01 35 23

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 35 26 – Environment Protection

1.1 SECTION INCLUDES

.1 Site fires.

.2 Disposal of wastes.

.3 Drainage.

.4 Site cleaning and plant protection.

.5 Work adjacent to waterways.

.6 Pollution control.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 FIRES

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

.2 Provide supervision, attendance and fire protection measures as directed.

1.4 DRAINAGE

.1 Do not pump water containing suspended materials into waterways, sewer or drainage systems.

.2 Control disposal or runoff of water containing suspended materials or other harmful substances in accordance with local authority requirements.

1.5 ASBESTOS CONTENT

.1 Refer to General Condition Section, Asbestos Management Plan and Owner's instructions.

1.6 POLLUTION CONTROL

.1 Maintain temporary erosion and pollution control features installed under this contract.

.2 Control emissions from equipment and plant to local authority's emission requirements.

.3 Cover or wet down dry materials and rubbish to prevent blowing dust and debris. Provide dust control for temporary roads.

END OF SECTION 01 35 26

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 61 00 – Product Requirements

1.1 SECTION INCLUDES

.1 Product quality, availability, storage, handling, protection, and transportation.

.2 Manufacturer's instructions.

.3 Quality of Work, coordination and fastenings.

.4 Existing facilities.

1.2 RELATED SECTIONS

.1 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 TERMINOLOGY

.1 New: Produced from new materials.

.2 Re-newed: Produced or rejuvenated from an existing material to like-new condition to serve a new or existing service.

.3 Defective: A condition determined exclusively by the Consultant.

1.4 PRODUCT QUALITY

.1 Products, materials, equipment, parts or assemblies (referred to as Products) incorporated in Work: New or Re-newed, not damaged or defective, of best quality (compatible with specification requirements) for purpose intended. If requested, provide evidence as to type, source and quality of Products provided.

.2 Defective Products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective Products at own expense and be responsible for delays and expenses caused by rejection.

.3 Should any dispute arise as to quality or fitness of Products, decision rests strictly with Consultant.

.4 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.

.5 Permanent labels, trademarks and nameplates on Products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.5 AVAILABILITY

.1 Immediately upon signing Contract, review Product delivery requirements and anticipate foreseeable supply delays for any items.

.2 If delays in supply of Products are foreseeable, notify Consultant of such, in order that substitutions or other remedial action may be authorized in ample time to prevent delay in performance of Work.

.3 In event of failure to notify Consultant at commencement of Work and should it subsequently appear that Work may be delayed for such reason, Consultant reserves right to substitute more readily available Products of similar character, at no increase in Contract Price or Contract Time.

1.6 STORAGE AND PROTECTION

.1 Store and protect Products in accordance with manufacturers' written instructions.

.2 Store with seals and labels intact and legible.

.3 Store sensitive Products in weather tight, climate controlled, enclosures in an environment favourable to Product.

.4 For exterior storage of fabricated Products, place on sloped supports above ground.

.5 Cover Products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of Products.

.6 Store loose granular materials on solid flat surfaces in a well-drained area. Prevent mixing with foreign matter.

.7 Provide equipment and personnel to store Products by methods to prevent soiling, disfigurement, or damage.

.8 Arrange storage of Products to permit access for inspection. Periodically inspect to verify Products are undamaged and are maintained in acceptable condition.

1.7 TRANSPORTATION AND HANDLING

.1 Transport and handle Products in accordance with manufacturer's written instructions.

.2 Promptly inspect shipments to ensure that Products comply with requirements, quantities are correct, and Products are undamaged.

.3 Provide equipment and personnel to handle Products by methods to prevent soiling, disfigurement, or damage.

1.8 MANUFACTURER'S WRITTEN INSTRUCTIONS

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

.2 Notify Consultant in writing, of conflicts between specifications and manufacturer's instructions, so that Consultant may establish course of action.

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

1.9 QUALITY OF WORK

.1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Consultant if required Work is such as to make it impractical to produce required results.

.2 Do not employ anyone unskilled in their required duties. Consultant reserves right to require dismissal from site any workers deemed incompetent or careless.

.3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Consultant, whose decision is final.

1.10 COORDINATION

.1 Ensure cooperation of workers in laying out Work. Maintain efficient and continuous supervision.

.2 Be responsible for coordination and placement of openings, sleeves and accessories.

1.11 CONCEALMENT

.1 In finished areas, conceal pipes, ducts and wiring in floors, walls and ceilings, except where indicated otherwise.

.2 Before installation, inform Consultant if there is interference. Install as directed by Consultant.

1.12 REMEDIAL WORK

.1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Coordinate adjacent affected Work as required.

.2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.

1.13 FASTENERS

.1 Provide metal fasteners and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.

.2 Prevent electrolytic action between dissimilar metals and materials.

.3 Use non-corrosive stainless steel fasteners and anchors for securing exterior work.

.4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.

.5 Keep exposed fastenings to a minimum, space evenly and install neatly.

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

1.14 FASTENERS - EQUIPMENT

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

.2 Use heavy hexagon heads, semi-finished unless otherwise specified. Use Type 304 or 316 stainless steel for exterior areas.

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

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

1.15 PROTECTION OF WORK IN PROGRESS

.1 Prevent overloading of any part of the Project.

.2 Do not cut, drill or sleeve any load bearing structural member, unless specifically indicated, without written approval of Consultant.

END OF SECTION 01 61 00

DIVISION 01 – GENERAL REQUIREMENTS

Section 01 62 00 – Product Exchange Procedures

1.1 SECTION INCLUDES

.1 Substitutions.

.2 Alternatives.

.3 Separate prices.

1.2 RELATED SECTIONS

.4 This section describes requirements applicable to all Sections within Divisions 02 to 49.

1.3 SUBSTITUTIONS

.1 Instructions to Bidders specify time restrictions for submitting requests for Substitutions during the bidding period to requirements specified in this section.

.2 Substitutions may be considered when a Product becomes unavailable through no fault of the Contractor.

.3 Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

.4 A request constitutes a representation that the Bidder:

.1 Has investigated proposed Product and determined that it meets or exceeds the quality level of the specified Product.

.2 Will provide the same warranty for the Substitution as for the specified Product.

.3 Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.

.4 Waives claims for additional costs or time extension which may subsequently become apparent.

.5 Will reimburse Owner for review or redesign services associated with re-approval by authorities.

.5 Substitutions will not be considered when they are indicated or implied on shop drawing or product data submittals, without separate written request, or when acceptance will require revision to the Contract Documents.

.6 Substitution Submittal Procedure:

.1 Submit request for Substitution for consideration electronically complete with accompanying technical data and manufacturer information; provided submission but clearly indicate that the substitution is an equivalent material/product/system. Note that if insufficient information is provided, the substitution will be rejected.

.2 Limit each request to one (1) proposed Substitution.

.3 Submit shop drawings, product data, and certified test results attesting to the proposed Product equivalence. Burden of proof is on proposer.

.4 Submit the above-mentioned information a minimum of ten days prior to the tender closing time.

.5 The Consultant and/or Owner will notify Contractor in writing of decision to accept or reject request.

1.4 ALTERNATIVES

.1 Accepted Alternatives will be identified in Owner-Contractor Agreement.

.2 Submit alternatives identifying the effect on adjacent or related components.

.3 Alternatives quoted on Bid Forms will be reviewed and accepted or rejected at the Owner's option. Accepted alternatives will be identified in the Owner-Contractor Agreement.

.4 Coordinate related work and modify surrounding work to integrate the Work of each alternative.

1.5 SEPARATE PRICES

.1 Separate Price items do NOT replace or substitute items already in the Bid Documents. Accepted Separate Prices will be:

.1 Identified in the Construction Agreement as an increase to the Bid Price; or

.2 In a subsequent Change Order.

.2 Submit Separate Prices to identify items that may be added to the Contract, at the Owner's option. Include in the quoted Separate Price, overhead and profit, the effect on adjacent or related components already in the Work described in the Bid Documents.

.3 Coordinate related Work and modify surrounding Work to integrate the work of each Separate Price.

.4 Schedule of Separate Prices: Refer to Bid Form or Supplementary Bid Information Form.

END OF SECTION 01 62 00

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

Section 07 90 00 – Sealant

1.0 GENERAL

1.1 SECTION INCLUDES:

.1 Sealant

1.2 GENERAL REQUIREMENTS

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

1.3 REFERENCES

.1 ASTM C 510 Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.

.2 ASTM C 661 Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer

.3 ASTM C 719 Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).

.4 ASTM C 794 Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants.

.5 ASTM C 920 Standard Specification for Elastomeric Joint Sealants.

.6 ASTM C 1193 Standard Guide for Use of Joint Sealants.

.7 ASTM C 1248 Standard Test Method for Staining of Porous Substrate by Joint Sealants.

.8 ASTM C 1311 Standard Specification for Solvent Release Sealants.

.9 ASTM D 2203 Standard Test Method for Staining from Sealants.

.10 ASTM D 2240 Standard Test Method for Rubber Property—Durometer Hardness

.11 ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Materials

1.4 SUBMITTALS

.1 Two (2) weeks prior to starting the work, the contractor shall submit the following:

.1 List of the materials to be provided under this section.

.2 Manufacturer's product data and specifications for each material.

.3 Sealant manufacturer's written project recommendations.

.2 At the Consultant's request, submit samples, including available colours, of the materials to be used on the project.

1.5 QUALITY ASSURANCE

.1 Perform the work in accordance with the manufacturer's written project recommendations.

.2 Obtain each type of joint sealant through one source from a single manufacturer.

1.6 QUALIFICATIONS

.1 The installation of the sealant work shall be performed by a recognized specialized applicator, having at least five (5) years of experience, with skilled mechanics, thoroughly trained and competent in all phases of the work.

1.7 MOCK-UP

.1 Construct mock-ups two (2) weeks prior to commencement of the work to demonstrate all of the joints encountered in this project.

.2 The mock-ups shall be 1 m in length for each type of sealant and substrate.

.3 The mock-ups shall demonstrate the surface preparation prior to the sealant installation and the location, size, shape, colour, depth of joints, and adhesion and cohesion, complete with back-up material, primer, and new sealant.

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

.5 The approved mock-up shall be the standard to which all work shall be performed.

.6 The mock-up shall be performed prior to the pre-installation conference.

1.8 DELIVERY, STORAGE AND PROTECTION

.1 Deliver all materials to the job-site in their original unopened containers with labels indicating manufacturer, product name and designation, colour, expiration date, pot life, curing time, and mixing instructions for multi-component materials.

.2 Store all materials in strict accordance with the manufacturer's recommendations.

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

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

.5 Remove rejected or contaminated materials from the site.

1.9 ENVIRONMENTAL REQUIREMENTS

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

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

1.10 ALTERNATIVES

.1 Alternatives to manufacturer's brands or supply sources of materials will not be accepted.

1.11 WARRANTY

.1 The Contractor shall submit a full labour and material warranty against defective workmanship or materials that result in water penetration, material incompatibility, material failure, system failure, etc. for a period of two (2) years from the date of Substantial Performance of the Contract.

.2 Warranty coverage to include the repair of any premise/content property damaged as a result of failure.

.3 The warranty is to be supplied on official company letter head and shall bear the corporate seal.

1.12 ANTICIPATED FIELD TESTING PROGRAM

.1 Material and adhesion tests shall be conducted at the discretion of the Consultant on a random basis to show that properties are appropriate to the particular sealant and proper bond is achieved.

.2 Extent of testing shall be as follows:

.1 Ten (10) tests for the first 1 000 feet (300 m) of joint length for each type of elastomeric sealant and joint substrate.

.2 One (1) test for each 1 000 feet (300 m) of joint length therefore or one test per each floor per elevation.

.3 The Contractor shall repair all test areas as part of the work in accordance with this section.

.4 All sealant installation failing material and adhesion tests shall be rectified in accordance with manufacturer and Consultant approved methods. Rectified areas will be retested until results confirm compliance with the manufacturer's written requirements.

2.0 PRODUCTS

2.1 SEALANT

.1 Substrates not in contact with bituminous materials:

.1 DOWsil 795 Building Sealant.

.2 Curtain wall and window joints:

.1 DOWsil 790 Building Sealant.

.3 Interior sealant joints:

.1 Tremco Tremflex 834

.4 Substrates in contact with bituminous membranes:

.1 925 BES Sealant by Henry Company.

.5 Substrates in contact with roofing membranes and asphalt materials:

.1 M1 by Chemlink.

2.2 PRIMERS

.1 Primer shall be as specified by the sealant manufacturer.

2.3 CLEANING AGENT

.1 The cleaning material for the surfaces to receive the sealant shall be as recommended by the manufacturer of the sealant.

2.4 MASKING TAPE

.1 Non-staining, non-absorbent material compatible with joint sealant and surface adjacent to joints.

3.0 EXECUTION

3.1 EXAMINATION

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

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

.3 Examine the areas and conditions under which the work will be performed. Review the planned operating procedures with the Consultant. Do not proceed with work until any unsatisfactory conditions are corrected in a manner acceptable to both the Owner and the Consultant.

.4 Verify that the specified environmental conditions exist before commencing with the work.

.5 The Contractor shall arrange for the sealant Manufacturer's representative to visit the site and review the surface preparation and installation procedures at the start of the work.

3.2 PROTECTION

.1 The Contractor is responsible for maintaining the work weather tight during the course of the project. At the end of each work day or when stoppage occurs, provide necessary protection to prevent water penetration through the exterior walls.

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

.3 Protect adjacent finished materials from marking or damage during the work.

.4 Protect completed sealant installation during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes such that sealant is without deterioration or damage at time of substantial completion. If, despite such protection, damage or deterioration occurs, such sealant shall be rectified immediately.

3.3 SURFACE PREPARATION

.1 Consult and follow the sealant manufacturer's project recommendations.

.2 Remove the existing sealant around the penetrations without causing damage to the substrates.

.3 Remove dust, paint, loose mortar and other foreign matter, and dry joint surfaces.

.4 Where necessary to protect the adjacent surfaces, mask by suitable means prior to priming and sealant installation.

.5 Report in writing to the Consultant, any conditions which may be detrimental to the proper performance of the work. Proceeding with the work shall be taken as acceptance of the existing surfaces and conditions.

.6 The joints shall be clean, dry and free of frost and foreign matter prior to surface application.

.7 Butt and Bridge Joint Applications

.1 Examine the joint sizes and correct as required to allow for the anticipated movement and to achieve proper width / depth ratio in accordance with the manufacturer's recommendations for the specified sealant unless indicated differently on the drawings, or by the Consultant.

.2 Should joint width correction be required, ensure that the correction is distributed appropriately to each side of joint.

.8 Fillet Joint Applications

.1 Remove oil, grease and other coatings from non-ferrous metals with an approved cleaning solvent or abrasive technique. Obtain approval from the Consultant prior to commencing.

3.4 PRIMING

.1 Prime all substrates as directed by the sealant manufacturer's recommendations.

.2 Prime sides of the joint using the two-cloth method in accordance with the manufacturer's directions, immediately prior to sealant installation.

.3 Primers that require application by the wipe of a clean soft cloth, shall be poured onto the cloth. Do not dip the cloth into the primer container.

.4 Prime only as much area as can be sealed in the same working day.

3.5 APPLICATION

.1 The Contractor shall have a trained representative on site at all times who is responsible for all sealant applications.

.2 Perform all work in strict accordance with the manufacturer's printed instructions. The Contractor shall provide the Consultant a copy of these instructions prior to commencing with the injection and sealing operations.

.3 Mix multi-component sealant such that air pocket formation is minimized in accordance with the manufacturer's recommendation.

.4 The sealant must be applied continuously to ensure that all voids and joints are completely filled.

.5 Tool the sealant with light pressure immediately after application to ensure positive and complete contact of the sealant to the interface. Only tooling agents that are approved in writing by the sealant manufacturer and that do not discolour sealants or adjacent surfaces shall be used.

.6 Neatly tool the surface to form a slight concave profile. The surface of the sealant shall be smooth, free from ridges, wrinkles, air pockets and embedded impurities.

3.6 CLEAN UP

.1 Clean the adjacent surfaces immediately and leave the work area neat and clean. All excess (sealant and primer) and droppings shall be removed using the recommended cleaners as the work progresses.

.2 All masking shall be removed immediately after tooling the joints. Sealant affected by the masking removal shall be retooled to achieve proper joint configuration.

END OF SECTION 07 90 00

DIVISION 8 – ENTRANCES, STOREFRONT AND CURTAIN WALLS

Section 08 11 00 – Metal Doors and Frames

1. GENERAL

1.1 SECTION INCLUDES

.1 Hollow metal doors and frames.

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM)

.1 ASTM A653/A653M, Specification for Steel Sheet Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot Dip Process.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.181, Ready-Mixed Organic Zinc-Rich Coating.

.2 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA)

.1 G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA W59, Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door Manufacturers' Association, (CSDMA).

.1 CSDMA, Specifications for Commercial Steel Doors and Frames.

.2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors.

.5 National Fire Protection Association (NFPA)

.1 NFPA 80, Standard for Fire Doors and Fire Windows.

.2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC)

.1 CAN4-S104M, Fire Tests of Door Assemblies.

.2 CAN4-S105M, Fire Door Frames Meeting the Performance Required by CAN4-S104.

.3 CAN/ULC-S701, Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.4 CAN/ULC-S702, Thermal Insulation, Mineral Fibre, for Buildings.

.5 CAN/ULC-S704, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.3 DESIGN REQUIREMENTS

.1 Design door assembly to withstand minimum 1,000,000 swing cycles in accordance with ANSI A151.1, with no failure of any design features of the door.

.2 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35˚C to 35˚C.

.3 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

.4 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 and NFPA 252 for ratings specified or indicated.

.5 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and NFPA 252 and listed by nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.4 SUBMITTALS

.1 Two (2) weeks prior to the commencement of work, submit one (1) samples of each door type to be used on the project for approval by the Owner.

.2 All samples must be delivered on site directly to the Consultant.

.3 Provide door shop drawings for review by the Owner prior to ordering the door.

.4 Shop drawings are to indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, louvred, arrangement of hardware and fire rating and finishes.

.5 Shop drawings are to indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing fire rating and finishes.

.6 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

.7 Submit one 300 x 300 mm top corner sample of each type door.

.8 Submit one 300 x 300 mm corner sample of each type of frame.

.1 Show butt cutout, glazing stops.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver, handle and store doors and frames at the job site in such a manner as to prevent damage.

.2 Store doors and frames under cover with doors stored in a vertical position on blocking, clear of floor and with blocking between doors to permit air circulation.

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

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

.5 Remove rejected or contaminated materials from the site.

1.6 QUALIFICATIONS

.1 The installer shall be a company specializing in related work with a minimum of five (5) years proven experience for projects of similar size and complexity.

1.7 QUALITY ASSURANCE

.1 Conform to requirements to ANSI A117.1

1.8 WARRANTY

.1 The Contractor shall submit a full labour and material warranty against defective workmanship or materials that result in water penetration, material incompatibility, material failure, system failure, etc. for a period of two (2) years from the date of Substantial Performance of the Contract.

.2 Warranty coverage to include the repair of any premise/content property damaged as a result of failure.

.3 The warranty is to be supplied on official company letter head and shall bear the corporate seal.

1.9 ENVIRONMENTAL REQUIREMENTS

.1 General:

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

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

2. PRODUCTS

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A653/A653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/A653M, ZF75.

2.2 DOOR CORE MATERIALS

.1 Stiffened: face sheets welded insulated core.

.1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m³.

.2 Polyurethane: to CAN/ULC-S704 rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m³.

.2 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250˚C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

.3 Thermal Insulation material must:

.1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.

.2 Be manufactured using a process that uses chemical compounds with the minimum zone depletion potential (ODP) available.

2.3 ADHESIVES

.1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.

2.4 PRIMER

.1 Touch-up prime CAN/CGSB-1.181.

2.5 ACCESSORIES

.1 Door silencers: single stud rubber/neoprene type.

.2 Exterior top and bottom caps steel.

.3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Door bottom seal: Section 08 71 00 – Door Hardware.

.5 Metallic paste filler: to manufacturer's standard.

.6 Fire labels: metal riveted.

.7 Sealant: Section 07 90 00 – Joint Sealants.

.8 Provide low expanding, single component polyurethane foam sealant installed at head and jamb perimeter of door frame for sealing to building air barrier, vapour retarder and door frame. Foam sealant width to be adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder foam interior.

.9 Finish Painting: to Section 09 91 13 – Exterior Coatings and Section 09 91 23 – Interior Painting.

2.6 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Fabricate frames to profiles and maximum face sizes as indicated.

.3 Exterior frames: 1.2 mm welded, thermally broken type construction.

.4 Interior frames: 1.2 mm welded type construction.

.5 Blank, reinforce, drill and tap frames for mortised, template hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.6 Protect mortised cutouts with steel guard boxes.

.7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.

.8 Manufacturer's nameplates on frames and screens are not permitted.

.9 Conceal fastenings except where exposed fastenings are indicated.

.10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.

.11 Insulate exterior frame components with polyurethane insulation.

2.7 FRAME ANCHORAGE

.1 Shim and anchor new doors in accordance with CAN/CSA A440.4.

.2 Provide appropriate anchorage to floor and wall construction.

.3 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.

.4 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.

.5 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.8 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.

.3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.

.4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.

.5 Securely attach floor anchors to inside of each jamb profile.

.6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.

2.9 DOOR FABRICATION GENERAL

.1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.

.2 Exterior doors: insulated, hollow steel construction. Interior doors: honeycomb hollow steel construction.

.3 Fabricate doors with longitudinal edges locked seam. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

.4 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.

.5 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.

.6 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.7 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

.8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

.9 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104 ASTM E152 NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

.10 Manufacturer's nameplates on doors are not permitted.

2.10 HOLLOW STEEL CONSTRUCTION

.1 Form each face sheet for exterior doors from 1.2 mm sheet steel.

.2 Form each face sheet for interior doors from 1.2 sheet steel.

.3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.

.4 Fill voids between stiffeners of exterior doors with insulation as specified.

.5 Fill voids between stiffeners of interior doors with honeycomb core.

2.11 THERMALLY BROKEN DOORS AND FRAMES

.1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.

.2 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

.3 Fabricate thermally broken frames separating exterior parts form interior parts with continuous interlocking thermal break.

.4 Apply insulation.

3. EXECUTION

3.1 INSTALLATION GENERAL

.1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.2 Install doors and frames to CSDMA Installation Guide.

3.2 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation.

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader 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 allowances for deflection of structure to ensure structural loads are not transmitted to frames.

.5 Install sealant at the perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air barrier and vapour retarder.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor as follows.

.1 Hinge side: 1.0 mm.

.2 Latch side and head: 1.5 mm.

.3 Finished floor: 13 mm.

.3 Adjust operable parts for correct function.

.4 Install louvres.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

.2 Fill exposed frame anchors and surfaces with imperfections with metallic paste filler and sand to a uniform smooth finish.

3.5 COMMISSIONING

.1 Contractor to instruct maintenance personnel in operation and maintenance of doors and hardware.

.2 Confirm operation and function for all doors and hardware.

.3 Commissioning will be witnessed by Owner and Certificate will be signed by Contractor and Owner.

END OF SECTION 08 11 00

DIVISION 08 – OPENINGS

Section 08 44 13 – Glazed Aluminum Curtain Wall

1.0 GENERAL

1.1 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA)

.1 AAMA CW-10-15, Care and Handling of Architectural Aluminum From Shop to Site.

.2 AAMA CW-11-85, Design Wind Loads and Boundary Layer Wind Tunnel Testing.

.3 AAMA TIR-A1-15, Sound Control for Fenestration Products.

.4 AAMA 501-15, Methods of Test for Exterior Walls.

.5 AAMA 611-14, Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.6 AAMA 612-17a, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.

.7 AAMA 2603-17a, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.8 AAMA 2604-17a, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 ASTM International (ASTM)

.1 ASTM A36/A36M-14, Specification for Carbon Structural Steel.

.2 ASTM A123/A123M-17, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

.3 ASTM A653/A653M-18, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.4 ASTM B209-14, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.5 ASTM B221-14, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.6 ASTM E283-04(2012), Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.7 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.

.8 ASTM E331-00(2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.9 ASTM E413-16, Classification for Rating Sound Insulation.

.10 ASTM E1105-15, 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.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.

.5 CSA Group (CSA)

.1 CSA G40.20-13/G40.21-13(R2018), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.

.2 CSA S136/S136.1-16, North American Specification for the Design of Cold Formed Steel Structural Members.

.3 CAN/CSA-S157/S157.1-17, Strength Design in Aluminum/Commentary on CAN/CSA-S157, Strength Design in Aluminum.

.4 CSA W59.2-18, Welded Aluminum Construction.

.6 Master Painters Institute (MPI)

.1 Architectural Painting Specification Manual - current edition.

.1 MPI #79, Primer, Alkyd, Anti-Corrosive for Metal.

.7 National Research Council Canada (NRC)

.1 National Building Code of Canada 2015 (NBC).

.8 Society for Protective Coatings (SSPC)

.1 SSPC - Paint 20-02(R2004), Zinc Rich Primers Inorganic and Organic.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets for curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Submit two (2) copies of WHMIS MSDS to the Consultant and Project Supervisor.

.2 Test Reports:

.1 Submit substantiating engineering data, test results of previous tests by an independent laboratory which purport to meet performance criteria, and supportive data. Reports shall be less than five (5) years old.

.2 All test reports are to be based on AAMA 501 indicating conformance to design and performance requirements, performed by an AAMA qualified North

American independent testing laboratory within the past five (5) years. The report must include at minimum:

.1 Pre-load: Load the test assembly to 0.5 times the specified design wind pressure and inspect the assembly for detrimental effects.

.2 Static Pressure Air Infiltration: To ASTM E283-04(2012) Standard Test Method for Rate of Air Leakage.

.3 Static Pressure Water Infiltration: To ASTM E331-00(2016) Standard Test Method for Water Penetration by Uniform Static Air Pressure Difference.

.4 Dynamic Pressure Water Infiltration: To AAMA 501.1-17, Standard Test Method for Water penetration of Windows, Curtain Walls, and Doors Using Dynamic Pressure.

.5 Structural Loads: To ASTM E330/E330M-14 Structural Performance by Uniform Static Air Pressure Difference, to 75% and 100% of design load. Record deflection at 75% load. Hold pressure for sixty (60) seconds.

.6 Repeat Static Pressure Air Infiltration.

.7 Repeat Static Pressure Water Infiltration.

.8 Condensation Resistance / Thermal Cycling: five (5) cycles, one (1) held for condensation resistance test.

.9 Supporting Structure Displacement: The anticipated design displacement or deflection will be simulated for the supporting condition of the mockup. Three (3) cycles of movement.

.10 Structural Proof Loads: To ASTM E330/E330M-14, Structural performance by Uniform Static Air Pressure Difference, to 150% of design loads. Record permanent set. Hold pressure for ten (10) seconds.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer licensed in the province of Ontario, Canada.

.2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, junction between combination units, interior and exterior trim, elevations of unit, location of isolation coating, description of related components and exposed finishes, fasteners, and caulking. Indicate location of manufacturer's nameplates.

.3 Indicate system dimensions, framed opening requirements and tolerances, adjacent construction, anchor details anticipated deflection under load, affected related Work, weep drainage network, expansion and contraction joint location and details, and field welding required.

.4 Fastening of wood bucks to building structure to be included in curtain wall shop drawings or to be submitted as a separate engineered shop drawing confirming that the wood bucks can support the curtain wall lateral loads.

.5 Indicate locations, dimensions, openings and requirements of related work.

.6 Do not order materials or start fabrication until shop drawings have been reviewed.

.4 Samples:

.1 Submit for review and acceptance of each unit.

.2 Samples will be returned for inclusion into work.

.3 Submit one (1) complete full-size window sample of each window type.

.1 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.

.4 Include 150 mm (6") long samples of head, jamb, sill and intermediate mullion to indicate profile.

.5 Submit one 305mm (12") long sample of each muntin profile proposed for the project, if applicable, complete with manufacturer's product sheet and adhesive tape product sheet.

1.3 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for glazed aluminum curtain wall for incorporation into manual.

.2 As-Built drawings: Submit "As-Built" drawings to the Consultant at the completion of work. As-Built drawings are to legibly record all actual construction which deviates from the project drawings; using red-lines on black-line prints of the project drawings.

.3 Warranty Documentation: submit warranty documents specified.

1.4 QUALITY ASSURANCE

.1 Work of this section is to be done by Manufacturers of recognized standing, having personnel with minimum five (5) years experience in successful manufacture and installation of work specified herein, and who have the necessary equipment to carry out the work.

.2 Fabrication of curtain wall to be done by the curtain wall manufacturer.

.3 Installation shall be by the curtain wall manufacturer or their approved installer using only mechanics skilled in this trade and in sealant trade as applicable.

.4 Certifications: Submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements

.5 Mock-ups:

.1 Provide site mock-up for work of this Section indicating methods and materials, and procedures proposed to achieve final results and to comply with following requirements, using materials indicated for completed work:

.1 Build mock-ups in location and of size as directed by the Consultant.

.2 Build a separate mock-up for each curtain wall type/configuration in the project.

.3 Mock-up to include review of:

.1 Rough Opening preparation.

.2 Curtain wall frame installation.

.1 Curtain wall anchors

.2 Vision glass lite

.3 Operable vents

.4 Column cover

.5 Expansion joint

.3 Air/Vapour barrier installation.

.4 Glazing and Sealant installation.

.4 To properly review all of the items listed above, the mock up will need to be reviewed by the Consultant at multiple stages during the installation. The Contractor is to allow 24 hours for review of mock-up by the Consultant before proceeding with the work. The Contractor is to provide the Consultant with 48 hours notice for mock-up review.

.5 Obtain Consultant's acceptance of mock-ups before starting construction; mock-up will be used throughout the construction period as standard of acceptance for subsequent work.

.2 Mock-up may form part of permanent structure when accepted by the Consultant. The Contractor is to repair or replace unacceptable mock-ups at no additional cost to Owner.

.6 Inspection and Testing:

.1 Windows are to be tested in accordance with Section 01 45 24 – Glazing Testing.

.2 A minimum of two (2) curtain wall sections of each curtain wall type are to be tested.

.1 Approved curtain wall mock-up for each curtain wall type/configuration and;

.2 One (1) curtain wall section for every 20 curtain wall sections of each type as directed by the Consultant.

.3 The fixed and operable portions of a curtain wall system are to be tested separately for air leakage.

.4 In the event of a failed air leakage and water penetration test, the Contractor shall complete the necessary remedial work and retest the curtain wall until the system passes. This shall be done at no cost to the Owner.

.1 Once the failed curtain wall test section has passed the air leakage and water penetration test, the remedial work performed on the failed curtain wall is to be completed on all of the remaining curtain wall of that type.

.7 Once a curtain wall section has failed its initial test, an additional curtain wall section shall be chosen by the Consultant to be tested once the remedial work has been carried out on all of the curtain wall sections.

.8 The mock-up is to be considered complete once it has passed the on site air leakage and water penetration testing

1.5 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Handle work of this Section in accordance with AAMA CW-10.

.2 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.3 Store and protect aluminum glazed curtain wall components from nicks, scratches, and blemishes.

.4 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.

.5 Replace defective or damaged materials with new.

1.6 WARRANTY

.1 Manufacturer's warranty: Submit, for Consultant acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty in addition to and not limit other rights Owner may have under Contract Documents.

.2 The Contractor is to warrant work of this Section against defects and deficiencies for a period of five (5) years from the date the Work is certified as substantially performed in accordance with the General Conditions of the Contract and as amended by the Supplementary General Conditions.

.3 The Contractor is to promptly correct deficiencies which become apparent within the warranty period without cost to the Owner. Defects shall include, but not limited to, leaking, deformation of members, loss of seal in sealed glass units, breakage of glass caused by frame distortions and thermal forces, mechanical failure and discolouration of finishes.

2.0 PRODUCTS

2.1 SYSTEMS

.1 Description:

.1 Vertical glazed aluminum curtain wall system includes thermally broken tubular aluminum sections with self supporting framing, shop fabricated, factory prefinished, and vision glass including operable vents; related flashings, anchorage and attachment devices.

.2 Assembled system to permit re-glazing of individual glass (and infill panel) units from exterior without requiring removal of structural mullion sections.

.2 Performance Requirements:

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of system as calculated in accordance with applicable codes.

.2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with applicable codes.

.3 Design curtain wall framing and connections to substrate, where the bottom of the curtain wall extends to a point below 1070mm (3'-6") above finished floor level and separates a floor level from an adjacent interconnected space, to withstand the required guard and handrail loads in accordance with the OBC and applicable local regulations. Compliance with guard and handrail requirements is to be indicated on the sealed shop drawings.

.4 Limit horizontal and vertical mullion deflection to less than L/175 and 19mm maximum for heights under 4115mm and L/240 and 25mm maximum for heights over 4115mm. Prevent deflection and permanent or progressive glazing displacement and allow for full recovery of glazing materials.

.5 For vertical and horizontal glazing members, the reduction of glass bite shall not exceed 3mm (1/8") at mid-span of any glass lite due to member deflection. Deflection limits to be such that the integrity of the glass and air seals are maintained at design loading. Permanent deformation of members due to applied loads are not permitted.

.6 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.7 Ensure system is designed to accommodate the following without damage to components or deterioration of seals:

.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Shortening of building concrete structural columns.

.6 Creep of concrete structural members.

.7 Mid-span slab edge deflection of 6mm (1/4").

.8 Maximum U values of curtain wall assemblies (including frame, edge, centre of glass and spandrel effects) conditions shall be based on winter design night-time air temperatures and shall be as follows:

.1 Typical curtain wall vision area shall have a maximum U value of 1.99W/m^2 hr K

.2 Typical curtain wall spandrel area shall have a maximum U value of 1.0W/m^2 hr K

.9 Acoustic:

.1 Sound transmission class (STC) of curtain wall system (exterior to interior) shall not be less than 35, when tested in accordance with ASTM E90.

.2 Sound transmission class (STC) of party walls and floor including the fire stopping and smoke seals system at the slab edges and at the demising walls shall not be less than 45 when tested in accordance with ASTM E336.

.10 Limit air infiltration through assembly to 0.3 L/s $m^2$of wall area, measured at a reference differential pressure across assembly of 300 Pa as measured in accordance with ASTM E283.

.11 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: no failure.

.12 Static water penetration: none, when tested in accordance with ASTM E331 under a static pressure difference of 700 Pa for a period of fifteen (15) minutes.

.13 Dynamic water penetration: none when tested in accordance with AAMA 501 under a dynamic pressure difference of 700 Pa for a period of fifteen (15) minutes.

.14 Static Structural performance test in accordance with ASTM E330. Design load for testing shall be taken as the greater of applicable wind design loads and PSOS requirements.

.15 Condensation resistance/thermal cycling test consisting of at least five (5) cycles ranging from -18°C to 60°C exterior and 21°C interior. One (1) cycle shall be maintained at the design winter exterior temperature for a period sufficient to allow temperatures within the test assembly to stabilize. Maintain air pressure differential of 15Pa between the top and bottom surfaces in the cold drainage chamber so to create air flow through the chamber. Thermocouples are to be placed on interior and exterior surfaces to record surface temperatures. As a minimum, interior thermocouples are to be placed on coldest expected surfaces as determined by computer simulations. Exterior thermocouples are to be placed in exterior chambers. At interior design conditions (69.8°F (21°C), 45% RH) minimize condensation on room side surfaces. Testing to be performed in accordance with AAMA 501.

.16 Ensure system allows for expansion and contraction within system components when temperature range is 95 degrees C over 12 hour period without causing detrimental affect to system components.

.17 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to exterior by weep drainage network.

.18 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.1 Position thermal insulation on exterior surface of air barrier and vapour retarder.

.19 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system occur.

2.2 MATERIALS

.1 Extruded aluminum: to ASTM B221/B221M, AS6063-T6, alloy and temper for framing, and otherwise where not exposed to suit specified and fabricator's requirements. Exposed surfaces of aluminum to be free of die marks, scratches, blisters, "leave-off" marks, or other blemishes, whether left unfinished or finished.

.2 Sheet aluminum: to ASTM B209, AA1100-H14 or AA3003-H14 alloy.

.3 Sheet steel: to ASTM A653/A653M; zinc coated (galvanized) sheet steel with metallic designation Z275 (G90), minimum 1.0 mm thickness.

.1 For back pans up to 2.3 m^2: minimum 100 mm deep, top hat section, glazing adapter section, bird beak section or box section, with corners sealed with one component butyl sealant.

.2 Over size back pans: for back pans greater than 2.3 m^2, custom fabricated with integrated stiffener system

.4 Steel sections: to CSA G40.20/G40.21; shaped to suit mullion sections.

.5 Anchors: 3-way adjustable hot-dip galvanized steel.

.6 Fasteners:

.1 300 series stainless steel to meet window requirements and as recommended by the manufacturer.

.2 Use only concealed fasteners.

.3 Where fasteners cannot be concealed, countersunk screws finished to match adjacent material may be used upon receipt of written approval from Consultant.

.7 Isolation Coating:

.1 Bituminous paint in accordance with CAN/CGSB 1.108, Type 1, without thinner.

.2 Isolate aluminum from following components, by means of isolation coating:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood

.8 Exterior Metal Sills:

.1 Extruded aluminum of type and size to suit job conditions; minimum 2mm thick complete with joint covers, jamb drip deflectors, chairs, anchors and anchoring devices.

.9 Flashings and Trims:

.1 3.2mm pre-finished factory formed aluminum to match curtain wall mullion sections where exposed. Flashings and trims to be mechanically fastened and thermally separated from the interior tubular curtain wall section.

.10 Glazing:

.1 Refer to Section 08 80 00 for glazing and accessories.

.11 Swing Doors:

.1 Medium stile door, thermally broken with mechanically fastened and welded corners and dual weatherstripping and bulb gaskets . Doors to accept 25mm (1”) insulating glazing unit infill.

.12 Insulated Metal Panels

.1 Refer to Section 08 80 00 Glazing

.13 Louvres

.1 DE439 extruded drainable louvers feature alloy 6063-T5 extruded 4” aluminum blades positioned at a 39° angle, optimizing air performance and water penetration ratings with vertical and horizontal gutter systems that capture droplets and prevent entrainment in the air stream.

.2 Louvres to include as a minimum:

.1 Drainable blade with vertical jamb gutter

.2 All welded construction

.3 0.081" (2 mm) extruded aluminum blades and frames

.4 Nominal 55.1% free area, based on 48" x 48" (1219 mm x 1219 mm) louver

.5 Integral perimeter caulking stop

.6 Insect screen

.14 Sealant:

.1 Refer to Section 07 90 00 – Sealants.

.15 Air Barrier/Water Resistant/Vapour Barrier Membrane

.1 Liquid Membrane:

.1 Acceptable for the rough opening perimeter provided gaps are less than 13mm.

.2 Air Bloc LF by Henry Company

.1 925 BES Sealant to fill gaps up to 13mm

.2 Sheet Membrane:

.1 Acceptable for the rough opening perimeter and transition onto the curtain wall shoulder.

.2 Air and vapour barrier 3015 by 3M

.3 Blueskin SA by Henry Company

.3 Pre-engineered aluminum extrusion adapter, silicone rubber extrusion sheet runs and corners, sealant tape secondary seal, and sealant.

.1 Tremco Proglaze ETA (Engineered Transition Assembly)

.2 DOWSIL Silicone Transition Strip by DOW Chemical Company

.16 Foam Insulation Sealant:

.1 All voids between perimeter aluminum window frames and window rough opening to be filled with liquid foam insulation - Single Component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1

.2 Acceptable Products: CF-I XTW Extreme-Weather Insulating Foam by Hilti or equal

.17 Semi-Rigid Insulation:

.1 To ASTM C612

.2 Type: 1VB

.3 Density: 64 kg/m^3 (4 lbs/ft^3)

.4 Thickness: 100mm (4") minimum.

.5 Acceptable material: CurtainRock by Roxul Inc. or equal.

.18 Interior Sills

.1 Plastic laminate sill to consist of 19mm stool and apron with dimensions to match the existing.

.2 Plastic laminate:

.1 1.6mm (0.062") thick, general purpose grade for flatwork and 1.25mm (0.050") thick standard postforming grade for shaped profiles and bends.

.2 Finish to be selected by the Owner and Consultant from the manufacturer's standard range.

.3 Balancing sheet shall be the same thickness as the surface sheet and shall be supplied by the same manufacturer.

.4 Standard patterns and wood grain colours to be selected by the Owner and Consultant from the manufacturer's standard range.

.5 Acceptable manufacturers: Arborite, Formica, Nevamar, Wilsonart, Lamitech or Pionite, confirming to CAN3-A172.

.3 Adhesives:

.1 Formulated for use in decorative laminate fabrication and to suit the conditions of application without failure.

.2 Adhesive conforming to CSA O112 Series, no added urea formaldehyde; Greenguard Gold certified low emitting products.

.4 Sealer: to be recommended by the manufacturer. Must be water-resistant sealer or glue with low VOC.

.5 Draw Bolts: mechanical devices of approved manufacture which can be recessed into the core of decorative laminated panels and used to draw two parts together for permanently tight joints.

.6 Fasteners:

.1 Wood screws: electroplated to CSA -B35.4

.2 Nails and staples: to CSA-B111

.7 Plywood

.1 Exterior grade. Thickness to suit.

2.3 COMPONENTS

.1 Stick-built curtain wall:

.1 63.5mm (2.5") Thermally broken, captured, vertically stick-built, double glazed aluminum curtain wall system of tubular aluminum sections with self supported framing:

.1 Structural mullion depth: 73mm (2-7/8")

.2 Curtain Wall Cap depth: standard.

.3 Acceptable products:

.1 Alumicor Limited: ThermaWall TW2600 Series

.2 Oldcastle Building Envelope: Reliance Series High Performing Curtain Wall System

.3 Kawneer Company Inc.: 1600 UT Curtain Wall System.

.4 Windspec Inc.: 5500 HTP Curtain Wall System.

.5 Alwind Industries Ltd.: CDS 2500 Series Curtain Wall (complete with polyamide pressure plates).

.6 Or approved equal. Any alternate system must be proposed during the bid period for review. If not, the Owner reserves the right to enforce a specified system and not accept the proposed alternate at no cost to the Owner.

.2 Swing Doors

.1 Swing doors to be the same manufacturer as the curtain wall system and are to be compatible in all respects.

.2 Medium stile door, thermally broken with mechanically fastened and welded corners and dual weatherstripping and bulb gaskets . Doors to accept 25mm (1") insulating glazing unit infill.

.3 Acceptable Products:

.1 Alumicor Limited: ThermaPorte 7700

.2 Oldcastle Building Envelope: Standard or Rugged Door and Frame

.3 Kawneer Company Inc.: Insulpour Thermal Entrance.

.4 Windspec Inc.: HTP Series Doors.

.5 Alwind Industries Ltd.: Compatible door with curtain wall system.

.6 Or approved equal as compatible with the approved curtain wall system.

2.4 FABRICATION

.1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

.2 Accurately fit and secure joints and corners. Make joints flush, hairline and weatherproof.

.3 Prepare components to receive anchor devices. Install anchors.

.4 Arrange fasteners and attachments to ensure concealment from view.

.5 Reinforce framing members for external imposed loads.

.6 Visible manufacturer's identification labels not permitted.

2.5 ALUMINUM FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.1 Anodized (Clear):

1. Type: Architectural Class I Clear Anodizing
2. AAMA Specification: Comply with AAMA 611
3. Aluminum Association Designation: AA-M10-C21-A41
4. Colour: Clear 215-R1

.2 Anodized (Colour):

1. Type: Architectural Class I Colour Anodizing
2. AAMA Specification: Comply with AAMA 611
3. Aluminum Association Designation: AA-M10-C21-A44
4. Colour: Black, Dark Bronze,

2.6 PLASTIC LAMINATE WORK

.1 All units shall be shop fabricated. Plastic laminate shall be applied to moisture resistant ULEF particleboard core with thermosetting adhesive.

.2 Build work plumb, true and square. Arrange adjacent parts of continuous laminate work to match in colour and pattern.

.3 Obtain the governing dimensions (field measure) before fabricating items, which are to accommodate or abut appliances or equipment. Field measure all sills prior to fabrication.

.4 Veneering of plastic laminate to core materials shall be done according to the laminate manufacturer’s directions. All veneered work shall be backed with a balancing sheet except where exposed in the finished work, then face veneer to be applied to all exposed surfaces.

.5 Where any fabrication is done at the site, laminate and core materials shall be stored in the work area for not less than 48 ours for preconditioning before bonding together.

.6 Form shaped profiles and bends as detailed, using postforming or bending grade according to the manufacturer's recommendations. Core and laminate profiles shall coincide to provide continuous support and bond over the entire surface.

.7 Self Edging:

.1 Straight self edging shall be decorative laminate 1.6mm thick.

.2 Curved self edging shall be postformed material or bending grade.

.3 Chamfer exposed edges of laminate uniformly at approximately 15mm.

.4 Do not mitre the decorative laminate sheet at edges.

.8 Joints:

.1 Accurately fit decorative laminate together to provide tight, flush, butt joints. Joints in cored panels shall be made with 6mm blind splines and draw bolts, one draw bolt for widths up to 150mm, to or more draw bolts at maximum 450mm on centre for widths exceeding 150mm.

.9 Seal the core at joints and exposed edges with sealer.

2.7 ALTERNATE MANUFACTURERS

.1 Non-specified manufacturers/systems will only be considered during the bid period. If the Contractor carries a non-specified manufacturer or system in their price, the Owner reserves the right to enforce a specified manufacturer and/or a specified system at no change to the Contract Value or Time.

3.0 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for aluminum curtain wall installation in accordance with manufacturer's written instructions.

.1 Visually inspect substrate in presence of the Consultant.

.2 Verify dimensions, tolerances, and method of attachment with other work.

.3 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this Section.

.4 Inform the Consultant of unacceptable conditions immediately upon discovery.

.5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from the Consultant.

3.2 INSTALLATION

.1 Install curtain wall system in accordance with the manufacturer's 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.

.1 Maintain dimensional tolerances and align with adjacent work.

.2 Use alignment attachments and shims to permanently fasten elements to building structure.

.3 Clean welded surfaces and apply protective primer to field welds and adjacent surfaces.

.4 Use thermal isolation where components penetrate or disrupt building insulation.

.5 Install sill flashings:

.1 Support extruded sills throughout their lengths.

.2 Mitre and weld corner sections of metal sills, install drip deflectors and joint covers. Locate joint covers at centres of mullions or columns.

.6 Install engineered transition assembly in accordance with manufacturer's instructions and recommendations.

.7 Fill voids between frames and rough openings, and in mullions with foam insulation in accordance with manufacturer's instructions to maintain continuity of thermal barrier.

.8 Install operating sash in accordance with Section 08 80 00- Glazing.

.1 Exterior Glazed, dry/dry method of glazing.

.9 Install glass and infill panels in accordance with Section 08 80 00- Glazing.

.1 Exterior Glazed, dry/dry method of glazing.

3.3 SITE TOLERANCES

.1 Curtain wall framing to be installed within the following erection tolerances:

.1 Vertical position: plus/minus 3mm (1/8")

.2 Horizontal position: plus/minus 3mm (1/8")

.3 Racking on face: maximum 6mm (1/4")

.4 Racking on elevation: nil

.5 Deviation from true plumb over full height of building: 6mm (1/4") maximum.

.6 Deviation from true straightness in plane over full length of each building face: 6mm (1/4") maximum.

.2 Tolerances of relationship of individual components to be as follows:

.1 Member to member: 0.2mm (8 mils) maximum.

.2 Out of plane between faces of two halves of split mullions, 0.8mm (32 mils) maximum.

.3 Joint width, mullion snap-on cap to mullion snap-on cap: 1.5mm (1/16") maximum. Each joint to be uniform width.

.4 Joint width between base and sill panels: 3mm (1/8") maximum, and of uniform width. Do not apply sealants to joints between panels.

.5 Sealant space between curtain wall and adjacent construction: 13mm (1/2") maximum.

.6 Tolerances are non-cumulative.

3.4 FIELD QUALITY CONTROL

.1 Manufacturer's Field Services:

.1 Submit to Consultant a written agreement from the manufacturer to perform the manufacturer's services.

.2 Ensure manufacturer's representative of curtain wall is present before and during critical periods of installation.

.3 Schedule site visits to review Work at stages listed:

.1 After delivery and storage of products, and when preparatory Work on which Work of this Section depends is complete, but before installation begins.

.2 Twice during progress of Work at 40% and 90% complete.

.3 Upon completion of Work, after cleaning is carried out.

.4 Submit manufacturer's written reports to Consultant describing:

.1 The scope of work requested.

.2 Date, time and location.

.3 Procedures performed.

.4 Observed or detected non-compliance or inconsistencies with manufacturer's recommended instructions.

.5 Limitations or disclaimers regarding the procedures performed.

.6 Obtain reports within five (5) business days of review and submit immediately to Consultant.

3.5 ADJUSTING

.1 Adjust operating sash for smooth operation, with proper tension, throughout their full range of motion and to fit tightly when closed and locked.

3.6 PLASTIC LAMINATE SILLS

.1 Install continuous plastic laminate finished window stools and aprons at all new glazing systems (windows and curtain wall), where indicated.

.2 Install a plywood subsill (min. 6mm thick) to suit.

.3 Provide continuous AB/VR adhesive tape (all sides of windows) to transition between the window and the AB/VR at window perimeter.

.4 Isolate decorative laminate panels from direct contact with metal frames.

.5 Seal the full perimeter with silicone sealant. Refer to 07 90 00.

3.7 CLEANING

.1 Progress Cleaning:

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

.2 Remove protective material from prefinished aluminum surfaces.

.3 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.4 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

.5 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.8 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 Repair damage to adjacent materials caused by glazed aluminum curtain wall installation.

END OF SECTION 08 44 13

DIVISION 8 – ENTRANCES, STOREFRONT AND CURTAIN WALLS

Section 08 71 00 – Door Hardware

1.0 GENERAL

1.1 REFERENCES

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)

.2 ANSI/BHMA A156.1, American National Standard for Butts and Hinges.

.1 ANSI/BHMA A156.2, Bored and Preassembled Locks and Latches.

.2 ANSI/BHMA A156.3, Exit Devices.

.3 ANSI/BHMA A156.4, Door Controls - Closers.

.4 ANSI/BHMA A156.5, Cylinders and Input Devices for Locks.

.5 ANSI/BHMA A156.6, Architectural Door Trim.

.6 ANSI/BHMA A156.8, Door Controls - Overhead Stops and Holders.

.7 ANSI/BHMA A156.12, Interconnected Locks and Latches.

.8 ANSI/BHMA A156.13, Mortise Locks and Latches Series 1000.

.9 ANSI/BHMA A156.14, Sliding and Folding Door Hardware.

.10 ANSI/BHMA A156.15, Release Devices - Closer Holder, Electromagnetic and Electromechanical.

.11 ANSI/BHMA A156.16, Auxiliary Hardware.

.12 ANSI/BHMA A156.17, Self-closing Hinges and Pivots.

.13 ANSI/BHMA A156.18, Materials and Finishes.

.1 ANSI/BHMA A156.19, Power Assist and Low Energy Power - Operated Doors.

.2 ANSI/BHMA A156.21, Thresholds.

.14 ANSI/BHMA A156.22, Door Gasketing and Edge Seal Systems.

.15 ANSI/BHMA A156.26, Continuous Hinges.

.16 ANSI/BHMA A156.28, Keying Systems.

.17 ANSI/BHMA A156.31, Electronic Strikes.

.3 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA)

.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).

.2 CSDFMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet.

.2 Include in submitted product literature, copy of manufacturer’s standard product warranty for each hardware item submitted.

.2 Samples:

.1 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.2 After approval samples will be returned for incorporation in the Work.

.3 Hardware List:

.1 Submit contract hardware list.

.2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.5 Closeout Submittals

.1 Provide operation and maintenance data for door closers, locksets, door holders electrified hardware and fire exit hardware for incorporation into manual.

1.3 MAINTENANCE MATERIALS

.1 Provide maintenance materials.

.2 Supply two sets of wrenches for door closers, locksets and fire exit hardware.

1.4 WARRANTY

.1 Provide a written manufacturer’s warranty, dated from Substantial Completion Certificate, for work of this Section for failure due to defective materials as per the following requirements:

.1 Locks and Latches: minimum seven (7) years.

.2 Butts and Hinges: minimum three (3) years.

.3 Exit Devices: minimum ten (10) years.

.4 Door Closers and assemblies: minimum twenty five (25) years.

.5 Door Operators: minimum two (2) years.

.6 Power Supplies: minimum two (2) years.

.7 Architectural Door Trim: minimum five (5) years.

.8 Door Bottoms, Thresholds, Weatherstripping: minimum five (5) years.

.9 Astragals: minimum one (1) year.

.2 Provide a written Contractor's warranty for work of this Section for failure due to defective installation workmanship for two (2) years, dated from submittal completion certificate.

1.5 QUALITY ASSURANCE

.1 Regulatory Requirements:

.1 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.

.2 Only products certified in accordance with ANSI/BHMA standards are acceptable. Items that are equal in design, function and quality will be accepted upon approval of the Owner.

.3 Only recognized contract hardware distributors will be considered for the work of this section. The distributor shall have on staff a qualified Architectural Hardware Consultant recognized by the Door and Hardware Institute or a person with equivalent qualifications to assist installers and direct detailing, processing and delivery of material, and certify installation acceptance.

.4 Upon completion of finish hardware installation, hardware supplier shall inspect work and shall certify in writing that all items and their installation are in accordance with requirements of Contract Documents and are functioning properly.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store, handle and protect materials in accordance with manufacturer's requirements. Keep all products and materials protected from weather exposure.

.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.

2.0 PRODUCTS

2.1 HARDWARE ITEMS

.1 Only door locksets and latches listed on ANSI/BHMA Standards list are acceptable for use on this project.

.2 Use one manufacturer's products only for similar items.

2.2 DOOR HARDWARE

.1 Locks and latches:

.1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, 4000 bored lock, grade 1, designed for function and keyed.

.2 Mortise locks and latches: to ANSI/BHMA A156.13, series 1000 mortise lock, designed for function and keyed.

.3 Lever handles: design as indicated in hardware groups.

.4 Roses: round.

.5 Normal strikes: box type, lip projection not beyond jamb.

.6 Cylinders: key into keying system as directed.

.7 All corresponding cylinders to be removable.

.8 Finished as indicated.

.2 Butts and hinges:

.1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

.2 Interior hinges of steel, unless otherwise indicated.

.3 Continuous hinges shall be heavy duty as indicated, full height, complete with installation aids and fasteners to suit door and frame conditions. Hinge to have access to electrical items without removing hinge.

.4 Quantity, size and width of hinges in accordance with manufacturer’s recommendations and ASNI/BHMA 156.1.

.3 Exit devices:

.1 To ANSI/BHMA A156.3, function, grade and finish as per schedule. Rim type with push pad design.

.4 Door Closers and Accessories:

.1 Door controls (closers): to ANSI/BHMA A156.4, size in accordance with ANSI/BHMA A156.4. Table A1.

.2 Closers of narrow, slim line design complete with backcheck, rack and pinion hydraulic action.

.3 Closers equipped with full cover, complete with secure and concealed mounting screws.

.4 Adapter plates for added reinforcing shall be added to any opening if required to suit field conditions or door design.

.5 Closers shall include all necessary arm brackets, cush arm supports and blade stop spacers to suit door swing, frame reveals or stop conditions.

.6 Closers capable of field adjustments of at least fifteen (15) percent.

.7 Finish.

.5 Door Operators:

.1 Power-operated pedestrian doors: to ANSI/BHMA A156.10.

.2 Complete with all components including operator housing, power operator, electronic control, soft start, switching networks, and all connecting hardware.

.3 Design intent and function of opening. Supplier to include additional components and power supplies required to properly operate all hardware devices, door control devices, remote control devices, complete with any special cables or wirings to connect all parts.

.4 Operator housing shall be complete with finished end caps prepared for mounting to door frame.

.5 Operator housing shall be factory assembled with all necessary components for proper operation and switching. Relays, wiring harness and other components shall be plug-in type.

.6 Operator controls shall include adjustable time delay, safe-swing circuit as well as provision for accessories.

.7 Complete unit shall be mounted with provisions for easy servicing or replacement without removing the door or frame.

.8 All wiring shall be of shielded type with proper number and gauge of conductor wires to install all components as specified.

.9 Installation of operators shall be carried out by manufacturer’s certified and authorized personnel.

.6 Power Supplies:

.1 To ANSI/BHMA 156.19. Refer to the electrical drawings.

.2 Shall be concealed in ceiling space of suitable adjacent area.

.3 Shall interface with all electrical security components and supplied with all relays and devices to operate.

.4 When key switch is used, it will operate as per hardware notes and reset the power supply.

.7 Auxiliary locks and associated products: to ANSI/BHMA A156.5.

.1 Key into keying system.

.8 Auxiliary hardware: to ANSI/BHMA A156.16.

.1 Combination stop and holder, floor mounted: finished to BMHA 626.

.2 Surface bolt lever extension flush bolt: finish to BMHA 626.

.9 Door bottom seal: heavy duty, door seal of extruded aluminum frame and hollow closed cell neoprene weather seal, surface mounted with drip cap closed ends, clear anodized finish.

.10 Thresholds:

.1 To ANSI/BHMA A156.21 extruded aluminum mill finish, serrated surface, with lip and vinyl door seal insert, thermally broken.

.2 Thresholds of aluminum material. Provide 50 mm longer than opening to allow fitting on site.

.3 When mullion is used, increase length of threshold to fit around mullion.

.4 Fasteners of countersink type suitable to properly install to floor/sill conditions. Supply complete with screw anchors.

.11 Weatherstripping:

.1 Head and jamb seal:

.1 Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.

.12 Astragal: overlapping, extruded aluminum frame with vinyl insert, finished to match doors.

2.3 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

.2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.

.3 Exposed fastening devices to match finish of hardware.

.4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.

.5 Use fasteners compatible with material through which they pass.

2.4 KEYING

.1 Doors to be master keyed as directed.

.2 Provide keys in triplicate for every lock in this Contract.

.3 Stamp keying code numbers on keys and cylinders.

.4 Provide construction cores.

.5 Provide all permanent cores and keys to Owner.

2.5 FINISHES

BHMA	CAN MATERIAL	FINISH
626	C26D Brass/Bronze	Satin Chrome
628	C28 Aluminum	Satin Alum, Anodized
630	C32D Stainless Steel	Satin Stainless Steel
652	C26D Steel	Plated Satin Chrome
689	Al All	Painted Aluminum
	Alum Aluminum	Mill Finish
	TMDFF (to match door and frame finish).	

2.6 ABBREVIATIONS

AL	Aluminum Door and Frame
ATMS STMS	Arm/strike To Template with Machine Screws
ASB	Arm Complete with Sex Bolts
BC	Back Check
C to C, C/L	Centerline to Centerline
Cyl	Cylinder (of a lock)
CMK	Construction Master Key
Deg.	Degree (of opening)
DEL	Delayed Action
FBB or BB	Ball bearing hinge

3.0 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.6 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

.7 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

.1 Install door hardware in accordance with manufacturer’s instructions, using special tools and jigs. Fit accurately and apply securely. Ensure that hardware is installed correctly.

.2 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.

.3 No operating hardware shall be installed at a height of more than 1200 above the finished floor (NBC 3.4.6.16).

.4 Installation to be done by a qualified tradesman. Technical assistance provided by door hardware supplier where required.

.5 Closers shall be installed according to manufacturer’s templates and installation instructions. Unless required otherwise, installation shall be on pull side of door. Outswing doors shall be on push side using top jamb or parallel arm installation.

.6 Where closer or arm is installed on door, sex bolts will be used, finished to match other hardware.

.7 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners. Plates drilled to accept through bolts will not be acceptable.

.8 Where door stop contacts door pulls, mount stop to strike bottom of pull.

.9 Install key control cabinet.

.10 Use only manufacturer’s supplied fasteners. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.11 Remove construction cores and locks when directed by Owner; install permanent cores and check operation of locks.

.12 Installation of all Automatic Operator items to be performed by AAADM certified and manufacturer authorized personnel, including connections to hardware products installed by others.

.13 Installation of Access Control items to be performed by manufacturer certified authorized personnel, including connections to hardware products installed by others.

.14 Wiring Diagrams:

.1 Provide any special information, voltage requirements and wiring diagrams to other trades requiring such information.

3.3 EXAMINATION

.1 Visit site prior to start of installation of hardware.

.2 Visit will include examination of openings, site conditions and materials for conditions that prevent proper application of finish hardware.

.3 Report to General Contractor, in writing, defects of work prepared by other trades and other unsatisfactory site conditions. Commencement of installation will imply acceptance pf prepared work by others.

3.4 FIELD QUALITY CONTROL

.1 Hardware contractor to have a qualified AHC representative from the manufacturer/supplier on site at Substantial Completion Inspection and at commissioning of the finished hardware. Cost of the visits to be included in contract.

.2 Provide an inspection report 6 (six) months after Substantial Completion, completed by a qualified Architectural Hardware Consultant, to note any deficiencies. The inspection should include checking each lock against the key schedule to make sure the correct locks and cylinders are on the proper doors.

.3 Fire Rated Door Assemblies On-Site Inspection:

.1 Upon completion of the installation, inspect each fire rated door assembly to confirm proper operation of its closing device, confirming it meets the criteria of NFPA 80.

.2 Provide a written report to the Owner listing each fire rated door assembly for the project including:

.1 Each door number,

.2 An itemized list of hardware set components for each door opening, and

.3 Each door location in the facility.

3.5 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

.4 Where hardware is found defective, repair or replace or correct as desired by inspection reports.

3.6 CLEANING

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

.4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.7 PROTECTION

.1 All hardware shall be protected against damage from paint, plaster or other defacing materials. Whenever possible manufacturers protective covering when applied, shall not be removed until final project cleaning takes place. Material not protected by manufacture shall be covered or removed from door during painting or any other adjustments that can cause damage to hardware.

3.8 DEMONSTRATION

.1 Keying System Setup:

.1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.

.2 Turn over keys to Owner.

.2 Designated Staff Briefing:

.1 Brief designated staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.

.3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.9 COMMISSIONING

.1 Site inspection or visit at Substantial Completion and training follow up and inspection at commissioning as directed by Owner.

END OF SECTION 08 71 00

HARDWARE SCHEDULE

1 Pair Exterior Door, Exterior Main Entrance, within curtain wall system. RHRA LHR

Doors to be compatible with curtain wall system

8	HINGE	BB1199-114 x 101-NRP	630
2	PANIC DEVICE	CD98EO	630
2	MORTISE CYLINDER- CYL DOGGING	20-001 X 1.125X XQ11-949	626
2	CLOSER	4040XP X EDA	689
2	CONCEALED STOP @ 110 DEG OPEN	104 S	630
1	DOOR PULL	120L X 85 X 404	630
1	DOOR PULL – RHR	120L X 85 X 404 X CFC	630
1	PRIMUS RIM CYLINDER	Re-use Existing	
1	FOB READER	Re-use Existing	
1	ELECTRIC STRIKE	Re-use Existing	
1	MULLION	4954 X 7’-2” (From curtain wall manufacturer)	689
1	4954 KEYED MULLION KIT	PT-KR54 MULLION KIT	
1	MORTISE CYL. – MULLION	20-001 X 1.125	626
1	FEMALE RECEPTABLE – WIRE ASSY	105987	
1	MAL RECEPTABLE – WIRE ASSY	105988	
2	KICKPLATE	190S X 152 X 863	630
4	WEATHERSTRIPPING – JAMBS	W50A X 7’-0” (From curtain wall manufacturer)	628
2	WEATHERSTRIPPING HEADER	W20S X 3’-0” (From curtain wall manufacturer)	628
2	SWEEP	W13S X 3’-0”	628
1	THRESHOLDS	CT-45A X 6’-0”	628
2	DOOR CONTACT CONCEALED	#CX-MDH	

NOTE:

1. Security division to do all connections of re-installed card reader/keypad, electric strike and any associated controlled access (timers, etc.) During lock down times.
2. Reinstall all ADO devices and provide new electrical connection.
3. All low voltage items will be paid for under the cash allowance.

1 Single Door #D01 Exit Door . RHR

1 – TBD x TBD x 1-3/4" x PSF x HMD

3	HINGE	BB1199-114 x 101-NRP	630
1	PANIC DEVICE	98TP x 990TP	689
1	PRIMUS RIM CYLINDER	20-021	626
2	CLOSER c/w SPRING STOP	4040XP X SPR CUSH	689
1	DOOR PULL	120L X 85 X 404	630
1	DOOR PULL – RHR	120L X 85 X 404 X CFC	630
1	KICKPLATE	190S X 203 X 863	630
4	WEATHERSTRIPPING – JAMBS	W50s X 7'-0"	628
2	WEATHERSTRIPPING HEADER	W20S X 3'-0"	628
2	SWEEP	W13S X 3'-0"	628
1	THRESHOLDS	CT-45A X 3'-0"	628

DIVISION 08 – OPENINGS

Section 08 80 80 – Glazing

1.0 GENERAL

1.1 REFERENCE STANDARDS

.1 ASTM International

.1 ASTM C542-05-2017, Standard Specification for Lock-Strip Gaskets.

.2 ASTM D790-17, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

.3 ASTM D1003-13, Standard Test Method for Haze and Luminous Transmittance of Plastics.

.4 ASTM D1929-16, Standard Test Method for Determining Ignition Temperature of Plastics.

.5 ASTM D2240-15e1, Standard Test Method for Rubber Property - Durometer Hardness.

.6 ASTM E84-18b, Standard Test Method for Surface Burning Characteristics of Building Materials.

.7 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.8 ASTM F1233-08 (2013), Standard Test Method for Security Glazing Materials and Systems.

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-12.1-2017, Safety Glazing

.2 CAN/CGSB-12.2-M91 (R2017), Flat, Clear Sheet Glass.

.3 CAN/CGSB-12.3-M91 (R2017), Flat, Clear Float Glass.

.4 CAN/CGSB-12.4-M91 (R2017), Heat Absorbing Glass.

.5 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.

.6 CAN/CGSB-12.8-2017, Insulating Glass Units.

.7 CAN/CGSB-12.9-M91, Spandrel Glass.

.8 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.

.9 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.

.10 CAN/CGSB-12.13-M91, Patterned Glass.

.3 Underwriters Laboratories of Canada (ULC)

.1 UL 2761, Sealants and Caulking Compounds.

.4 Glass Association of North America (GANA)

.1 GANA Glazing Manual - 2008.

.2 GANA Laminated Glazing Reference Manual - 2009.

1.2 SUBMITTALS

.1 Product Data:

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

.2 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in the province of Ontario, Canada. Shop drawings are to show glass calculations and confirm that the guard loading is met where applicable.

.3 Samples:

.1 Submit for review and acceptance of each unit.

.2 Submit 305mm (12”) square samples of each glass/glazing type. (Samples of clear monolithic glass products are not required).

.4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.1 For solar control low-e coated glass, provide documentation demonstrating that the fabricator of coated glass is certified by coating manufacturer.

.5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.

.1 Glazing Contractor shall obtain compatibility and adhesion test reports from sealant manufacturer indicating that glazing materials were tested for compatibility and adhesion with glazing sealant as well as other glazing materials including insulating glazing units.

.2 Submit shop testing for glass.

.1 Manufacturer to submit certificate demonstrating that insulating glazing units have been sampled and confirming sufficient argon fill.

1.3 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

.2 Warranty Documentation: Submit Warranty Documents Specified.

1.4 QUALITY ASSURANCE

.1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.

.1 Manufacturer to submit certificate demonstrating that insulating glazing units have been sampled and confirming sufficient argon fill.

.2 Mock-ups:

.1 Construct mock-up to include glazing, and perimeter air barrier and vapour retarder seal.

.2 Mock-up will be used:

.1 To judge quality of work, substrate preparation, operation of equipment and material application.

.2 For testing to determine compliance with performance requirements. Perform tests as follows:

.1 Air leakage and water penetration testing of the glazing assembly as per Section 01 45 24 – Glazing Testing.

.3 Locate where directed.

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

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

.3 Site Glazing Testing:

.1 Site Glazing Testing is to be carried out on 10% of glazing on a random basis.

.2 Site Verify the following properties on site using a Glass Meter

.1 Glass thickness

.2 Dimension of air space

.3 Confirmation of installation and location of Low-E coating.

.3 Surface strain verification for tempered/heat strengthened glazing using a Grazing Angle Surface Polarimeter (GASP) in accordance with ASTM C1048.

1.5 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:

.1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect glazing and frames from nicks, scratches, and blemishes.

.3 Protect prefinished aluminum surfaces with strippable coating.

.4 Replace defective or damaged materials with new.

1.6 AMBIENT CONDITIONS

.1 Ambient Requirements:

.1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.

.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.7 WARRANTY

.1 Provide a written 10-year warranty from date of manufacture for sputter coated glass. Warranty covers deterioration and corrosion of coatings due to normal conditions of use and not to handling, installing and cleaning practices contrary to the glass manufacturer's published instructions.

.2 Provide a written 10-year warranty from date of manufacture for insulating glass. Warranty covers deterioration and hermetic seal failure due to normal conditions of use and not handling, installing, protecting and maintaining practices contrary to the glass manufacturer's published instructions.

2.0 PRODUCTS

2.1 MATERIALS

.1 Design Criteria:

.1 Ensure continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:

.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads to ASTM E330.

.3 Limit glass deflection to 1/200 with full recovery of glazing materials.

.2 Flat Glass:

.1 Float glass: to CAN/CGSB-12.3, Type 1, Class 1 clear and quality Q3

.2 Safety glass: to CAN/CGSB-12.1,

.1 Type 2-tempered.

.1 Class B-float.

.2 Category 11.

.3 Heat soaked.

.4 Edge treatment: Flat Ground

.2 Type 1-laminated

.1 Class B-float

.2 Category 11

.3 Edge treatment: Flat Ground

.3 Spandrel glass: to CAN/CGSB-12.9

.1 Type 1-tempered.

.2 Class A-float.

.3 Style 3-organic coated.

.4 Form M-monolithic.

.5 Acceptable coating products:

.1 Opaci-coat-300 by ICD High Performance Coatings or equal.

.4 Reflective glass: to CAN/CGSB-12.10

.1 Type 2-sealed double glazing unit.

.2 Class C-tempered.

.3 Style 3-low light transmittance.

.4 Grade C-high shading co-efficient.

.5 Level 1-low thermal transmittance.

.5 Patterned glass: to CAN/CGSB-12.3, Obscure Glazing.

.1 Type 1-annealed. (or Type 2-tempered is required to meet guard rail requirements, refer to Glazing Schedule).

.2 Styles: A-figured one surface (Surface #3).

.3 Surface treatment: acid etching.

.4 Edge treatment: Flat Ground

.6 Low emissivity (LOW E) glass, Vertical Fenestration:

.1 Metallic coating: magnetically sputtered vacuum deposition (MSVD), to ASTM C 1376 Standard for Pyrolytic and Vacuum Deposition Coatings on Glass.

.2 Edge Deletion: When low-e coatings are used within an insulating unit, coating shall be edge deleted to completely seal the coating within the unit. The edge deletion should be uniform in appearance (visually straight) and remove 95% of the coating.

.3 Performance requirements:

.1 Vertical Fenestration:

.1 Solar Heat Gain Coefficient: 0.35 maximum

.2 Acceptable Products:

.1 Solarban 70 by PPG

.2 SN62/27 by Guardian Glass

.3 Energy Select 28 by AGC Glass North America

.4 VNE13-63 by Viracon

.5 If noted product is no longer available, an equal or better product from the same manufacturer can be substituted subject to approval.

.3 Insulating Glass Units:

.1 Insulating glass units shall comply with ASTM E 2190 Standard Specification for Insulating Glass Unit Performance Evaluation.

.2 The Unit overall thickness tolerance shall be -1.59mm (1/16”)/0.79mm (1/32”) for a 1” two ply insulating unit. Unit constructed with patterned or laminated glass shall be +/- 1.59mm (1/16”).

.3 Shall comply with ASTM E546 Standard Test Method for Frost Point of Sealed Insulating Glass Units.

.4 Shall comply with ASTM E576 Standard Test Method for Frost Point of Sealed Insulating Glass Units in Vertical Position.

.5 Sealed Insulating Glass Units to be double sealed with a primary seal of polyisobutylene and a secondary seal of silicone.

.1 The minimum thickness of the secondary seal shall be 1.59mm (1/16").

.2 The target width of the primary seal shall be 3.97mm (5/32").

.3 There shall be no voids or skips in the primary seal.

.4 Up to a maximum of 2.38mm (3/32") of the spacer may be visible above the primary polyisobutylene sealant.

.5 Gaps or skips between primary and secondary sealant are permitted to a maximum width of 1.59mm (1/16") by maximum length of 51mm (2") with gaps separated by at least 457mm (18"). Continuous contact between the primary seal and the secondary seal is desired.

.6 To provide a hermetically sealed and dehydrated space, lites shall be separated by a spacer with bent corners and straight butyl injected zinc plated steel straight key joints.

.7 IGU components:

.1 Glass: to CAN/CGSB-12.1.

.2 Glass thickness: 6mm each light.

.3 Inter-cavity space thickness: 13mm with low conductivity black painted stainless steel spacers.

.4 Glass coating: surface number #2 low "E" MSVD.

.5 Inert gas fill: argon.

.6 U-Value (COG): winter 1.42 W/m^2K maximum

.7 Visible Light transmittance:

.1 Vertical Fenestration: 62 minimum

.4 Pre-finished Aluminum Insulating Panels:

.1 25mm (1") Pre-finished Aluminum Insulating Panel to be composed of:

.1 Smooth Aluminum Panel, minimum thickness 0.51mm

.2 3mm impact resistant board (Polypropylene or exterior grade hardboard).

.3 Rigid Insulation: 18mm extruded polystyrene.

.4 3mm impact resistant board (Polypropylene or exterior grade hardboard).

.5 Smooth Aluminum Panel, minimum thickness 0.51mm

.2 Panels to be laminated together under heat and pressure. Edges of panel are to be sealed.

.3 Aluminum panels to be finished to match window or as specified. Acceptable products:

.1 1000 WR+ Water Resistant Infill Panel by Citadel Architectural Products.

.2 Omega Foam-Ply Panel by Omega Panels Products Laminators Inc.

.3 Mapes-R Infill Panel by Mapes Architectural Panels.

.4 Sealant: in accordance with Section 07 90 00- Sealants.

2.2 ACCESSORIES

.1 Setting blocks: Silicone compatible rubber, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square metre of glazing and a minimum 100 mm x width of glazing rabbet space minus 1.5mm x height.

.2 Spacer shims: silicone, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape:

.1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper.

.2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

.4 Glazing splines: resilient silicone, extruded shape to suit glazing channel retaining slot.

3.0 EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.

.1 Verify that openings for glazing are correctly sized and within tolerance.

.2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.

.3 Visually inspect substrate in presence of Consultant.

.4 Inform Consultant of unacceptable conditions immediately upon discovery.

.5 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed Consultant.

3.2 PREPARATION

.1 Remove all foreign matter and debris from glazing frame.

.2 Immediately before glazing, wipe contact surfaces with Isopropyl Alcohol 99% concentration.

.3 Seal porous glazing channels or recesses with substrate compatible primer or sealer.

.4 Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION: EXTERIOR - DRY METHOD (TAPE AND GASKET)

.1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Perform work in accordance with GANA Glazing Manual for glazing installation methods.

.3 Cut glazing tape to length; and set against permanent stops, 3mm below sight line. Seal corners by butting tape and dabbing with sealant at the joint and for 75mm (3”) along each side. Take care to ensure drainage paths are not blocked.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

.6 Install backer rod between glazing and window frame and apply continuous heel bead, the full perimeter of the glass.

.7 Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

3.4 INSTALLATION: EXTERIOR DRY METHOD (GASKET AND GASKET)

.1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Perform work in accordance with GANA Glazing for glazing installation methods.

.3 Seal corner joints of gasket on the fixed glazing stop.

.4 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.

.5 Rest glazing on setting blocks and push against fixed stop gasket with sufficient pressure to attain full contact at perimeter of lite or glass unit. Ensure that pre-installed heel bead gasket is against the face of the interior glazing lite.

.6 Seal heel bead gasket corner joints.

.7 Install removable stops and install glazing spline.

3.5 INSTALLATION: CURTAIN WALL (CAPTURED)

.1 Manufacturer's Instructions: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

.2 Perform work in accordance with GANA Glazing for glazing installation methods.

.3 Seal corner joints of gasket on the curtain wall shoulder.

.4 Install glass support at corner locations and position setting blocks onto glass supports (two per lite). Refer to approved shop drawings or dead load charts. Set glass in opening from exterior. Ensure that the glass bite is equal on all sides or as per approved shop drawing details. Be certain that glass is placed firmly against interior gasket to ensure a proper seal and to avoid binding of the glass on the setting block.

.5 Install glazing temporary glazing clips at each end of the horizontals and at the center of each horizontal if the DLO is greater than 1220mm (4'-0”) in length. Temporary glazing duchies are intended for short-term use only.

.6 Install PVC spacer around the perimeter of the frame prior installing pressure plate. Remove temporary glazing clips on the vertical mullion to install the vertical pressure plate. Pressure plate fasteners must be located 1 1/2" from each end to maintain proper compression. Drill 7/32” diameter holes as required.

.7 Remove temporary glazing clips at the horizontals, center horizontal pressure plate in the opening, leaving a 1/8" gap on each end. Make sure the weep holes are on the top side of the pressure plate.

.8 After all pressure plates are installed on the frame, torque the fasteners to 90 in-lbs. Seal ends of horizontal pressure plates to the vertical pressure plate. Tool sealant into the joint.

.9 Install vertical face covers first, then install the horizontal covers leaving an equal gap at each end. Make sure the weep hole is on the bottom. Face covers are to be installed by using wood block and dead blow soft face hammer to protect the cover.

3.6 CLEANING

.1 Progress Cleaning:

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

.1 Remove traces of primer, caulking.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels.

.4 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.7 PROTECTION

.1 Protect installed products and components from damage during construction.

.2 After installation, mark each light with an "X" by using removable plastic tape or paste.

.1 Do not mark heat absorbing or reflective glass units.

.3 Repair damage to adjacent materials caused by glazing installation.

3.8 SCHEDULE

.1 Glazing Type G1: Insulating Glazing Unit (Standard Window)

.1 Exterior Glass Ply: 6mm clear, tempered.

.2 Low-E sputter coat (surface #2).

.3 Spacer: 13mm black painted stainless steel spacer.

.4 Inert gas fill: Argon

.5 Interior Glass Ply: 6mm clear, annealed, laminated (3+3)

.1 If installed in a door/sidelite or the window sill is below 1070mm above finished floor, the window must resist guard rail loads. Glass thickness and heat treatment must be adjusted as needed.

.2 "P" sub-designation: Translucent Acid Etch on surface #3 (obscure glazing in all washrooms and locker rooms).

.2 Glazing Type SP: Spandrel Glass

.1 6mm clear, tempered.

.2 Organic Coating, surface #2, colour to later selection.

.3 Glazing Type G2: Insulating Glazing Unit (Standard Window) – Alternate Price

.1 Exterior Glass Ply: 6mm clear, tempered.

.2 Low-E sputter coat (surface #2).

.3 Spacer: 13mm black painted stainless steel spacer.

.4 Inert gas fill: Argon

.5 Interior Glass Ply: 6mm clear, tempered, laminated (3+3)

.1 If installed in a door/sidelite or the window sill is below 1070mm above finished floor, the window must resist guard rail loads. Glass thickness and heat treatment must be adjusted as needed.

.4 Glazing Type G3: Insulating Glazing Unit (Standard Window) – Alternate Price

.1 Exterior Glass Ply: 6mm clear, tempered.

.2 Low-E sputter coat (surface #2).

.3 Spacer: 13mm black painted stainless steel spacer.

.4 Inert gas fill: Argon

.5 Interior Glass Ply: 6mm clear, tempered

.1 If installed in a door/sidelite or the window sill is below 1070mm above finished floor, the window must resist guard rail loads. Glass thickness and heat treatment must be adjusted as needed.

END OF SECTION 08 80 00

DIVISION 9 – FINISHES

Section 09 25 00 – Interior Gypsum Board

1. GENERAL

1.1 RELATED SECTIONS

.1 Section 01 03 00 – General Instructions

.2 Section 01 11 13 – Work Covered by the Contract Documents

.3 Section 08 44 10 – Glazed Aluminum Curtain Windows

.4 Section 09 91 23 – Interior Painting

1.2 REFERENCES

.1 ASTM C1280-94 Specification for Application of Gypsum Sheathing Board.

1.3 DELIVERY, STORAGE AND PROTECTION

.1 Deliver materials to the job site in manufacturer's original packaging, containers and bundles with manufacturer's brand name and identification intact and legible. Questionable materials shall not be used.

.2 Store level and handle materials to protect against contact with damp wet surface, exposure to weather, breakage and damage to edges. Provide air circulation under covering and around stacks of materials.

1.4 LIMITATIONS

.1 Do not use sheathing as a base for nailing or mechanical fastening. Fasteners should be flush to the sheathing's face.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Apply wallboard and joint treatment to dry surfaces.

2. PRODUCTS

2.1 GYPSUM WALLBOARD (INTERIOR)

.1 Sheetrock Brand Gypsum Panels, Regular, 12.5 mm (1/2") thick, as manufactured by USG Corporation.

.2 Accessories

.1 Joint tape:

.1 Sheetrock Brand Joint Tape manufactured by USG Corporation. Standard width.

.2 Joint compound:

.1 Sheetrock Brand All-Purpose joint Compound as manufactured by USG Corporation.

.3 Screws, metal framing:

.1 Drywall screws, self-tapping, rust-resistant, fine thread for steel studs.

.4 Corner Bead, Edge Beads, Trim

.1 Sheetrock Brand as manufactured by USG Corporation. Sizing to suit.

.5 Sealant

.1 Paintable acrylic latex; Tremco A834, or approved alternate.

3. EXECUTION

3.1 EXAMINATION

.1 Examine framing; verify that surface of framing to receive wallboard does not vary more than 6 mm (¼") from the place of faces of adjacent members.

3.2 PREPARATION

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

3.3 GENERAL

.1 Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

.2 Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

.3 Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.4 GYPSUM WALLBOARD INSTALLATION

.1 Comply with ASTM C 1280, GA-253 and manufacturer's written instructions.

.1 Fasten sheathing to metal studs with screws.

.2 Install boards with a 9.5 mm (3/8") gap where non-load-bearing construction abuts structural elements.

.3 Install boards with a 6 mm (1/4") gap where they abut masonry or similar materials that might retain moisture, to prevent wicking.

.2 Apply fasteners so heads bear tightly against face of sheathing boards but do not cut into facing.

.3 Install board vertical edges centered over studs. Abut ends and edges of each board with those of adjacent boards. Attach boards at perimeter and within field of board to each stud.

.4 Space fasteners approximately 200 mm o/c and set back a minimum of 9.5 mm (3/8") from edges and ends of boards.

3.5 CORNER AND EDGE BEAD, METAL TRIM

.1 Install all corner and edge bead, and metal trim as per the manufacturer's recommendations.

.2 Embed same fully in joint compound.

.3 Sand as required to achieve a uniform finish to accept interior paint. Readily use vacuums to limit the dust and its spread.

3.6 JOINT TAPING AND SEALING

.1 Install joint tape and compound in accordance with the Manufacturer's recommendations.

.2 Ensure that the joint tape is fully embedded in joint compound and well adhered to the wallboard.

.3 Sand all joints and seams as required to achieve a uniform finish to accept interior paint. Readily use vacuums to limit the dust and its spread.

.4 Ensure the joint tape is centred over joint or seams.

3.7 CLEANING

.1 Following completion of the work, thoroughly clean all interior surfaces, wall, floors, ceilings, etc. of all dust and debris to the satisfaction of the Consultant and the Owner.

END OF SECTION 09 25 00

DIVISION 9 - FINISHES

Section 09 91 13 – Exterior Coatings

1.0 GENERAL

1.1 DESCRIPTION

.1 Work includes both shop and field coated metal. Note that in all applications, the topcoat will be field installed. For all new materials and retained materials removed from site, the system will be shop prepared and the primer and base coat are to be shop applied.

1.2 ENVIRONMENTAL CONDITIONS

.1 Store, handle and install materials in accordance with manufacturer's written recommendations.

1.3 FIELD REVIEW AND TESTING

.1 Notify the Consultant for review of preparation of metal surfaces and application of coating.

.2 Do not commence topcoat application until you receive written authorization from the Consultant.

.3 All coating applications shall be inspected in accordance with SSPC-PA2, Measurement of Dry Film Thickness with Magnetic Gauges, as well as ASTM D 3359, Standard Test Methods for Measuring Adhesion by Tape Test.

.4 Deficiencies shall be repaired in accordance with manufacturer's written instructions.

.5 Inspection and testing of work done to repair deficiencies shall be paid for by the Contractor.

1.4 QUALITY ASSURANCE

.1 Contractor to have a minimum of five years proven satisfactory experience. When requested, provide list of last three comparable jobs including, job name and location, specifying authority, and project manager.

.2 Conform to latest MPI requirements for exterior repainting work including cleaning, preparation and priming.

.3 The contractor shall arrange for the coating manufacturer's representative to inspect the work, perform on-site adhesion testing at the mock-up and at regular intervals during the work. Provide written project recommendations including observations made during shop/site visits and on-site test results in accordance with the project specifications.

.4 Notify Consultant for review of surface preparation prior to coating application, and completed coating application prior to demobilizing from each work area.

2.0 PRODUCTS

2.1 GENERAL

.1 All paint materials, including primers, paints, coatings, thinners and solvents, to be products of a single manufacturer and designated by that manufacturer to be compatible with the existing conditions and to each other.

.2 The coating system is to be applied in three coats, with a multi-pass technique, to the film thickness required for the intended service and condition of the substrate.

.3 All materials to be in accordance with the latest edition of the MPI Approved Product List and be the highest quality product of an approved manufacturer listed in the MPI Maintenance Repainting Manual.

.4 The paint used on this project shall be for exterior application.

.5 All primers and base coats shall be tinted to a colour contrasting with the coats that follow.

.6 All materials delivered to the site must be in the original containers with unbroken seals and intact labels clearly identifying the product.

.7 Use materials in strict accordance with the manufacturer's specifications and requirements.

.8 Colours will be selected by the Owner on site.

2.2 EXISTING COATING SYSTEM REMOVAL

.1 Peel Away 1, Heavy Duty Paint Remover

.2 Super Remover, multi layer stripper

.3 Or approved equal

2.3 COATING SYSTEMS

.1 New copper, lead coated existing copper and existing galvanized steel:

.1 Decontaminate surfaces as per SSPC SP-1 "Solvent Cleaning"

.2 Surface preparation: Brush Blast as per SSPC SP-7, OR, Manual/Power Tool Cleaning as per SSPC SP 2/3.

.3 Primer: Rustbond PS, Epoxy primer/tie-coat applied in one coat at 1 to 3 mils DFT manufactured by Carboline

.4 Mid-Coat: Carboguard 890, Epoxy coating applied in one coat at 4 to 6 mils DFT manufactured by Carboline

.5 Topcoat: Carbothane 134UV Ultra applied in one coat at 2 to 3 mils DFT, manufactured by Carboline colour to be selected by Owner.

.2 New and existing wood surfaces:

.1 Decontaminate surfaces as per SSPC SP-1 "Solvent Cleaning"

.2 Surface preparation: Manually sand surfaces to remove existing coatings, paints and varnishes.

.3 Primer: Sanitile 120, Acrylic primer/tie-coat applied in one coat at 1 to 2 mils DFT manufactured by Carboline

.4 Mid-Coat: Carbocrylic 3359DTM, Acrylic coating applied in one coat at 2 to 3 mils DFT, manufactured by Carboline use a colour different to the topcoat to provide contrast during application.

.5 Topcoat: Carbocrylic 3359DTM, Acrylic coating applied in one coat at 2 to 3 mils DFT, manufactured by Carboline colour to be selected by Owner.

.3 Existing Steel:

.1 Decontaminate surfaces as per SSPC SP-1 "Solvent Cleaning".

.2 Surface preparation: Brush Blast as per SSPC SP-7, OR, Manual/Power Tool Cleaning as per SSPC SP 2/3.

.3 Primer: Rustbond PS, Epoxy primer/tie-coat applied in one coat at 1 to 3 mils DFT manufactured by Carboline.

.4 Mid-Coat: Carbomastic 15, Aluminum Flake Filled Epoxy coating applied in one coat at 5 to 7 mils DFT manufactured by Carboline.

.5 Topcoat: Carbothane 134UV Ultra applied in one coat at 2 to 3 mils DFT, colour to be selected by Owner manufactured by Carboline.

2.4 ACCESSORIES

.1 Wood Filler: PC-Woody Epoxy Paste

3.0 EXECUTION

3.1 QUALITY CONTROL

.1 All work shall meet or exceed the more stringent of the manufacturer's requirements or the requirements of this Specification, or the standards quoted.

.2 Single Source Responsibility: All coating materials shall be those of a single manufacturer. The specified coating materials manufactured by the Carboline Company have been chosen to set a standard of quality as is required to provide the intended performance.

.3 Inspector Qualifications: A NACE Certified Coatings inspector is to verify and report that all the provisions in this specification and the product data sheets are adhered to during the decontamination, surface preparation and installation of the coating system. All inspection records are to be shared with the owner, contractor and the coatings manufacturer.

.4 Coating Application: Compliance to this specification is necessary to ensure that the best available performance is attained from the particular coating system selected. Refer to SSPC PA-1 “Shop, Field and Maintenance Painting of Steel” for generic, industry standard, good painting practices.

.5 All coated steel shall have the dry film thicknesses verified by inspection with either a metallic or non-metallic Positector or similar dry film thickness testing device. Dry film thickness readings to be taken in accordance with SSPC PA-2 – 2012, level 3.

3.2 STORAGE OF MATERIALS

.1 Store materials in a single location designated by the Consultant. Maintain neat and clean. Remove soiled and/or used rags at end of each workday to avoid risk of fire.

3.3 SURFACE PREPARATION – COPPER, LEAD COATED COPPER, STEEL AND GALVANIZED STEEL

.1 All oil, grease and contaminants must be removed prior to surface preparation.

.2 Removal of oil and grease to be done in accordance with SSPC SP-1 “Solvent Cleaning”.

.3 Before surface preparation commences, measure the chloride concentration on the surfaces and verify that it is lower than 15 µg/cm2. Should the chloride concentration on the surface of the steel be above 15 µg/cm2, use a Chlor-Rid wash until the measured levels are below the specified limit.

.4 Surfaces should be brush blasted by dry abrasive blasting in accordance with SSPC-SP7

.5 The anchor pattern or "tooth" on all galvanized steel and copper surfaces to be coated shall be sharp, angular and dense with a minimum depth of 1 mil (25.4 microns), as measured by ASTM D 4417.

.6 All prepared surfaces should be vacuum cleaned to remove all blast media and dust after blasting is completed. Ensure that any vacuum attachment that touches the surface is clean and does not contaminate the surface.

.7 Non-visible oxidation of the surfaces to be coated shall not be permitted between the time of blasting and application of the primer on the blasted surface. Ensure that the primer is applied to the clean surfaces as soon as practical and within the same shift that completed the surface preparation steps.

.8 Care should be taken to avoid contamination of the prepared surface and previous coats by perspiration, fingerprinting, or by the introduction of other contaminants from the workers' clothes or their equipment.

3.4 SURFACE PREPARATION – WOOD

.1 All oil, grease and contaminants must be removed prior to surface preparation.

.2 Removal of oil and grease to be done in accordance with SSPC SP-1 “Solvent Cleaning”.

.3 Surfaces should be sanded using coarse, medium and fine sandpaper.

.4 All prepared surfaces should be vacuum cleaned to remove all blast media and dust after blasting is completed. Ensure that any vacuum attachment that touches the surface is clean and does not contaminate the surface.

.5 Non-visible oxidation of the surfaces to be coated shall not be permitted between the time of blasting and application of the primer on the blasted surface. Ensure that the primer is applied to the clean surfaces as soon as practical and within the same shift that completed the surface preparation steps.

.6 Care should be taken to avoid contamination of the prepared surface and previous coats by perspiration, fingerprinting, or by the introduction of other contaminants from the workers' clothes or their equipment.

3.5 SITE PREPARATION PRIOR TO COATING INSTALLATION

.1 Mask over adjacent surfaces as required, producing neat and true paint lines at discontinuous edges.

.2 Protect adjacent surfaces and surfaces below from dripping, overspray etc.

.3 Install "WET PAINT" signs.

.4 Enclose areas below the work to prevent access to pedestrians. Be responsible for any paint spilled on vehicles or other objects below the work area.

3.6 MATERIAL PREPARATION

.1 Mix well before using.

.2 Withdraw from original container only as much material as can be used in one day. Do not return unused material to original container.

.3 Maintain containers closed if not extracting paint.

.4 For thinning, use only those materials permitted by the Consultant and approved by the manufacturer.

3.7 APPLICATION OF PRIMER COAT

.1 Mix thoroughly to manufacturer's instructions.

.2 Apply primer coat to all metal surfaces that were exposed by surface preparation.

.3 Apply primer to exceed the minimum dry film thickness (DFT).

3.8 APPLICATION OF BASE/FINISH COATS

.1 Apply in strict accordance with manufacturer's requirements. Do not use any other paint application methods unless prior written approval is obtained from the Consultant.

.2 Apply base coat and finish coats to all surfaces to exceed the minimum DFT specified by the manufacturer.

.3 The dried finish coat shall be uniform in appearance, colour, and gloss. The "lap-in" areas shall exhibit uniformity with the adjacent painted areas. The finish shall be free of dirt, coarse particles, or any other foreign matter.

.4 The final finish coat shall completely cover in one application. The Contractor shall touch-up areas which were not properly coated the first time.

END OF SECTION 09 91 13

DIVISION 9 – FINSHES

Section 09 91 23 – Interior Painting

1. GENERAL

1.1 SECTION INCLUDES

.1 All surfaces as identified on the drawings to be painted or varnished, including but not limited to:

.1 2 feet around perimeter of window replacement.

.2 6 feet of interior partition walls that perpendicularly abut new glazing system.

.2 All existing painted surfaces that are altered during the course of the work are to be painted.

.3 All surfaces damaged as a result of the work are to be painted or varnished.

.4 Provide surface preparation to receive painting and finishing specified under this section of the work in accordance with the Canadian Painting Contractors' Architectural (CPCA) Painting Specifications Manual and as specified herein. The most restrictive measure shall apply.

1.2 RELATED SECTIONS

.1 Section 07 90 00 – Sealant

1.3 REFERENCES

.1	ASTM D523	Test Method for Specular Gloss
.2	CAN/CGSB-85.100	Painting
.3	ECP	Environmental Choice Program
.4	CAN/CGSB 1.121	Vinyl Pre-treatment Coating for metals (vinyl Wash Primer)
.5	CGSB 85-GP-33M	Painting Interior Plaster and Wallboard.
.6	ECP-07	Water-borne Surface Coatings
.7	OPCA	Ontario Painting Contractors Association
.8	ULC	Underwriters' Laboratories of Canada

1.4 SUBMITTALS

.1 Two weeks after award of Contract, submit to the Consultant a complete list of paint and finish materials to be used, showing the name of the manufacturer, the catalogue number, grade, and quality of the materials proposed for use.

.2 Two (2) weeks prior to the commencement of work, submit two (2) samples of each proposed paint demonstrating both finish and colour on a substrate matching the substrates encountered on site. Samples to be 4x12 inches in size. Resubmit samples until colours have been approved by the Consultant.

1.5 QUALIFICATIONS

.1 The installer shall be a company specializing in painting work with a minimum of ten (10) years proven experience for projects of similar size and complexity.

.2 Use single painting Contractor for all work.

1.6 DELIVERY, STORAGE AND PROTECTION

.1 Store materials in a cool dry place so as not to be in contact with earth and to be protected from elements.

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

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

.4 Remove rejected or contaminated materials from the site.

1.7 WARRANTY

.1 The Contractor is to warrant work of this Section against defects and deficiencies for a period of two (2) years from the date the Work is certified as substantially performed in accordance with the General Conditions of the Contract and as amended by the Supplementary General Conditions.

1.8 ENVIRONMENTAL REQUIREMENTS

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

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

.3 Atmosphere at the area of work shall be dust free.

.4 Temperatures, humidity, and moisture content of surfaces shall conform to the following:

.1 Temperatures: No painting shall be performed when temperatures on the surface, or the air in the vicinity of painting work are below 5°C. The minimum temperatures allowed for latex paints shall be 7°C. for interior work and 10°C for exterior work, unless specifically approved by the Consultant.

.2 Relative humidity shall not be higher than 85%.

.5 Painting work shall not proceed unless a minimum of 15 candle power/sq ft lighting is provided on the surface to be painted.

.6 All areas where painting work is proceeding shall have adequate continuous ventilation and sufficient heating to maintain temperatures above 7°C. for 24 hours before and after paint application.

.7 Take all necessary precautions to prevent fire hazard and spontaneous combustion.

.8 Where toxic materials, and both toxic and explosive solvents are used, take appropriate precautions

2. PRODUCTS

2.1 MATERIALS

.1 Paint, varnish, stain, enamel, lacquer, fillers and other finishing materials shall comply with or exceed CAN2-85.100 for Premium Grade Work, highest grade, top line quality products of the specified manufacturers, and be of a type and brand herein specified and listed under "Paint Product Recommendations" as covered in the CPCA Painting Manual, for the specific purposes.

.2 Paint materials such as linseed oil, shellac, turpentine, etc., and any of the above materials not specifically mentioned herein but required for first class work shall be the highest quality of an approved manufacturer. All coating materials shall be compatible.

.3 The approval of the manufacturer of the painting and finishing materials will be based on this agreement to provide the supervision service herein before specified.

.4 The following manufacturers are acceptable:

.1 Benjamin Moore Paints

.2 ICI Paints (Canada) Inc. (The Glidden Company/CIL)

.3 Pratt and Lambert Inc

.4 PPG Canada Inc.

.5 Sherwin-Williams Company of Canada Limited

.6 Sico Inc.

.7 Para Paints

.5 The Consultant reserves the right to refuse any paint or finishing material if in their opinion it is not suitable or adequate for the use which it is proposed.

.6 Interior Galvanized Metal Primer: Glid-Guard All-Purpose Metal Primer 5229 by Glidden Co. Canada Ltd., Alkyd/Calcium plumbate, #52 Galvaprime by Para Paints Limited, Galvanized Metal Primer #150-00 by Benjamin Moore and Company Ltd., or other approved manufacture.

.7 Vinyl Wash Primer: Complying with CAN/CGSB 1.121.

.8 A minimum of 2 coats plus a primer is expected in all areas. Additional coats may be required to blend in the colour to the adjacent wall.

2.2 MIXING

.1 Paints shall be ready-mixed unless otherwise specified, except that any coating in paste or powder form, or to be field-catalyzed shall be field-mixed in accordance with directions of its manufacturer. Pigments shall be fully ground and shall maintain a soft paste consistency in the vehicle during storage that can and shall be dispersed readily and uniformly by paddle to a complete homogeneous mixture.

.2 Paint shall have good flowing and brushing properties and shall dry cure free of sags and runs etc. to yield the desired finish specified.

2.3 COLOURS

.1 Colour: Standard colour as directed by the Owner to match the existing wall colour.

.2 For bidding purposes, colour scheme shall include 4 colours.

.3 All bidders shall include in their bid price cutting-in for four (4) colours on walls.

3. EXECUTION

3.1 PROTECTION

.1 Adequately protect other surfaces from paint and damage and make good any damage caused by failure to provide suitable protection.

.2 Furnish sufficient drop cloths, shields, and protective equipment to prevent spray or dropping from fouling surfaces not being painted and, surfaces within storage and preparation area.

.3 Cotton waste, cloths and material which may constitute a fire hazard shall be placed in closed metal containers and removed daily from the site.

.4 Remove all electrical plates, surface hardware, fittings, and fastenings, prior to painting operations. Carefully store, clean, and replace these items on completion of work in each area. Do not use solvent that will remove the permanent lacquer to clean hardware.

3.2 EXISTING CONDITIONS

.1 Examine the work upon which the work of this Section depends prior to commencement of work. If surfaces cannot be put in proper condition by customary cleaning, sanding and puttying, report any defects to the Consultant.

.2 Failure to report defects will constitute acceptance of surfaces. Refinish the faulty work at no expense to the Owner.

.3 Test all surfaces by an approved moisture-testing device for moisture content before commencing work. Do not apply paint to substrates when the moisture content exceeds 12%.

3.3 PREPARATION - GENERAL

.1 Remove all old overpaint as well as new.

.2 Remove all foreign matter such as oil, grease, was, rust, stains, scale, efflorescence, mildew, mould, algae, and fungus from surfaces to be repainted and/or re-varnished.

.3 Remove all non-adhering and peeling paint and varnish to stable sub-surface and/or bare substrate.

.4 Remove thick and sharp edges of paint and varnish build ups, spiky and rough areas by sanding prior to painting. Provide a smooth and properly prepared substrate acceptable for painting. Dust off with a clean damp cloth to remove all residue prior to painting and allow to dry.

.5 Feather down surfaces visible to view prior to painting.

.6 Dull hard glossy surfaces by light sanding.

.7 Follow removal of all non-adhering and peeling paint, including surface imperfections, all surfaces shall be thoroughly washed with T.S.P. and rinsed with fresh clean water. Remove all surface residue prior to painting. Allow to dry.

.8 All cracks, holes, varying levels of paint and varnish, and other imperfections shall be filled. Use spackling compound and/or appropriate material and sand flush with adjacent surfaces, to provide a smooth and properly prepared substrate. Cracks, holes etc. up to 1/4" (6 mm.) deep and 1.0" (25 mm.) wide, shall be the responsibility of the Contractor. Thoroughly Dust-Off prior to painting.

.9 All protruding metals such as nails, tacks, pins, wires, bars, ties, etc. shall be cut flush with substrate. Plugs shall be removed and/or cut to below finish surface then filled and repaired.

.10 Leave in place screw heads intended for wall hung items.

3.4 SURFACE PREPARATION

.1 Refer to Chapter 7 -Surface Preparation and; Section 7.2 - Previously Painted Substrates of the National Standard of Canada CAN2-85.100-M81, for full extent of surface preparations and procedures and as herein specified. In the event of conflict between the Contract Documents and referenced documents, the most stringent provision shall apply:

.1 Mildew Removal: Scrub with solution of T.S.P., and bleach, rinse with water and allow surface to dry completely.

.2 Aluminum (excluding anodized aluminum): Remove surface contamination by steam, high-pressure water or xylene solvent washing. Apply touch-up etching primer (or acid etching), and then paint immediately, as per Manufacturer's instructions.

.3 Asbestos Cement (board, siding, piping, shingles, etc.): Remove dirt, powdery residue and other foreign matter.

.4 Canvas & Cotton Insulated Coverings: Remove dust, dirt, grease and oil, test for water moisture content of 12% or less prior to painting.

.5 Gypsum Board: Remove non-adhering and peeling paint and contamination, prime all areas/surfaces where required, to show defects prior to painting.

.6 Plaster: Remove non-adhering and peeling paint, dirt, powdery residue and other foreign matter. Bare plaster substrate where exposed shall be sealed with masonry conditioner. Application of conditioner shall also be applied beyond the area of bare substrate and over existing painted surface to a minimum of twelve (12”) inches, prior to painting.

.7 Wood for Paint Finish; Remove non-adhering and peeling paint and/or varnish and all foreign matter, prior to spot priming. Fill all nail holes, splits and scratches with suitable wood paste filler before proceeding, sand and thoroughly dust off. Sharp or chipped edges to be feathered down. All surfaces shall be clean and dry with a moisture content reading of not more

than 12%. Surfaces that have been defaced with marker pens that cannot be removed shall be additionally spot-primed to prevent residual bleeding prior to painting

.8 Wood for Varnish Finish; Remove non-adhering and peeling varnish and all foreign matter, prior to spot priming. Fill all nail holes, splits and scratches with suitable wood paste tinted filler before proceeding, sand and thoroughly dust off and wipe with rags dampened with mineral spirits. Lightly sand between coats. Sharp or chipped edges to be feathered down. Surfaces that have been defaced with marker pens that cannot be removed shall be brought to the attention of the Consultant. All surfaces shall be clean and dry with a moisture content reading of not more than 12% prior to painting

.9 Ferrous Metal; Remove rust, grease and scale, and wash with solvent. All ferrous surfaces to be primed before painting. Apply rust inhibitor/primer where necessary prior to painting

.10 Zinc Coated Metal; Remove surface contaminants and wash with solvent. Prepare surface to manufacturers instructions for priming prior to painting.

.11 Masonry and Concrete (brick, concrete, concrete block, stucco, cement render, etc.); Remove dirt, loose mortar, scale, powder and other foreign matter prior to spot priming. Oil and grease to be removed by solution containing T.S.P., then rinse and let dry. Fill minor cracks, holes and fissures with cement grout and smooth to a flush surface. Include bonding agent in cement grout mix. Surfaces that have been defaced with marker pens that cannot be removed shall be additionally spot-primed to prevent residual bleeding prior to painting

.12 Alkaline Surfaces: Wash and neutralize using proper type of solution compatible with paint to be used.

3.5 APPLICATION OF COATINGS

.1 All paint and varnish finish coats shall be applied to a film thickness of four (4) mils wet per coat and two (2) mils dry per coat

.2 All primer coats shall be applied to a film thickness of to achieve a dry mil thickness of one and a half (1 1/2) per coat

.3 Applied and cured coatings shall be uniform in thickness, sheen, colour and texture, and be free of defects detrimental to appearance and performance. Such defects include brush marks, streaks, runs, laps, heavy stippling, pile up of paints and skipped or missed areas. Edges of paint adjoining other materials shall be clean and sharp with no overlapping.

.4 Apply paint and finish materials with suitable equipment.

.5 Apply paint by brush or roller, except on wood or metal surfaces apply paint by brush only

.6 Use rollers which will produce the least possible stipple effect; maximum ten (10) pile for smooth surfaces. Heavier pile rollers may be permitted for use on rough surfaces, subject to the approval of the Consultant

.7 Tint filler to match wood when clear finishes are required. Work filler into the grain and wipe before setting

.8 Use same brand of paint for primer, intermediate and finish coats.

.9 Each coat of finish shall be dry before succeeding coats are applied with a minimum of 24 hours between coats.

3.6 APPLICATION – FINISH COATS

.1 Sand thick sharp edges, spiky and rough areas of paint when dry and touch-up as necessary.

.2 Finish tops, bottoms, edges and rear of doors in the same manner as the front of the door.

.3 When the primer-sealer coat is dry, touch up all visible suction spots before the next coat is applied and do not proceed with the work until all suction spots are sealed.

.4 Finish the work uniformly as to sheen, gloss, colour and texture.

.5 Paint surfaces and items visible through convector covers, grilles, heating cabinets, louvers and soffits with two coats black matte paint.

.6 Do not paint over UL labels on doors and frames or over identification labels on mechanical and electrical equipment.

.7 The following generally, will be painted in colour, texture and sheen to match adjacent surfaces:

.1 Columns

.2 Access Panels

.3 Registers

.4 Radiators and covers

.5 Prime coated butts

.6 Prime painted door closers

.7 Exposed Piping

.8 Paint reveals the same colour as the surface in which it occurs, unless otherwise indicated.

.9 Gloss terms shall have the following values when tested in accordance with ASTM D523 "Test for Specular Gloss":

Gloss Term	Gloss Value	Pittsburgh
Flat (F)	5 to 20	Less than 15
Eggshell (E)	20 to 40	5 to 20
Lo-Lustre (LL)		15 to 25
Satin (S)		15 to 35
Semi-Gloss (SG)	40 to 60	30 to 65

Gloss/medium (Gm)	60 to 80	Over 65
Gloss/high (Gh)	80 to 90	

.10 Finish walls in semi gloss, ceilings in flat and doors and frames in gloss (high), unless noted otherwise.

.11 Spray paint only with the approval of the Consultant, except exposed u/s of roofs and roof support assembly shall be finished using 'Dry Fog' method of application.

3.7 CLEANING

.1 Promptly as the work proceeds and on completion of the work, remove all paint where spilled. Splashed or spattered. During progress of the work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris. At conclusion of the work leave premises neat and clean.

3.8 INTERIOR FINISHES

.1 Unless otherwise identified elsewhere, finish the various interior surfaces as follows, in addition to previously specified treatments, coatings or primers:

Painted Concrete Block/Steel Columns:	Masonry block filler c/w spot priming 1 coat primer 2 coats alkyd enamel (SG)
Painted Mist. Steel & Steel Doors/Frames:	1 coat primer 2 coats alkyd enamel (Gh)
Painted Misc. Wood:	1 coat primer 2 coats alkyd enamel (Gh)
Misc. Structural Steel (Girders, O.W.S.J., Beams, Bracing, Steel Roof Deck, etc.):	2 coats 'Dry Fog' Paint (SG)
Painted Mechanical Equipment:	2 coats alkyd enamel (SG)
Painted Pipes Insulation & Ducts:	2 coats alkyd enamel (SG)
Varnished Wood to Alkyd Paint Finish:	Wood filler 1 coat Benjamin Moore's 'Fresh Start', or equal 2 coats alkyd enamel (Gh)
Clear Finished Wood:	Tinted wood filler 1 coat sanding sealer/shellac 2 coats stained alkyd varnish (Gh)
Plaster, Gypsum Board and Misc. Board:	Repair with Plaster and/or Spackling Compound 1 coat Latex Primer Sealer

	2 coats Latex Finish Coat (S or to match existing)

END OF SECTION 09 91 23

DIVISION 12 – FURNISHINGS

Section 12 24 00 – WINDOW COVERINGS

1.0 GENERAL

1.1 Section Includes:

.1 Manual, chain operated, full height horizontal window roller shades.

1.2 Reference Standards:

.1 NFPA 701 – Standard Methods of Fire Tests for Flame Propagation of Textiles and Films.

.2 CAN/ULC S109-M87: Standard for Flame Tests of Flame-Resistant Fabrics and Films.

1.3 Submittals:

.1 Product Data: Provide manufacturer's data sheets describing components, accessories, dimensions, tolerances for window openings required, colours and textures.

.2 Submit test results from recognized independent testing agency, acceptable to jurisdictional authorities showing that fire hazard classification of shade fabric meets regulatory requirements.

.3 Shop Drawings: Indicate dimensions in relation to window jambs, operator details, top rail, anchorage details, joint locations, method of joining, hardware and accessory details, conditions between adjacent blinds, corner conditions, required clearances, and electrical operating mechanisms and connections.

.4 Samples:

.1 Submit two (2) sets of 300 mm long samples of each visible-to-view component, indicating colour, surface texture and sheen.

.2 Submit duplicate, minimum 200 x 200 mm samples of each shade fabric required.

.3 Submit duplicate, minimum 50 x 100 mm samples of each metal finish / colour required.

1.4 Close-out submittals:

.1 Provide operating and maintenance instructions for inclusion into maintenance manual. Include instructions on care, maintenance and cleaning of shade fabrics.

1.5 Quality Assurance:

.1 Provide shade systems specified by one manufacturer who takes full responsibility for design, engineering and installation.

.2 Pass NFPA 70 and CAN/ULC S109-M87.

1.6 Delivery, Storage and Handling:

.1 All materials shall be free of damage when delivered to the site. Protect all work with suitable heavy wrapping before delivery to the site. Maintain protection until final clean-up.

.2 Store parts in a designated area to permit natural ventilation over their finished surfaces.

.3 Protect the work of this Section from damage resulting from the work of other Sections.

1.7 Warranty:

.1 Provide a two (2) year warranty of the work of this Section and Ten (10) year manufacturer's warranty.

.2 Promptly correct, at no expense to the owner, any defects, or deficiencies which become apparent within the Warranty Period from date of Substantial Performance.

.3 Warranty shall provide for steadfastness of dye colours, fade-proof fabric, free from deterioration in any fashion due to exposure to sunlight, to be permanently flame-retardent, shrink, and complete replacement cost including removal of existing system material and installation of new materials.

2.0 PRODUCTS

2.1 Manufacturers:

.1 Acceptable Manufacturers offering functionally and aesthetically equivalent products:

.1 Solarfective Line: Chain-operated, manual Teleshades (with Fascia).

.2 SunProject of Canada Inc.: Moduline GC Shade System (with Fascia).

.2 Substitutions not permitted.

2.2 Components:

.1 Horizontal Shade Band:

.1 Assembly: Fabric, external bottom bar, attachment of shade bands to roller tube.

.2 Shade Fabric:

.1 Fabric: Pass NFPA 701 and CAN/ULC-S109-M87.

.2 Shade cloths woven of .018 vinyl coated polyester yarn consisting of single thickness non-raveling 0.03inch thick vinyl fabric, comprising 20-25% polyester and 75-80% reinforced vinyl (PVC), the fabric to be dimensionally stable.

.1 Blackout:

.1 For use in rooms for A/V Presentations, theatre, etc.

.2 SolarStop Room Darkening Shadecloth by Solarfective.

.3 Series B.O. 100 Blackout Fabric by SunProject of Canada Inc.

.2 Sun control fabric with 3% Openness Factor:

.1 For use on windows facing West and South exposure.

.2 Shadecloth by Solarfective; 3% SolarBlock 300 Series, colour: 304 Grey/Beige or 302 White/Beige or 308 Grey/White; colours selected by Consultant.

.3 Shadecloth 4400 Series by SunProject Shadecloth, colour: Q15 Greystone or P07 Alabaster or P10 Granite, colour selected by Consultant.

.3 Sun control fabric with 5% Openness Factor:

.1 For use on windows facing North and East exposure.

.2 Shadecloth by Solarfective; 5% SolarShield 500 Series, colours: 504 Grey/Beige or 502 White/Beige or 508 Grey/White; colours selected by Consultant.

.3 Shadecloth 4000 Series by SunProject Shadecloth, colour: Q15 Greystone or P07 Alabaster or P10 Granite, colour selected by Consultant.

.3 Shade Orientation: Shade cloth to roll at window side of roller.

.2 Shade Roller Tube: Extruded aluminum, 32 mm or 50 mm diameter, with reinforced internal ribs to provide maximum span without tube deflection. Tubes to suit shade size.

.3 Exterior Oval Hem Bar: 19 mm tubular extruded aluminum, with recess to secure fabric, without visible seams. Secure end plugs securely on ends showing no exposed aluminum. Design for shade to be pulled from hem bar.

.4 Internal Tension Idler: Adjustable, to automatically control the amount of torque generated for constant smooth operation of the shade system, with automatic release during down-travel, and automatic engage during up-travel.

.5 Chain Drive: Heavy duty, commercial grade sprocket, a planetary gear assembly for increased performance, speed ratio, smoothness, and balance to the chain and shade assembly. Provide infinite positioning of shade system.

.1 Operating Chain: No.10, heavy duty stainless steel bead chain, 40 kg load test.

.2 Chain Hold Down:

.1 To fully secure shade to chain holder.

.2 Supply chain retainer with bracket in every room to meet safety needs.

.3 Lifting mechanism to contain a memory lock to maintain pre-tensioning when the shade is removed from the cassette bracket, and not require re-tensioning when shade is re-inserted into the bracket. Roller to be reversible.

.6 Mounting Brackets: 0.60 mm galvanized steel, snap on brackets for ceiling, wall, or recessed mount in ceiling.

.7 Closure Box: One-piece extruded aluminum box, closed on all four sides, top, back, sides, and bottom return.

.1 Closure Section: Square profile.

.2 Internal groove to accommodate a self cleaning brush.

.3 Gap brush on top back side of cassette to provide for a light seal.

.4 Wall Thickness: 1.52 mm.

.5 Closure End Caps: 2 mm. Delrin plastic with four countersunk flat headed screw holes.

.8 Noise-Reduction seals: insert for sound isolation and absorption of the mechanism.

2.3 Fabrication:

.1 Provide manual shade chain drive window shade, of:

.1 Tension activated lifting mechanism with multi-layer concentric constant tension.

.2 Lifting mechanism with a memory tension lock.

.3 Shade to not require re-tensioning after removal for cleaning.

.4 Internally free-floating mechanism along grooved non-corrosive shaft, and reversible for future alterations and maintenance.

.2 Factory assemble in a one piece container, closed on all four sides, with top, back, sides and bottom return of plastic injected-molded end caps.

.3 Lifting mechanism to accommodate tension modules for maximum shade performance. Provide memory lock for tension modules to retain torque.

.4 Mounting detail: Face/wall mounted recessed above ceiling snap in mount.

3.0 EXECUTION

3.1 Examination:

.1 Examine substrate and conditions for installation.

.2 Examine width of windows to match length of roller shade.

.3 Examine overall height of curtain wall to match fabric length of roller shade.

.4 Beginning of Installation means acceptance of substrate and project conditions.

3.2 Installation:

.1 Install units and their accessories to manufacturer's written instructions.

.2 Securely screw end plugs to conceal exposed cut aluminum of exterior hem bar.

.3 Securely anchor units plumb and level, using hardware and accessories to provide smooth operation without binding, securely anchored to supporting work.

.4 Make all systems fully operational.

3.3 Installation Tolerances:

.1 Maximum variation of gap at window opening perimeter: 6 mm per 2.4 m (plus or minus 3 mm) of shade height.

.2 Maximum offset from level: 3mm over 2.4m.

.3 Use manufacturer's edge clearance requirements for shades where the width-to-height ratio exceeds 1:3.

3.4 Adjusting:

.1 Adjust units for smooth operation.

.2 Adjust shade and shade cloth to hang flat without waves, folds, or distortion.

.3 Replace any units or components which do not hang properly or operate smoothly.

.4 Check test operation of each unit and, if necessary make adjustments to ensure proper operation.

3.5 Cleaning:

.1 Touch up damaged finishes and repair minor damage in a manner to eliminate evidence of repair. Remove and replace work that cannot be satisfactorily repaired.

.2 Clean exposed surfaces and edges/ends, including metal and shadecloth, using non-abrasive materials and methods recommended by manufacturer. Remove and replace work which cannot be satisfactorily cleaned.

3.6 Closeout Activities:

.1 Demonstration: Demonstrate operation method and instruct Owner's personnel in the proper operation and maintenance of the window shade assembly.

3.7 Schedules:

.1 The existing rollarshades are to be remove and reinstated. New rollarshades are required only if the existing is found in a deteriorated state. Any damage of the blinds as a result of the Contractor’s work will be at no cost to the Owner.

END OF SECTION 12 24 00