

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 21 20 - Low Expanding Foam Sealant.
- .2 Section 07 92 00 - Joint Sealants.
- .3 Section 08 71 00 - Door Hardware.
- .4 Section 08 80 50 - Glazing.
- .5 Section 09 91 13 – Exterior Painting
- .6 Section 09 91 23 – Interior Painting.

1.2 REFERENCES

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A653/A653M-15E1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B29-14, Standard Specification for Refined Lead.
 - .3 ASTM B749-14, Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door Manufacturers' Association (CSDMA)
 - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.
 - .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.
- .5 National Fire Protection Association (NFPA)
 - .1 NFPA (FIRE) 80-16, Standard for Fire Doors and Other Opening Protectives.
 - .2 NFPA (FIRE) 252-12, Fire Tests of Door Assemblies.
- .6 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-16, Architectural Coatings.
 - .2 SCAQMD Rule 1168-05, Adhesives and Sealants Applications.
- .7 Underwriters' Laboratories of Canada (ULC)
 - .1 CAN/ULC-S701-11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.

- .2 CAN/ULC-S702-14, Standard for Thermal Insulation, Mineral Fibre, for Buildings.
- .3 CAN/ULC-S704-14, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .4 CAN4-S104-10, Standard Method for Fire Tests of Door Assemblies.
- .5 CAN4-S105-09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
 - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
 - .3 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 for ratings specified or indicated.
 - .4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, NFPA 252 and listed by nationally recognized agency having factory inspection services.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal.
- .2 Provide product data: in accordance with Section 01 33 00 - Submittal.
- .3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal.
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
 - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, arrangement of hardware and finishes.
 - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing finishes.
 - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.

1.5 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.

Part 2 Products

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, 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 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 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMER

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

2.5 PAINT

- .1 Field paint steel doors and frames in accordance with Section 09 91 13 – Exterior Painting or Section 09 91 23 – Interior Painting. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes.

2.6 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior 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 Sealant: Section 07 92 00 – Joint Sealants.
- .7 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. Refer to Section 07 21 20 – Low Expanding Foam Sealant.
- .8 Glazing: Section 08 80 50 – Glazing.
- .9 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable stainless steel glazing beads for dry glazing of snap-on type.
 - .2 Design exterior glazing stops to be tamperproof.
- .10 Finish Painting: to Section 09 91 13 – Exterior Painting or Section 09 91 23 – Interior Painting.

2.7 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: 1.6 mm welded thermally broken type construction.
- .4 Interior frames: 1.2 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised 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.

2.8 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.

2.9 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.

2.10 DOOR FABRICATION GENERAL

- .1 DOORS: HONEYCOMB CORE CONSTRUCTION
 - .1 Form face sheets for exterior doors from 1.6 mm sheet steel with polyurethane core laminated under pressure to face sheets.
 - .2 Form face sheets for interior doors from 1.2 mm sheet steel with honeycomb temperature rise rated core laminated under pressure to face sheets.
- .2 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 polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
 - .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
 - .4 Apply insulation.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 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.

3.3 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 Caulk perimeter of frames between frame and adjacent material.
- .6 Maintain continuity of air barrier and vapour retarder.

3.4 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 and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latchside and head: 1.5 mm.
 - .3 Finished floor: 13 mm.
- .3 Adjust operable parts for correct function.

3.5 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.

3.6 GLAZING

- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.

3.7 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 Department Representative and Certificate will be signed by Contractor and Department Representative.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 21 20 – Low Expanding Foam Sealant.
- .2 Section 07 92 00 - Joints Sealants.
- .3 Section 08 71 00 - Door Hardware.
- .4 Division 26 – Wiring and conduit for electronic hardware.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 Canadian General Standards Board (CGSB)
 - .1 CGSB 1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .3 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .3 CSA International
 - .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CAN/CSA G164-M92(R2003), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1168-A2017, Adhesives and Sealants Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for doors and frames and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Shop Drawings:
 - .1 Indicate materials and profiles and provide full-size, scaled details of components for each type of door and frame. Indicate:
 - .1 Interior trim and exterior junctions with adjacent construction.
 - .2 Junctions between combination units.
 - .3 Elevations of units.
 - .4 Core thicknesses of components.

- .5 Type and location of exposed finishes, method of anchorage, number of anchors, supports, reinforcement, and accessories.
- .6 Location of caulking.
- .7 Each type of door system including location.
- .8 Arrangement of reinforcing for hardware and joints.
- .9 Arrangement of hardware and required clearances.

1.4 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual.

1.5 QUALITY ASSURANCE

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

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with with manufacturer's written instructions.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
 - .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Use coatings that are easy to remove and residue free.
 - .2 Leave protective covering in place until final cleaning of building.
- .3 Storage and Handling Requirements:
 - .1 Store materials off ground, indoors, in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect aluminum doors and frames from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

1.7 WARRANTY

- .1 Provide a written warranty for work of this section from manufacturer for failure due to defective materials and from contractor for failure due to defective workmanship for ten (10) years respectively.

Part 2 Products

2.1 DESIGN CRITERIA

- .1 Design frames and doors in exterior walls to:
 - .1 Accommodate expansion and contraction within service temperature range of -35 to 35 degrees C.
 - .2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind load of 1.2 kPa, submit certificate of tests performed.

- .3 Movement within system.
- .4 Movement between system and perimeter framing components or substrate.
- .2 Size glass thickness and glass unit dimensions to limits in accordance with CAN/CGSB-12.20.
- .3 Design door system to provide average thermal resistance of:
 - .1 Door system: RSI of 1.82.
 - .2 Vision glass areas: RSI of 2.43.
- .4 Include continuous air barrier and vapour retarder through door system. Primarily in line with inside pane of glass and heel bead of glazing compound.

2.2 MATERIALS

- .1 Aluminum extrusions: to Aluminum Association alloy AA6063-T5 anodizing quality.
- .2 Steel reinforcement: to CSA G40.20/G40.21, grade 300 W.
- .3 Fasteners: stainless steel, finished to match adjacent material.
- .4 Weatherstrip: replaceable mohair backed wool pile.
- .5 Door bumpers: black neoprene.
- .6 Door bottom seal: adjustable door seal of anodized extruded aluminum frame and vinyl weather seal, surface mounted with drip cap, closed ends.
- .7 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. Refer to Section 07 21 20 – Low Expanding Foam Sealant.
- .8 Isolation coating: alkali resistant, epoxy resin solution.
- .9 Glass: tempered glass to CAN/CGSB-12.1, 6mm Type 2, Class B.
- .10 Glazing materials: Section 08 80 50 – Glazing.
- .11 Sealants: colour selected by Departmental Representative in accordance with Section 07 92 00 - Joint Sealants.
 - .1 Maximum VOC limit: to SCAQMD Rule 1168.

2.3 ALUMINUM DOORS

- .1 Construct doors of porthole extrusions with minimum wall thickness of 3 mm.
- .2 Door stiles: widths as indicated on drawings.
- .3 Top rail: widths as indicated on drawings.
- .4 Bottom rail: widths as indicated on drawings.
- .5 Centre rail: widths as indicated on drawings.
- .6 Reinforce mechanically-joined corners of doors to produce sturdy door unit.
- .7 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.

- .8 Provide thermally broken doors for exterior.
- .9 Hardware: as per Section 08 71 00 – Door Hardware.

2.4 ALUMINUM FRAMES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Clear anodic finish: designation AA-M12, C22, A31.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.5 ALUMINUM FINISHES

- .1 Clear anodic finish: to designation AA--M12, C22, A31.
- .2 Appearance and properties of anodized finishes designated by Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.6 STEEL FINISHES

- .1 Finish steel clips and reinforcing steel with zinc coating to CAN/CSA-G164.
 - .1 Primer VOC limit: to 250 g/L maximum.

2.7 FABRICATION

- .1 Doors and framing to be by same manufacturer.
- .2 Fabricate doors and frames to profiles and maximum face sizes as indicated. Provide minimum 22 mm bite for insulating glazed units.
- .3 Provide structural steel reinforcement as required.
- .4 Fit joints tightly and secure mechanically.
- .5 Conceal fastenings.
- .6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 - Door Hardware.
- .7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

Part 3 Execution

3.1 EXAMINATION

- .1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for aluminum doors and frames installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .3 Anchor securely.
- .4 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.
- .5 Adjust door components to ensure smooth operation.
- .6 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.
- .7 Glaze aluminum doors and frames in accordance with Section 08 80 50 - Glazing.
- .8 Seal joints to provide weathertight seal at outside and air, vapour seal at inside.
- .9 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within the aluminum work except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
 - .3 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
 - .4 Clean aluminum with damp rag and approved non-abrasive cleaner.
 - .5 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
 - .6 Clean glass and glazing materials with approved non-abrasive cleaner.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by aluminum door and frame installation.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 05 50 00 - Metal Fabrication.
- .2 Section 08 80 50 - Glazing.
- .3 Section 09 91 13 – Exterior Painting.
- .4 Section 09 91 23 - Interior Painting.
- .5 Division 26: Electrical power supply.

1.2 REFERENCES

- .1 The Aluminum Association Inc. (AAI)
 - .1 Designation System for Aluminum Finishes -2003.
- .2 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A1008/A1008M-16, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - .2 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM D523-14, Standard Test Method for Specular Gloss.
 - .4 ASTM D822-13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.105-M91, Quick-Drying Primer.
 - .2 CAN/CGSB 1.181-99, Ready Mixed Organic Zinc Rich Coating.
- .4 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-G164-M92(R1998), Hot Dip Galvanizing of Irregularly Shaped Articles.
- .5 Green Seal Environmental Standards
 - .1 Standard GC-03-93, Anti-Corrosive Paints.
 - .2 Standard GS-11-97, Architectural Paints.
- .6 South Coast Air Quality Management District (SCAQMD), California State
 - .1 SCAQMD Rule 1113-2016, Architectural Coatings.

1.3 SYSTEM DESCRIPTION

- .1 Design Requirements:
 - .1 Design exterior door assembly to withstand windload of 1 kPa with a maximum horizontal deflection of 1/240 of opening width.

- .2 Design door panel assemblies with thermal insulation factor 2,89 RSI.
- .3 Design door assembly to withstand minimum 16,425 cycles per annum, and 164250 total life cycle.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide shop drawings
 - .1 Indicate materials, operating mechanisms, required clearances [and electrical connections.
- .2 Quality Control Submittals:
 - .1 Manufacturer's Instructions: manufacturer's installation instructions.
- .3 Closeout Submittals:
 - .1 Provide maintenance data for vertical lift door panels and hardware and components for incorporation into manual.

Part 2 Products

2.1 MATERIALS

- .1 Galvanized steel sheet: commercial quality Z275 zinc coating.
- .2 Steel sheet: commercial quality to ASTM A1008/A1008M factory applied manufacturer's standards.
- .3 Aluminum sheet: mill finish embossed pattern utility sheet.
- .4 Anodized aluminum sheet: embossed pattern anodizing quality aluminum sheet.
- .5 Aluminum extrusions: Aluminum Association alloy AA6063-T5.
- .6 Primer: to CAN/CGSB-1.105 for steel surfaces, CAN/CGSB-1.213 for aluminum surfaces, CGSB1.181 for galvanized steel surfaces.
- .7 Insulation: to meet design requirements.
- .8 Glazing: 08 80 50.
- .9 Cable: multi-strand galvanized steel aircraft cable, manufacturer's standard, minimum 6 mm thick.

2.2 DOORS

- .1 Fabricate 45 mm thick insulated flush panel doors of interlocking roll formed steel sections as indicated.
- .2 Insulated sections to be fabricated from pre-painted, hot-dipped galvanized steel, with rigid polyurethane core, CFC free.
- .3 Face sheet: stucco embossed flush design, 0.5 mm thickness.
- .4 Sections to be thermally broken, with weather lap joints.
- .5 .13 mm thick (16 ga) galvanized steel and caps.
- .6 Continuous internal reinforcement for hardware attachment.

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- .7 Finish: manufacturer's polyester coating system, in colour as selected by Department Representative.

2.3 HEAVY DUTY INDUSTRIAL HARDWARE

- .1 Track: low head room hardware with 75 mm size 2.66 mm core thickness galvanized steel track.
- .2 Track Supports: 2.3 mm core thickness continuous galvanized steel angle track supports.
- .3 Spring counter balance: heavy duty oil tempered torsion spring with manufacturers standard brackets.
 - .1 Drum: 200 mm diameter die cast aluminum.
 - .2 Shaft: 32 mm diameter galvanized steel.
- .4 Top roller carrier: galvanized Steel 3.04 mm thick adjustable.
- .5 Rollers: full floating grease packed hardened steel, ball bearing 75mm diameter solid steel tire.
- .6 Roller brackets: adjustable, minimum 2.5 mm galvanized steel.
- .7 Hinges: heavy duty, as recommended by manufacturer.
- .8 Cable: 6 mm diameter galvanized steel aircraft cable.
- .9 Metal mounting plates as per Section 05 50 00 Metal Fabrications.
- .10 See Electrical Drawings for door operator locations. Door operators to be supplied with door hardware, and included under specification Section 08 71 00 Door hardware.

2.4 ACCESSORIES

- .1 Overhead horizontal track and operator supports: galvanized steel, type and size to suit installation.
- .2 Track guards: 5 mm thick formed sheet 1500 mm high track guards.
- .3 Pusher springs.
- .4 Handles.
 - .1 Handles: interior only.
 - .1 Interior flat bar across full door latch width and electric interlock switch.
 - .2 No outside operating hardware.
- .5 Weather stripping.
 - .1 Sills: bulb type full width extruded neoprene weatherstrip.
 - .2 Jambs and head: extruded aluminum and arctic grade vinyl weatherstrip to manufacturer's standard.
- .6 Finish ferrous hardware items with minimum zinc coating of 300 g/m² to CSA G164.

2.5 ALUMINUM FINISHES

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

- .1 As fabricated mill finish: designation AA-Clear Anodized.

2.6 OPERATORS

- .1 Equip doors for operation by:
 - .1 Hand, two handles on inside face of door.
 - .2 Chain hoist with galvanized steel chain.
- .2 Cable fail safe device.
 - .1 Able to stop door immediately if cable breaks on door free fall. Braking capacity 500 kg.

2.7 ELECTRICAL OPERATOR

- .1 Electrical jack shaft type operator.
- .2 Electrical motors, controller units, remote pushbutton stations, relays and other electrical components: to CSA approval with CSA enclosure type 1.
- .3 Power supply: 208 V, 3 phase, 60 Hz.
 - .1 Motor: 2.23 kW, 208 V, 3 phase.
- .4 Controller units with integral motor reversing starter, solenoid operated brake 3 heater elements for overload protection, including pushbuttons and control relays as applicable.
- .5 Operation: electric.
 - .1 Remote pushbutton stations: flush mounted, in 1 locations, with "OPEN-STOP-CLOSE" designations on pushbuttons in English and French. "OPEN" and "STOP" functions activated by momentary contact. "CLOSE" function activated by constant pressure button.
- .6 Safety switch: combination roll rubber with limit switches for full length of bottom rail of bottom section of door, to reverse door to open position when coming in contact with object on closing cycle.
- .7 For jack shaft operators:
 - .1 Provide floor level disconnect device to allow for manual operation in event of power failure.
 - .2 Equip Operator with:
 - .1 Electrical interlock switch to disconnect power to operator when in manual operation.
 - .2 Built-in chain hoist for manual operation in event of power failure.
 - .3 Each operator to have a dedicated disconnect switch, located adjacent to pushbutton station
- .8 Automatic illumination complete with time delay, self extinguishing.
- .9 Door speed: 300 mm per second.
- .10 Control transformer: for 24 VAC control voltage.
- .11 Mounting brackets: galvanized steel, size and gauge to suit conditions.

- .1 Provide all accessories required to install overhead door components, including if required, steel plates, brackets, shims, spacers and the like, to the approval of Department Representative in accordance with Section 05 50 00 Metal Fabrications.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Install doors and hardware.
- .2 Touch up doors with primer where galvanized finish damaged during fabrication.
- .3 Install electrical motor, controller units, pushbutton stations, relays and other electrical equipment for door operation.
- .4 Installation includes electric wiring from power supply located near door opening.
- .5 Lubricate springs and adjust door operating components to ensure smooth opening and closing of doors.
- .6 Adjust operable parts for correct function.
- .7 Adjust weatherstripping to form weathertight seal.

3.3 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Remove traces of primer, caulking; clean doors and frames.
- .3 Clean glass and glazing materials with approved non-abrasive cleaner.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 00 00 01 – Standard Contract Specifications.
- .2 Section 07 21 20 - Low Expanding Foam Sealant.
- .3 Section 07 26 00 – Vapour Retarders.
- .4 Section 07 27 00.01 – Air Barriers.
- .5 Section 07 62 00 - Metal Flashing and Trim: Flashings.
- .6 Section 07 92 00 - Joint Sealants.
- .7 Section 08 80 50 - Glazing.

1.2 REFERENCES

- .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 T1R-A1-04, 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
 - .1 ASTM A36/A36M-08, Specification for Carbon Structural Steel.
 - .2 ASTM A123/A123M-09, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A167-99(2009), Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

- .4 ASTM A653/A653M-15e1, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .5 ASTM B209-14, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .6 ASTM B221-14, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .7 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.
- .8 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.
- .9 ASTM E331-00(2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
- .10 ASTM E413-16, Classification for Rating Sound Insulation.
- .11 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 1.108-M89, Bituminous Solvent Type Paint.
 - .2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
- .5 CSA International
 - .1 CSA G40.20/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA S136-12, 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-M1991(R2013), Welded Aluminum Construction.
- .6 Society for Protective Coatings (SSPC)
 - .1 SSPC - Paint 20-02(R2004), Zinc Rich Coating, Type I - Inorganic and Type II - Organic.
 - .2 SSPC - Paint 25 - 97(R2004) BCS, Zinc Oxide, Alkyd, Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.
- .7 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2016, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2017, Adhesives and Sealants Applications.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Co-ordination: co-ordinate work of this Section with installation of air barrier placement, vapour retarder placement, flashing placement, installing ductwork to rear of louvres, components or materials.
- .2 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.

1.4 ACTION AND INFORMATIONAL 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 Shop Drawings:
 - .1 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.
- .3 Delegated Design Submittals:
 - .1 Include framing member structural and physical characteristics, dimensional limitations, special installation requirements.
- .4 Test Reports:
 - .1 Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

1.5 CLOSEOUT SUBMITTALS

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

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements:
 - .1 Conform to applicable code for acoustic attenuation, sound transmission, requirements.

1.7 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, indoors, in dry location 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, strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- .5 Replace defective or damaged materials with new.

1.8 AMBIENT CONDITIONS

- .1 Install sealants when ambient and surface temperature is above 5 degrees C minimum.
- .2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

1.9 WARRANTY

- .1 Contractor hereby warrants that glazed aluminum curtain wall will function as specified in accordance with CCDC 24, but for 60 months.

Part 2 Products

2.1 MATERIALS

- .1 Aluminum Extrusions: to ASTM B221, thermosetting quality.
- .2 Sheet Aluminum: to ASTM B209, thermosetting quality.
- .3 Steel Reinforcement: to CSA-G40.20/G40.21M, grade 300 W.
- .4 Fasteners: cadmium plated steel finished to match adjacent material.

2.2 ALUMINUM CURTAIN WALL

- .1 Construct thermally broken frames of aluminum extrusions with minimum wall thickness of 3.0 mm. Reinforce as required to meet the requirements of NBCC for location of building.
- .2 Curtain Wall sizes:
 - .1 Window mullions: 50.8 mm x 401.6 mm deep.
 - .2 Exterior cap: 50.8 mm x 19.1mm.
 - .3 Overall: 153.9 mm.
- .3 Glazing: Refer to Section 08 80 50 – Glazing.

2.3 ALUMINUM FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Factory applied thermosetting fluoropolymer coating to AAMA 605.2 specification for Curtain Wall and Spandrel Face Panels.

- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.
- .3 Color for Curtain Wall: as selected from manufacturer's standard color range.

2.4 STEEL FINISHES

- .1 Finish steel clips and reinforcing steel with steel primer to CGSB 1-GP-40M.

2.5 AIR VAPOUR BARRIER

- .1 Self-adhering sheet membrane: as specified in Section 07 27 00.01 – Air Barriers—Performance.

2.6 FABRICATION

- .1 Provide structural steel reinforcement as required.
- .2 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- .3 Fit joints tightly and secure mechanically. Make joints flush, hairline, and weatherproof.
- .4 Prepare components to receive anchor devices. Install anchors.
- .5 Arrange fasteners and attachments to ensure concealment from view.
- .6 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.
- .7 Visible manufacturer's identification labels not permitted.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify dimensions, tolerances, and method of attachment with other work.
- .2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 INSTALLATION

- .1 Install curtain wall system in accordance with manufacturer's instructions.
- .2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- .3 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.
- .4 Set frames plumb, square, level at correct elevation in alignment with adjacent work.
- .5 Provide thermal isolation where components penetrate or disrupt building insulation.
- .6 Anchor securely.

- .7 Install sill flashings.
- .8 Adjust operable parts for correct function.
- .9 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.
- .10 Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- .11 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.3 GLAZING

- .1 Glaze curtain wall in accordance with Section 08 80 50 - Glazing.

3.4 CAULKING

- .1 Seal joints to provide weathertight seal at outside and air vapour seal at inside.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within the aluminum work except where exposed use is permitted by Owner's Representative.

3.5 CLEANING

- .1 Remove protective material from prefinished aluminum surfaces.
- .2 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.
- .3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 21 20 - Low Expanding Foam Sealant.
- .2 Section 07 92 00 - Joint Sealants.
- .3 Section 08 80 50 - Glazing.

1.2 REFERENCES

- .1 Aluminum Association (AA)
 - .1 AA DAF 45-03(R2009), Designation System for Aluminum Finishes.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
 - .2 CAN/CGSB-79.1-M91, Insect Screens.
- .3 CSA International
 - .1 CSA-A440-11, NAFS - North American Fenestration Standard/Specification for windows, doors, and skylights.
 - .2 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.
- .4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
 - .1 SCAQMD Rule 1113-A2016, Architectural Coatings.
 - .2 SCAQMD Rule 1168-A2017, Adhesives and Sealants Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for windows and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings:
 - .1 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units elevations of unit, anchorage details, location of isolation coating, description of related components, exposed finishes, fasteners, and caulking. Indicate location of manufacturer's nameplates.
- .4 Test and Evaluation Reports:

- .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
 - .1 Windows.
 - .2 anodized finish, weathering characteristics.
 - .3 Air tightness.
 - .4 Water tightness.
 - .5 Wind load resistance.
 - .6 Condensation resistance.
 - .7 Forced entry resistance.

1.4 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for windows for incorporation into manual.

1.5 QUALITY ASSURANCE

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

1.6 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 Store materials off ground, indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect windows from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Materials: to CSA-A440/A440.1 supplemented as follows:
- .2 All windows by same manufacturer.
- .3 Sash: aluminum thermally broken.
- .4 Main frame: aluminum thermally broken.
- .5 Glass: in accordance with Section 08 80 50 Glazing.
- .6 Screens: to CAN/CGSB-79.1.
 - .1 Insect screening mesh: count 18 x 14

- .2 Fasteners: tamper proof
- .3 Screen frames: aluminum, colour to match window frames
- .4 Mount screen frames for exterior replacement.
- .5 Provide screens to cover operable portion of window.
- .7 Ensure that different types of metal sills are indicated. Also, ensure that accessories are correct for sill type specified.
- .8 Exterior metal sills: extruded aluminum of type and size to suit job conditions; minimum 3 mm thick, complete with joint covers, jamb drip deflectors, chairs, anchors, anchoring devices.
- .9 Isolation coating: alkali resistant bituminous paint.
- .10 Sealants:
 - .1 VOC limit to SCAQMD Rule 1168.

2.2 WINDOW TYPE AND CLASSIFICATION

- .1 Types:
 - .1 Projected: top projected with insulating glass.
 - .2 Fixed: with insulating glass.
 - .3 Screens: on ventilating portion of windows.
- .2 Classification rating: to CSA-A440/A440.1.
 - .1 Air tightness: A3.
 - .2 Water tightness: B7.
 - .3 Wind load resistance: C5.
 - .4 Condensation resistance: Temperature Index, I40.
 - .5 Forced Entry: F1.
 - .6 Insect Screens: S1.
 - .7 Glazing: G1.
- .3 Energy ratings: windows to be Energy Star certified to Canadian Standards Association for Alma Region of New Brunswick.

2.3 FABRICATION

- .1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:
- .2 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less and plus or minus 3 mm for units with a diagonal measurement over 1800 mm.
- .3 Face dimensions detailed are maximum permissible sizes.
- .4 Brace frames to maintain squareness and rigidity during shipment and installation.
- .5 Finish steel clips and reinforcement with 380 g/m² zinc coating to ASTM A123/A123M.

2.4 ALUMINUM FINISHES

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

- .1 Clear anodic finish: designation AA- A41.

2.5 ISOLATION COATING

- .1 Coatings: in accordance with manufacturer's recommendations for surface conditions.

- .1 Coating: VOC limit to SCAQMD Rule 1113.

- .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.

2.6 GLAZING

- .1 Glaze windows in accordance with CSA-A440/A440.1.

2.7 HARDWARE

- .1 Hardware: stainless steel or white bronze sash locks and aluminum handles to provide security and permit easy operation of units.

- .2 Locks: provide operating sash with spring loading locking device, to provide automatic locking in closed position.

- .3 Where windows latching devices are located in excess of 1900 mm above floor level:

- .1 Equip projected units with roto operators with locking handle.

- .4 Tie back and life line anchors: to CAN/CSA-Z91, 2 per window.

2.8 AIR BARRIER AND VAPOUR RETARDER

- .1 Provide low expanding, single component polyurethane foam sealant installed at head, jamb and sill perimeter of window for sealing to building air barrier, vapour retarder and window 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. Refer to Section 07 21 20 – Low Expanding Foam Sealant.

Part 3 Execution

3.1 EXAMINATION

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

- .1 Visually inspect substrate in presence of Departmental Representative.

- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

- .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Window installation:
 - .1 Install in accordance with CSA-A440/A440.1.
 - .2 Arrange components to prevent abrupt variation in colour.
- .2 Sill installation:
 - .1 Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.
 - .2 Cut sills to fit window opening.
 - .3 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm on centre in between.
 - .4 Fasten expansion joint cover plates and drip deflectors with self tapping stainless steel screws.
 - .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.
- .3 Caulking:
 - .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
 - .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealants. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
- .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by window installation.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 - .1 ANSI/BHMA A156.9-2015, Cabinet Hardware.
 - .2 ANSI/BHMA A156.11-2014, Cabinet Locks.
 - .3 ANSI/BHMA A156.16-2013, Auxiliary Hardware.
 - .4 ANSI/BHMA A156.18-2016, Materials and Finishes.
 - .5 ANSI/BHMA A156.20-2012, Strap and Tee Hinges and Hasps.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for cabinet hardware and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Hardware List:
 - .1 Submit contract hardware list.
 - .2 Indicate specified hardware, including make, model, material, function, finish and other pertinent information.
- .4 Manufacturer's Instructions: submit manufacturer's installation instructions.

1.3 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: submit operation and maintenance data for cabinet hardware for incorporation into manual.

1.4 QUALITY ASSURANCE

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

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 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .4 Storage and Handling Requirements:
 - .1 Store materials in locked dry location.

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- .2 Store and protect cabinet hardware from nicks, scratches, and blemishes.
- .5 Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

Part 2 Products

2.1 HARDWARE ITEMS

- .1 Use one manufacturer's product for all similar items.

2.2 CABINET HARDWARE

- .1 Cabinet hardware: to ANSI/BHMA A156.9, designated by letter B and numeral identifiers as listed below.
 - .1 Hinges: European style hinge with 110° swing of operation for face frame construction cabinets.
 - .2 Pulls: surface mounted pull. Barrier-free compliant.
 - .3 Knobs: surface mounted knob. Barrier-free compliant
 - .4 Latches: elbow latch.
 - .5 Catches: friction catch.
 - .6 Shelf rests and standards: adjustable shelf standards, with open shelf rests.
 - .7 Shelf brackets and standards: vertical slotted shelf standard, with shelf brackets.
 - .8 Drawer slides: side mounted drawer slides, soft close.

2.3 FASTENINGS

- .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Use fasteners compatible with material through which they pass.

Part 3 Execution

3.1 INSTALLATION

- .1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Install hardware to standard hardware location dimensions in accordance with manufacturer's recommendations and to project design requirements.
- .3 Install key control cabinet and establish key control set-up.

3.2 ADJUSTING

- .1 Adjust cabinet hardware for optimum, smooth operating condition.
- .2 Lubricate hardware and other moving parts.

- .3 Adjust cabinet door hardware to ensure tight fit at contact points with frames.

3.3 CLEANING

- .1 Progress Cleaning:
 - .1 Leave Work area clean at end of each day.
 - .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 - .3 Remove protective material from hardware items where present.
 - .4 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.
- .2 Maintenance Staff Briefing:
 - .1 Brief maintenance staff regarding:
 - .1 Proper care, cleaning, and general maintenance of projects complete hardware.
 - .3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by cabinet and miscellaneous hardware installation.

END OF SECTION

1. General

1.1. RELATED REQUIREMENTS

1. Section 08 11 00 - Metal Doors & Frames.

1.2. REFERENCES

1. American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)
 1. ANSI/BHMA A156.1-2013, American National Standard for Butts and Hinges.
 2. ANSI/BHMA A156.2-2011, Bored and Preamsembled Locks and Latches.
 3. ANSI/BHMA A156.3-2014, Exit Devices.
 4. ANSI/BHMA A156.4-2013, Door Controls - Closers.
 5. ANSI/BHMA A156.5-2014, Auxiliary Locks and Associated Products.
 6. ANSI/BHMA A156.6-2015, Architectural Door Trim.
 7. ANSI/BHMA A156.8-2015, Door Controls - Overhead Stops and Holders.
 8. ANSI/BHMA A156.12-2013, Interconnected Locks and Latches.
 9. ANSI/BHMA A156.13-2012, Mortise Locks and Latches Series 1000.
 10. ANSI/BHMA A156.15-2015, Release Devices - Closer Holder, Electromagnetic and Electromechanical.
 11. ANSI/BHMA A156.16-2013, Auxiliary Hardware.
 12. ANSI/BHMA A156.18-2012, Materials and Finishes.
2. Canadian Steel Door and Frame Manufacturers' Association (CSDMA)
 1. CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames - 2009.

1.3. ACTION AND INFORMATIONAL SUBMITTALS

1. Submit in accordance with Section 01 33 00 – Submittal Procedures.
2. Product Data:
 1. Submit manufacturer's instructions, printed product literature and data sheets for door hardware and include product characteristics, performance criteria, physical size, finish and limitations.
3. Hardware List:
 1. Submit contract hardware list.
 2. Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
4. Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
5. Manufacturer's Instructions: submit manufacturer's installation instructions.

1.4. CLOSEOUT SUBMITTALS

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

2. Operation and Maintenance Data: submit operation and maintenance data for door hardware for incorporation into manual.

1.5. MAINTENANCE MATERIALS SUBMITTALS

1. Extra Stock Materials:
 1. Supply maintenance.
 2. Tools:
 1. Supply 2 sets of wrenches for door closers, locksets and fire exit hardware.

1.6. WARRANTY

1. Provide a written manufacturer's warranty for work of this Section for failure due to defective materials for ten (10) years, dated from substantial completion certificate.
2. Provide a written Contractor's warranty for work of this Section for failure due to defective installation workmanship for one (1) year, dated from submittal completion certificate.

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

1.8. 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. Package items of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
4. Storage and Handling Requirements:
 1. Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 2. Store and protect door hardware from nicks, scratches, and blemishes.
 3. Protect prefinished surfaces with wrapping or strippable coating.
 4. Replace defective or damaged materials with new.

1.9. MAINTENANCE SERVICE

1. Provide maintenance service for one year during warranty period to maintain all barrier free entrance automatic operators as follows:
 1. Qualified service personal approved by manufacturer of operators.
 2. Site inspection every three months will all necessary adjustment made during this visit. Separate warranty service calls, if required, will only qualify as an inspection if time of call is close to the three month intervals.

3. Make detailed reports of each visit and copy to Owner and Engineer.
4. Cost of this service will be included as part of this Section and is not covered by any allowance amount.

2. Products

2.1. HARDWARE ITEMS

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

2.2. DOOR HARDWARE

1. Locks and latches:
2. Locks and latches:
 1. Bored and preassembled locks and latches: to CAN/CGSB-69.17, 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.
 2. Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, designed for function and keyed as stated in Hardware Schedule.
 3. Knobs Lever handles : plain design.
 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 to BHMA 626.
3. Butts and hinges:
 1. Butts and hinges: to CAN/CGSB-69.18, listed in Hardware Schedule.
4. Architectural door trim: to CAN/CGSB-69.22, listed in Hardware Schedule.
5. Door protection plates: 1.27 mm thick stainless steel, finished to BMHA 630.
 1. Exit devices: to to CAN/CGSB-69.19, function, grade and finish as per schedule. Rim type with push pad design.
 2. Auxiliary item(s): door co-ordinator, type 21, for pairs of doors with overlapping astragals.
6. Door Closers and Accessories:
 1. Door controls closers: to CAN/CGSB-69.20, listed in Hardware Schedule.
 2. Door co-ordinator: surface for pairs of doors with overlapping astragal.
7. Door Operators:
 1. Power-operated pedestrian doors: to ANSI/BHMA A156.10.
8. Architectural door trim: to ANSI/BHMA A156.6, listed in Hardware Schedule.
 1. Door protection plates: 1.27 mm thick stainless steel finished to BMHA 630.
 2. Push plates: 1.27 mm thick stainless steel finished to BMHA 630.
 3. Push/Pull units: type stainless steel finished to BMHA 630.
9. Auxiliary hardware: to CAN/CGSB-69.32, listed in Hardware Schedule.

1. Combination stop and holder, floor mounted: finished to BMHA 629.
2. Surface bolt lever extension flush bolt: finish to BMHA 629.
10. 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.
11. Thresholds: to ANSI/BHMA A156.21 extruded aluminum mill finish, serrated surface, with lip and vinyl door seal insert.
12. Weatherstripping:
 1. Head and jamb seal:
 1. Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.
 2. Door bottom seal:
 1. Extruded aluminum frame and nylon brush sweep, clear anodized finish.
13. Astragal: overlapping, extruded aluminum frame with vinyl insert, finished to match doors.

2.3. MISCELLANEOUS HARDWARE

1. Indexed key control system: to ANSI/BHMA A156.5, wall mounted system, enamel paint finish.

2.4. 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.

2.5. KEYING

1. Doors, padlocks and cabinet locks to be master keyed as directed. Prepare detailed keying schedule in conjunction with Owner's Representative and owner.
2. Provide keys in triplicate for every lock in this Contract.
3. Provide six master keys for each MK or GMK group. Allow for six (6) levels of sub master keying.
4. Stamp keying code numbers on keys and cylinders.
5. Provide construction cores.
6. Provide all permanent cores and keys to Owner's Representative.
7. Supply twenty (20) blanks for each sub master group used.

3. Execution

3.1. INSTALLATION

1. Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
2. Supply metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
3. Supply manufacturers' instructions for proper installation of each hardware component.
4. Install hardware to standard hardware location dimensions in accordance with CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).
5. Where door stop contacts door pulls, mount stop to strike bottom of pull.
6. Install key control cabinet.
7. Use only manufacturer's supplied fasteners.
 1. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
8. Remove construction cores/locks when directed by Departmental Representative.
 1. Install permanent cores and ensure locks operate correctly.

3.2. ADJUSTING

1. Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
2. Lubricate hardware, operating equipment and other moving parts.
3. Adjust door hardware to ensure tight fit at contact points with frames.

3.3. CLEANING

1. Progress Cleaning:
 1. Leave Work area clean at end of each day.
 2. Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.
 3. Remove protective material from hardware items where present.
 4. Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment.

3.4. DEMONSTRATION

1. Keying System Setup and Cabinet:
 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. Place file keys and duplicate keys in key cabinet on their respective hooks.
 3. Lock key cabinet and turn over key to Departmental Representative.
2. Maintenance Staff Briefing:

1. Brief maintenance 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.

3.5. PROTECTION

1. Protect installed products and components from damage during construction.
2. Repair damage to adjacent materials caused by door hardware installation.

3.6. SCHEDULE

Heading #1 (Group: 001)

ITEM #1 1 door D100A

914 x 2134 AL DR x FR

1 Continuous Hinge	CL
1 Exit Device / Offset Pull	US32D
1 Cylinder	US26D
1 Electric Strike	630
1 Electronic Locking Device	
1 Electronic Closer	
1 Overhead Door Stop	US26D
1 Threshold	MF
1 Weather Stripping	CA
1 Door Sweeps	CA

MODE OF OPERATION: DURING REGULAR WORKING HOURS THE EXIT DEVICE WILL BE DOGGED DOWN AND ALLOW PERSON ENTRY THRU THIS DOOR BY USING THE TRIM OR PRESSING THE ACTUATORS BUTTONS WHICH WILL RELEASE THE ELECTRIC STRIKE AND ALLOW THE OPERATOR TO OPEN THE DOOR. AFTER WORKING HOURS RELEASE THE CYLINDER DOG AND LOCK THE EXIT DEVICE AND TURN THE KEY SWITCH, WHICH WILL TURN OFF THE OPERATOR. ENTRY BY KEY OR KEYPAD CODE ENTRY / REMOTE ELECTRONIC RELEASE OF POWERSTRIKE. FREE EGRESS AT ALL TIMES.

Heading #2 (Group: 002)

ITEM #2 1 Door D100B

914 x 2134 AL DR x FR

3 Standard Hinge	CL
1 Push / Offset Pulls	US32D
1 Overhead Closer	
1 Overhead Door Stop	US26D

MODE OF OPERATION: A PERSON CAN ENTER BY PULLING THE DOOR.
DOORS NEVER LOCKED

Heading #3 (group:003)

ITEM #3	1 Single door D103C
ITEM #4	1 Single door D115B
ITEM #5	1 Single door D115A
ITEM #6	1 Single door D114D
ITEM #7	1 Single door D112C

914 x 2134 x 44 - MTL DR x HM FR

15 Standard Hinge	US32D
5 Exit Device	US26D
5 Overhead Closer	US26D
5 Overhead Door Stop/Holder	US26D
5 Kick Plate (interior only)	US32D
5 Threshold	MF
5 Weather Stripping	CA
5 Door Sweep	CA

ALWAYS NEED A KEY TO GET IN, FREE EGRESS AT ALL TIMES.

Heading #4 (Group: 004)

ITEM #8	1 Double door D110B
ITEM #9	1 Double door D111B
ITEM #10	1 Double door D113B
ITEM #11	1 Double door D109B
ITEM #12	1 Double door D108B

2- 914 x 2134 x 44 - HM DR x HM FR

30 Standard Hinge	US32D
5 Locksets	US26D
5 Astragal / Top & Bottom Bolts	US26D
5 Overhead Closer	US26D
10 Overhead Door Stop/Holder	US26D
5 Thresholds	MF
5 Weather Stripping	CA
10 Door Sweeps	CA

ALWAYS NEED A KEY TO GET IN, FREE EGRESS AT ALL TIMES.

Heading #5 (Group: 005)

ITEM #13	1 Single door D103A
ITEM #14	1 Single door D103B
ITEM #15	1 Single door D102

914 x 2134 x 44 - WD DR x HM FR

ITEM #16 1 Single door D101
ITEM #17 1 Single door D108A
ITEM #18 1 Single door D114C
ITEM #19 1 Single door D109A
ITEM #20 1 Single door D112A

914 x 2032 x 44 - HM DR x HM FR

24 Standard Hinge	US32D
8 Locksets	US26D
8 Overhead Closers	US26D
8 Overhead Door Stop/Holder	US26D
6 Kick Plate (ea. side - #13,#14,#15)	US32D

LOCKABLE USING KEY ONLY, FREE EGRESS AT ALL TIMES.

Heading #6 (Group: 006)

ITEM #21 1 Single door D104
ITEM #22 1 Single door D105
ITEM #23 1 Single door D106

914 x 2032 x 44 - WD DR x HM FR

ITEM #24 1 Single door D117

914 x 2134 x 44 - HM DR x HM FR

12 Standard Hinge	US32D
4 Privacy Locksets	US26D
4 Overhead Closers	US26D
4 Overhead Stop	US26D
6 Kick Plate (ea. side - #21,#22,#23)	US32D

BATHROOM - PUSH BUTTON PRIVACY, FREE EGRESS AT ALL TIMES.

Heading #7 (Group: 007)

ITEM #25 1 Double door D110A
ITEM #26 1 Double door D111A
ITEM #27 1 Double door D112B
ITEM #28 1 Double door D113A

2 - 914 x 2134 x 44 - HM DR x HM FR

24 Standard Hinge	US32D
4 Locksets	US26D
4 Astragals / Top & Bottom Bolts	US26D
8 Overhead Door Stop/Holder	US26D

LOCKABLE USING KEY ONLY, FREE EGRESS AT ALL TIMES.

Heading #8 (Group: 008)

ITEM #29 1 Single door D114B

ITEM #30 1 Single door D116

914 x 2134 x 44 - HM DR x HM FR

6 Standard Hinge US32D

2 Locksets US26D

2 Overhead Closers US26D

2 Overhead Stop US26D

LOCKABLE USING KEY ONLY, FREE EGRESS AT ALL TIMES.

Heading #9 (Group: 009)

ITEM #31 1 Single door D201

2 - 914 x 2134 x 44 - HM DR x HM FR

6 Standard Hinge US32D

1 Lockset (NO Oper. from RM 115) US26D

2 Overhead Closers US26D

2 Overhead Stop US26D

1 Astragal / Top & Bott. Bolt US26D

DOOR TO BE CLOSED & LOCKED AT ALL TIMES OTHER THAN EQUIPMENT
LOAD/SWAP. NO EGRESS.

Heading #10 (Group: 010)

ITEM #32 1 Double door D114A

(#32A - 914 + #32B - 762) x 2134 x 44 - HM DR x HM FR

6 Standard Hinge US32D

1 Locksets (#32A) US26D

2 Overhead Closers US26D

2 Overhead Stop/Holder US26D

1 Astragal / Top & Bott. Bolts (#32B) US26D

LOCKABLE USING KEY ONLY, FREE EGRESS AT ALL TIMES.

LEGEND

US26D Satin Chromium Plated

US32D Satin Stainless Steel

EN Aluminum Enamel

CA Clear Aluminum

CL Clear Anodized Aluminum

630	Satin Stainless Steel
BL	Black
MF	Mill Finish

END OF SECTION

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 92 00 – Joint Sealants.
- .2 Section 08 11 00 – Metal Doors & Frames.
- .3 Section 08 50 00 – Windows.

1.2 REFERENCES

- .1 ASTM International
 - .1 ASTM C542-05 (2011), Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D790-15E2, 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 D2240-15, Standard Test Method for Rubber Property - Durometer Hardness.
 - .6 ASTM E84-15b, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .7 ASTM 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-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
 - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors.
 - .5 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .6 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
 - .7 CAN/CGSB-12.11-M90, Wired Safety Glass.
 - .8 CAN/CGSB-12.12-M90, Plastic Safety Glazing Sheets.
- .3 Glass Association of North American (GANA)
 - .1 GANA Glazing Manual - 2008.
 - .2 GANA Laminated Glazing Reference Manual - 2009.
- .4 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards

- .1 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
 - .1 Convene pre-installation meeting 1 week prior to beginning work of this Section, with Department Representative to:
 - .1 Verify project requirements.
 - .2 Review installation and substrate conditions.
 - .3 Co-ordination with other building subtrades.
 - .4 Review manufacturer's written installation instructions and warranty requirements.
 - .2 Arrange for site visit with Department Representative prior to start of Work to examine existing site conditions adjacent to demolition Work.
 - .3 Ensure site supervisor and project manager attend.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for glass, sealants, and glazing accessories and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
- .4 Certificates: submit product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
 - .1 Submit testing of glass.
 - .2 Low-Emitting Materials:
 - .1 Submit listing of adhesives and sealants used in building, showing compliance with VOC and chemical component limits or restrictions requirements.

1.5 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for glazing for incorporation into manual.

1.6 QUALITY ASSURANCE

- .1 Certificates: product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- .2 Mock-ups:
 - .1 Construct mock-ups in accordance with Section 01 45 00 - Quality Control.
 - .2 Construct mock-up to include glass / plastic glazing, and perimeter air barrier and vapour retarder seal.
 - .3 Mock-up will be used:
 - .1 To judge quality of work, substrate preparation, operation of equipment and material application.
 - .4 Locate where directed.
 - .5 Allow 24 hours for inspection of mock-up before proceeding with work.
 - .6 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

1.7 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 Store materials off ground, indoors in dry location 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 wrapping or strippable coating.
 - .4 Replace defective or damaged materials with new.

1.8 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.

Part 2 Products

2.1 MATERIALS

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

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- .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, mirror glazing (selected) quality, 6 mm thick.
- .3 Insulating Glass Units:
 - .1 Insulating glass units: to CAN/CGSB-12.8, double unit, minimum 25 mm overall thickness (as per NBCC for window area and climatic conditions.)
 - .1 Glass: to CAN/CGSB-12.1 (tempered)
 - .2 Glass thickness: minimum 6 mm each light (as per NBC calculations for window area and climatic conditions.)
 - .3 Inter-cavity space thickness: 13 mm.
 - .4 Glass coating: surface number 2 (inside surface of outer light), low "E".
 - .5 Inert gas: argon.
 - .6 Light transmittance: minimum 0.70.
- .4 Sealant: in accordance with Section 07 92 00 - Joint Sealants.
 - .1 VOC limit to SCAQMD Rule 1168.
 - .1 VOC limit: 5 % maximum by weight to CCD-045.
 - .2 Ensure sealant does not contain chemical restrictions to CCD-045.

2.2 ACCESSORIES

- .1 Setting blocks: neoprene, 80-90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area, length of 25 mm for each square meter of glazing, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height.
- .2 Spacer shims: neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
- .3 Glazing tape:
 - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.
- .4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.
- .5 Glazing clips: manufacturer's standard type.
- .6 Windows shall be glazed and fixed with security fasteners.
- .7 Lock-strip gaskets: to ASTM C542.

Part 3 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 Departmental Representative.
 - .4 Inform Departmental Representative 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 Departmental Representative.

3.2 PREPARATION

- .1 Clean contact surfaces with solvent and wipe dry.
- .2 Seal porous glazing channels or recesses with substrate compatible primer or sealer.
- .3 Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)

- .1 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.
- .2 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .3 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .4 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .5 Place glazing tape on free perimeter of glazing in same manner described.
- .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .7 Knife trim protruding tape.

3.4 INSTALLATION: MIRRORS

- .1 Set mirrors with clips. Anchor rigidly to wall construction.
- .2 Place plumb and level.

3.5 CLEANING

- .1 Progress Cleaning: clean in accordance with Section 01 74 11 – 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 in accordance with Section 01 74 11 – Cleaning.

3.6 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.

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 The Aluminum Association Inc. (AAI)
 - .1 AAI DAF-45-2003, Designation System for Aluminum Finishes - 9th Edition.
- .2 Air Movement and Control Association International (AMCA)
 - .1 AMCA 500-D-12, Laboratory Methods of Testing Dampers for Rating.
 - .2 AMCA 500-L-12(R2015), Laboratory Methods of Testing Louvers for Rating.
 - .3 AMCA 501-17, Application Manual for Air Louvers.
 - .4 AMCA 511-10(R2012), Certified Ratings Program for Air Control Devices.
- .3 American National Standards Institute (ANSI)
 - .1 ANSI H35.1/H35.1M-17, Alloy and Temper Designation Systems for Aluminum.
- .4 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .2 ASTM A653/A653 M-17, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .3 ASTM A1008/A1008M-16, Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened and Bake Hardenable.
 - .4 ASTM B32-08(2014), Standard Specification for Solder Metal.
 - .5 ASTM B209-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .6 ASTM B221-14, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .7 ASTM B370-12, Standard Specification for Copper Sheet and Strip for Building Construction.
 - .8 ASTM D523-14, Standard Test Method for Specular Gloss.
 - .9 ASTM D822/D822M-13, Standard Practice for Filtered Open-Flame Carbon-Arc Exposure of Paint and Related Coatings.
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.213-2004, Etch Primer (Pretreatment Coating of Tie Coat) for Steel and Aluminum.
 - .2 CAN2-93.1-M85, Sheet Aluminum Alloy, Prefinished, Residential.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals.
- .2 Product Data:

- .1 Submit manufacturer's printed product literature, specifications and datasheet and include product characteristics, performance criteria, physical size, finish and limitations.
- .2 Submit WHMIS MSDS - Material Safety Data Sheets.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of New Brunswick, Canada.
 - .2 Indicate fabrication and erection details, including anchorage, accessories, and finishes.
- .4 Samples:
 - .1 Submit duplicate samples showing colour and finish.
 - .2 Where colour is not indicated, submit manufacturer's standard colours to Departmental Representative for selection.
- .5 Quality Assurance Submittals:
 - .1 Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence, cleaning procedures.
- .6 Closeout Submittals:
 - .1 Provide operation and maintenance data for manual or motorized operated louvres for incorporation into manual.

1.3 DELIVERY, STORAGE AND HANDLING

- .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Common Product Requirements.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .3 Deliver materials to the site in undamaged condition.
- .2 Storage and Protection:
 - .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Protect louvres from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.

Part 2 Products

2.1 MATERIALS

- .1 Weather resistant louvres, with bird screens made to withstand a wind load of not less than 1.44 kilopascals.
- .2 Wall louvers: complete with AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 511.

- .3 Ratings to indicate water penetration of 0.06 kilograms or less per square meter of free area at free velocity of 244 meters per minute.
- .4 Galvanized steel sheet: commercial quality to ASTM A653/A653M with Z275 zinc coating.
- .5 Steel sheet: commercial quality to ASTM A1008/A1008M with Class I matte finish.
- .6 Aluminum sheet: to ASTM B209.
- .7 Aluminum extrusions: to ASTM B221 alloy 6063- T5.
- .8 Nails and fasteners: same material as fabricated items.
- .9 Gaskets: vinyl.
- .10 Primer: to CAN/CGSB-1.213 aluminum surfaces.
- .11 Aluminum Sheet: ASTM B209M, Alloy 3003 or 5005 with temper as required for forming, or as otherwise recommended by metal producer for required finish.
- .12 Aluminum Castings: ASTM B26/B26M, Alloy 319.
- .13 Screens:
 - .1 Insect screens: 0.3 mm diameter aluminum wire 18 x 14 mesh with 60% free area, secured to aluminum frame.
 - .2 Bird Screen: Aluminum, 13 mm x 13 mm (1/2" x 1/2") mesh, 1.6 mm (0.063"), intercrimped. Frame: Removable.
- .14
- .15 Extruded aluminum louvres:
 - .1 Louvre Depth: 35 mm
 - .2 Construct louvres from aluminum extrusions of minimum 3 mm thickness to sizes and shapes indicated.
 - .3 Arrange blades, mullions and frame extrusions as indicated.
 - .4 Install concealed vertical stiffeners spaced to meet required loads.
 - .5 Complete louvre assembly to have 48% free area.
- .16 Adjustable louvres:
 - .1 Construct manually adjustable louvres from aluminum extrusions of minimum 3 mm thickness.
 - .2 Arrange blades, mullions and frame extrusions as indicated.
 - .3 Center pivot stormproof type blades with two reinforcing bosses with pinions operating in self-lubricating nylon bearings.
 - .4 Arrange blades to be operated by concealed drive arms at each jamb connect drive arms by torsion bars operating in nylon bearings.
 - .5 Equip louvre blades and sills with vinyl gasket weather seals. mechanically fasten vinyl gaskets to ends of louvre blades to provide jamb weather seal.
 - .6 Complete louvre assembly to have 48 % free area when in open position.
 - .7 Provide louvres with manual hand crank operator with removable crank.

2.2 FINISHES

- .1 Finish exposed surfaces of aluminum components in accordance with AAI DAF-45 for Aluminum Finishes.
 - .1 Electrolytically deposited colour anodic finish: colour as selected by Departmental Representative's.
- .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

- .1 Install louvres and vents where indicated.
- .2 Set adjustable louver blades for uniform alignment in open and closed positions.
- .3 Adjust louvres so moving parts operate smoothly.
- .4 Attach bird and insect screen to inside face of louver or vent.
- .5 Repair damage to louvres and vents to match original finish.
- .6 Install wall louvers using stops, mouldings, flanges, strap anchors, and jamb fasteners as appropriate for wall construction and in accordance with manufacturer's recommendations.

3.3 CLEANING

- .1 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

3.4 PROTECTION

- .1 Paint copper or copper-bearing alloys in contact with dissimilar metal with heavy-bodied bituminous paint or separate with inert membrane.
- .2 Where aluminum contacts metal other than zinc, paint dissimilar metal with primer and two coats of aluminum paint.
- .3 Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.
- .4 Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or coat of heavy-bodied bituminous paint.

END OF SECTION