Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 06 10 00 – Rough Carpentry

.3 Section 07 92 00 – Joint Sealing

.4 Section 08 71 00 – Door Hardware – General

.5 Section 08 80 00 – Glazing

.6 Section 09 90 00 – Painting

.7 Division 26 – Electrical

1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM).

.1 ASTM A 653M-95, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process or latest.

.2 ASTM B 29-[92], Specification for Pig Lead or latest.

.3 ASTM B 749-85(1991), Specification for Lead and Lead Alloy Strip, Sheet and Plate Products or latest.

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-1.181-92, Ready-Mixed Organic Zinc-Rich Coating or latest.

.2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors or latest.

.3 CAN/CGSB-51.20-M87, Thermal Insulation, Polystyrene, Boards and Pipe Covering or latest.

.4 CGSB 51-GP-21M-78, Thermal Insulation, Urethane and Isocyanurate, Unfaced or latest.

.3 Canadian Standards Association (CSA).

.1 CSA A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings or latest.

.2 CAN/CSA-G40.21-M92, Structural Quality Steels or latest.

.3 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding) or latest.

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

.1 CSDFMA, Specifications for Commercial Steel Doors and Frames, 1990 or latest.

.2 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990 or latest.

.5 National Fire Protection Association (NFPA).

.1 NFPA 80-1992, Fire Doors and Windows or latest.

.2 NFPA 252-1990, Door Assemblies, Fire Tests of or latest.

.6 Underwriters' Laboratories of Canada (ULC).

.1 CAN4-S104M- M80(R1985), Fire Tests of Door Assemblies or latest.

.2 CAN4-S105M-M85, Fire Door Frames or latest.

1.3 DESIGN REQUIREMENTS

.1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35ºC to 35ºC.

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

1.4 SHOP DRAWINGS

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

.2 Indicate each type of door, Material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazing, louvers, arrangement of hardware and fire rating and finishes.

.3 Indicate each type frame Material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and reinforcing, fire rating, finishes.

.4 Include schedule identifying each unit, with door marks and numbers relating to numbering on Drawings and door and interior glazing schedule.

.5 Submit test and engineering data, and installation instructions.

1.5 REQUIREMENTS OF REGULATORY AGENCIES

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M or latest for ratings specified or indicated.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104 or latest, ASTM E 152 or latest or NFPA 252 or latest 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.

1.6 SCHEDULE

.1 Doors and frames listed on door schedule and interior glazing schedule are furnished as an assistance to the fabricator, and should not be considered as entirely inclusive. Examine Drawings and Specifications, and determine extent and quantity required. Should any door or frame be omitted in the schedule, the fabricator shall supply door or frame as required for similar or same purpose.

Part 2 Products

2.1 MATERIALS - STEEL

.1 Hot dipped galvanized steel sheet: to ASTM A 653M or latest, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts or latest.

.2 Reinforcement channel: to CAN/CSA-G40.21 or latest, Type 44W, coating designation to ASTM A 653M or latest.

.3 Cast or rolled pure sheet lead: to ASTM B 29 or latest, weight: 14.6 kg/m2, thickness 1.2 mm.

.4 Composites: balance of core Materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

2.2 DOOR CORE MATERIALS

.1 Honeycomb construction:

.1 Structural small cell, 24.5mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m3 minimum sanded to required thickness.

.2 Stiffened: face sheets welded, insulated core.

.1 Fibreglass: to CSA A101 or latest, semi-rigid RSI 2.3.

.2 Polyurethane: to CGSB 51-GP-21M or latest rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m3.

.3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250ºC at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104 or latest, ASTM E 152 or latest or NFPA 252 or latest, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

.4 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 ozone depletion potential (ODP) available.

2.3 ADHESIVES

.1 Select Adhesives which:

.1 do not contain volatile organic compounds in excess of 5 % by weight as measured by EPA Method 24-24A, 40 C.F.R., Part 60, Appendix A (1991), as demonstrated through calculation from records of the amounts of constituents used to make the product;

.2 are accompanied by detailed instructions for proper application so as to minimize health concerns and maximize performance;

.3 are accompanied by information describing proper disposal methods for containers.

.2 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.

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

.4 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.4 PRIMERS

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

2.5 PAINT

.1 Steel doors and frames shall be field painted in accordance with Sections 09 90 00. Weatherstrips shall be protected from paint. Finish shall be free of scratches or other blemishes.

.2 Paint: water based, manufactured without compounds which contribute to ozone depletion in the upper atmosphere, does not contain toxic metal pigments.

2.6 ACCESSORIES

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

.2 Exterior top and bottom caps: steel.

.3 Interior top and bottom caps: steel.

.4 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.

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

.6 Fire labels: metal riveted.

.7 Glazing: as per Section 08 80 00.

.8 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.

2.7 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDFMA Specifications.

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

.3 Exterior frames: 16 gauge minimum thermally broken type construction.

.4 Interior frames: 16 gauge minimum 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 Provide appropriate anchorage to floor and wall construction.

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

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

.4 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.

.5 Frames for installation in stud partitions shall be provided with steel anchors of suitable design. For installation inside each jamb as follows:

.1 Frames up to 2300mm (7’-8”) height – four (4) anchors

.2 Frames 2300mm (7’-8”) to 2450mm (8’-2”) – five (5) anchors

2.9 LABELED FIRE DOORS AND FRAMES

.1 Provide labeled fire doors and frames for openings requiring fire protection ratings as scheduled, and generally in the following locations: firewalls and fire separations, corridors, stairwells, and to storage and mechanical rooms. Attach ULC labels to doors and frames.

.2 Doors with bottom vertical rods must be sized to provide proper bottom clearance.

2.10 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59 or latest.

.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.

.7 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

2.11 DOOR FABRICATION GENERAL

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

.2 Exterior doors: Insulated Core construction. Interior doors: honeycomb construction.

.3 Fabricate doors with longitudinal edges welded. 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 E 330 or latest.

.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 PVC 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 or latest, ASTM E 152 or latest or NFPA 252 or latest 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.

2.12 DOORS: HONEYCOMB CORE CONSTRUCTION

.1 Form each face sheet for exterior doors from 16 gauge sheet steel with polyurethane core laminated under pressure to face sheets.

.2 Form each face sheet for interior doors from 16 gauge sheet steel with temperature rise rated core laminated under pressure to face sheets.

2.13 HOLLOW STEEL CONSTRUCTION

.1 Form each face sheet for exterior doors from 16 gauge minimum sheet steel.

.2 Form each face sheet for interior doors from 16 gauge minimum 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 polyurethane core.

.5 Fill voids between stiffeners of interior doors with temperature rise rated core.

2.14 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 or latest.

.3 Apply insulation.

Part 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 CSDFMA 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 Caulk perimeter of frames between frame and adjacent Material.

.6 Maintain continuity of air/vapour barrier membrane.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Door Schedule.

.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, top of carpet, noncombustible sill, and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

.4 Install louvers as indicated.

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 GLAZING

.1 Install glazing for doors in accordance with Section 08 80 00 - Glazing.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 07 92 00 – Joints Sealing

.3 Section 08 44 13 – Glazed Aluminum Curtain Walls

.4 Section 08 71 00 – Door Hardware - General

.5 Section 08 80 00 – Glazing

.6 Division 26 – Electrical

1.2 REFERENCES

.1 Aluminum Association (AA)
  .1 DAF 45 2003, Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).
  .1 AAMA-2603-2013, Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  .2 AAMA-2604-2013, Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
  .3 AAMA-2605-2013, Voluntary Specification, Performance Requirements andTest Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  .4 AAMA CW-10-2012, Care and Handling of Architectural Aluminum From Shop to Site.

.3 ASTM International (ASTM).
  .1 ASTM B209-2010, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  .2 ASTM B221-2013, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  .3 ASTM C612 – 2014, Standard Specification for Mineral Fiber Block and Board Thermal Insulation.
  .4 ASTM E283-2012, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
  .5 ASTM E331 - 2009, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.
  .6 ASTM E1105 – 2008, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
  .7 ASTM D2240 – 2010, Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canadian General Standards Board (CGSB).
  .1 CAN/CGSB-12.8-97, Insulating Glass Units.
  .2 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings.
  .3 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.5 CSA International (CSA)
  .1 CAN/CSA-S157-2005, Strength Design in Aluminum.
  .2 CAN/CSA W59.2-M1991(R2003), Welded Aluminum Construction.

.6 Environmental Choice Program (ECP)
.1 CCD-45-1995, Sealants and Caulking Compounds.

1.3 DESIGN CRITERIA

.1 Design frames and doors in exterior walls to:

.1 Accommodate expansion and contraction within service temperature range of -35 to 35ºC.

.2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E 330 under wind load of 1.2 kpa.

1.4 SUBMITTALS

.1 Make submittals in accordance with Contract Conditions and Section 01 33 00 Submittal Procedures.

.2 Product Data: Submit product data including manufacturer's literature for aluminum, panels, styles, rails, components and accessories, indicating compliance with specified requirements and material characteristics.

.1 Submit list on aluminum door manufacturer's letterhead of materials, components and accessories to be incorporated into Work.

.2 Include product names, types and series numbers.

.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings: Submit drawings stamped and signed by Professional Engineer registered in the province of Manitoba, Canada. Include on shop drawings:

.1 Indicate materials and profiles and provide full-size, scaled details of components for each type of door. Indicate:

.1 Core thicknesses of components.

.2 Type and location of exposed finishes.

.3 Size of door opening and tolerances.

.4 Arrangement of hardware and required clearances.

.2 Include catalogue details for each type of door illustrating profiles, dimensions and methods of assembly.

.4 Samples:

.1 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections showing prefinished aluminum surface, finish, colour and texture, and including section of infill panel.

.1 Include corner sample of each type of door.

.2 Submit duplicate 300 x 300 mm (12 x 12 inches) sample sections of insulating glass unit showing glazing materials and edge and corner details.

.5 Test Reports:

.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.6 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representatives site visit and inspection.

.7 Installer Qualifications:

.1 Submit letter verifying installer's experience with work similar to work of this Section.

1.5 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.6 PROTECTION

.1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.

.2 Leave protective covering in place until final cleaning of building.

1.7 DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver material in accordance with Section 01 60 00 - Basic Product Requirements.

.2 Deliver aluminum door materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.

.2 Store materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

Part 2 Products

2.1 MANUFACTURER

.1 Acceptable Product: Manufacturer: Alumicor or approved equivalent in accordance with B7 Substitutions.

2.2 DESCRIPTION

.1 Aluminum-framed swing door with glass insert suitable for inclusion in curtain wall or storefront system.

2.3 DESIGN CRITERIA

.1 Design aluminum components to [CAN/CSA S157].

.2 Vision glass areas: Insulating Glass Unit in accordance with Section 08 80 50 Glazing.

.3 Air infiltration: 0.3 L/s/m^2 (0.63 cfm) maximum of wall area at differential pressure across assembly of 300 Pa (0.044 psi).

2.4 MATERIALS

.1 Aluminum Door Components:

.1 Extruded aluminum: To ASTM B221, 6063 alloy with T5 temper.

.2 Sheet aluminum: To ASTM B209, utility grade for unexposed surfaces, anodizing quality for exposed surfaces.

.3 Fasteners, screws and bolts: Cadmium plated stainless steel series to meet curtain wall requirements and as recommended by manufacturer.

.4 Vision glass for interior single glazed door: 6 mm (0.25 inches) clear tempered glass.

.5 Insulating glass units for exterior glazed door: In accordance with Section 08 80 50 Glazing.

2.5 DOOR FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.

.1 Ensure stiles and rails are tubular extrusions designed for mechanical shear block fastening in combination with SIGMA deep penetration plug welds and fillet welds at all stile/rail connections.

.3 Door Thickness: 50.1mm (2 inches).

.4 Construct doors square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.5 Accurately fit and secure joints and corners.

.1 Ensure joints are flush and hairline

.6 Use only concealed or semi-concealed fasteners

.1 Where fasteners cannot be concealed, countersunk screws finished to match adjacent material may be used.

.7 Install door hardware.

.8 Acceptable Material: Phantom Door as manufactured by Alumicor.

2.6 FINISHES

.1 Exterior exposed aluminum surfaces: To AA DAF-45-M12C22A44. Architectural Class I, black anodized 18 µm (0.0007 inches)] minimum thickness.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.Flashings: refer to Section 07 62 00 – Sheet Metal Flashing and Trim and provide isolation coating.

.2 Interior exposed aluminum surfaces: To AA DAF-45-M12C22. Architectural Class I, black anodized 18 µm (0.0007 inches)] minimum thickness.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

2.7 HARDWARE

.1 Hardware: In accordance with Section 08 71 00 – Door Hardware.

.2 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 - Door Hardware.

2.8 ACCESSORIES

.1 Gasketing: To CCD-45 EPDM gaskets.

.2 Setting Blocks: To CCD-45 and ASTM D2240, silicone, 80 - 90 Shore A Durometer hardness.

.3 Spacers: To CCD-45 and ASTM D2240, silicone, 50 - 60 Shore A Durometer hardness.

.4 Sealant: To CAN/CGSB-19.13, Class 40, one-component, cold-applied, non-sagging silicone.

.1 Acceptable material: Dow Corning 795.

.5 Steel reinforcement: to CAN/CSA-G40.21, grade 300 W.

.6 Sheet Aluminum to AA6063-T5 alloy, 2mm thick, bonded to substrate where noted.

2.9 STEEL FINISHES

.1 Finish steel clips and reinforcing steel with zinc coating to CSA G164.

Part 3 Execution

3.1 INSTALLERS

.1 Use only installers with 2 years minimum experience with work similar to work of this Section.

3.2 EXAMINATION

.1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for door installation in accordance with manufacturer’s written instructions.

.1 Visually inspect substrate in presence of Contract Administrator.

.2 Inform Contract Administrator of unacceptable conditions immediately upon discovery.

3.3 INSTALLATION

.1 Set frames plumb, square, level at correct elevation in alignment with adjacent Work.

.2 Anchor securely.

.3 Install doors and hardware in accordance with hardware templates and manufacturer's instructions.

.4 Adjust operable parts for correct function.

.5 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.

3.4 GLAZING

.1 Glaze aluminum doors and frames in accordance with Section 08 80 00 – Glazing.

3.5 CAULKING

.1 Seal joints to provide weather tight seal at outside and air, vapour seal at inside.

.2 Apply sealant in accordance with Section 07 92 00 – Joint Sealers. Conceal sealant within the aluminum Work except where exposed use is permitted by Contract Administrator.

3.6 PROTECTION

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

.2 Repair damage to adjacent materials caused by aluminum door installation.

END OF SECTION

Part 1 General

1.1 WORK INCLUDED

.1 The Work included under this Section shall conform to the industry standard and be accepted by the local construction and trade associations.

.2 Flush wood doors, non-rated.

1.2 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 60 00 – Basic Product Requirements

.3 Section 06 20 00 – Finish Carpentry

.4 Section 08 11 00 – Steel Doors and Frames

.5 Section 08 71 00 – Door Hardware

.6 Section 08 80 00 – Glazing

.7 Section 09 90 00 – Painting

1.3 REFERENCES

.1 AWMAC (Architectural Woodwork Manufacturers' Association of Canada) - Millwork Standards current edition.

.2 American Society for Testing and Materials (ASTM)

.1 ASTM D5456 – Standard Specification for Evaluation of Structural Composite Lumber Products

.3 Architectural Woodwork Institute (AWI) / Architectural Woodwork Manufacturer’s Association of Canada (AWMAC)

.1 AWI/AWMAC – Quality Standards

.4 Canadian Standards Association (CSA) International

.1 CAN/CSA O132.2 Series – Wood Flush Doors

.5 National Fire Protection Association (NFPA)

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

.2 NFPA 252 – Standard Method of Fire Tests of Door Assemblies

.6 Underwriters’ Laboratories (UL)

.1 UL 10B – Standard for Fire Test of Door Assemblies

.7 Warnock Hersey Intertek Testing Services (ITS-WH)

.1 ITS Certification Listings for Fire Doors

.8 Window and Door Manufacturer’s Association (WDMA)

.1 WDMA 1.S.1A

1.4 SUBMITTALS FOR REVIEW

.1 Section 01 33 00: Submission procedures.

.2 Product Data: Indicate door core Materials and construction; veneer species, type and characteristics.

.3 Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, factory machining criteria, identify cutouts for glazing and louvers.

.4 Cut Sheet, Materials safety data sheets, signed attestations or other official literature clearly identifying product emmision rates.

.5 Include elevations indicating veneer requirements including veneer grade, cut, species, piece match, face match, appearance of pairs, sets and transoms and aesthetic grade.

1.5 SAMPLES

.1 For factory finished doors, submit two (2) sets of 200mm x 250mm (8” x 10”) selected veneer samples with the standard finish colours representing manufacturer’s full range of available colours and finishes. Samples shall represent the colour selected on veneer typical of grain patterns and colouration for the specified species and cut selected.

.2 Corner sample: submit 216mm x 279mm (8-1/2” x 11”) corner sample cut away to show stile, rail, crossbanding, core and face veneer with description and date.

.3 Selection samples: for each finish product selected, submit two (2) complete sets of colour chips representing manufacturer’s full range of available colours and patterns.

.4 Verification samples: for each finish product specified, two (2) samples, minimum size 150mm (6”) square, representing actual product, colour and patterns.

1.6 REGULATORY REQUIREMENTS

.1 Conform to applicable code for fire rated doors and panels. All rated doors are to carry the applicable ULC/WH label.

1.7 QUALITY ASSURANCE

.1 Perform Work in accordance with AWI/AWMAC QSI, custom grade.

.2 Manufacturer: Company specializing in manufacturing the Products specified in this Section with a minimum three (3) years documented experience.

.3 Non-fire-rated doors: provide doors that comply with AWI Section 1300 and WDMA 1.S.1A.

.4 Fire-rated doors: provide doors that comply with NFPA 80, NFPA 252, and UL10B, as applicable and as acceptable to authorities having jurisdiction, and that are listed and labeled by ITS-WH or a qualified testing agency. Notify Contract Administrator prior to fabrication if fire doors required cannot qualify for labeling due to design, size, hardware or other requirement.

.5 Single source responsibility: where possible, provide doors from a single source to ensure uniformity in quality of appearance, face veneer, finish and construction.

1.8 DELIVERY, STORAGE, AND HANDLING

.1 Deliver products to Site, and store and protect products, to requirements of Section 01 60 00 – Basic Product Requirements.

.2 Accept products of this Section on Site in new condition and verify no damage.

.3 Protect doors with resilient packaging and sealed with heat shrink plastic.

.4 Break seal on Site to permit ventilation.

.5 Protect doors from dampness. Arrange for delivery after Work causing abnormal humidity has been completed.

.6 Store doors in well ventilated room, off the floor, in accordance with manufacturer's recommendations.

.7 Protect doors with resilient packaging. Do not store in damp or wet areas; or in areas where sunlight might bleach the veneer. Seal top and bottom edges if stored more than one week.

1.9 ENVIRONMENTAL CONDITIONS

.1 Maintain environmental conditions including temperature, humidity and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits. Inspect for damage prior to installation.

1.10 WASTE MANAGEMENT AND DISPOSAL

.1 Remove from Site and dispose of all packaging Materials at appropriate recycling facilities

.2 Dispose of all corrugated cardboard polystyrene plastic packaging Material in appropriate On-Site bin for recycling in accordance with Site waste management program.

1.11 WARRANTY

.1 Provide a five year warranty under provisions of the General Conditions of Construction.

.2 Warranty: Include coverage of warpage beyond installation tolerances indicated in this Section, delamination or degradation of veneer.

Part 2 Products

2.1 FLUSH WOOD INTERIOR DOORS AND FRAMES, RATED AND NON-RATED

.1 Standard of acceptance, doors: Raised single hip white oak, two panel wood door with stile and rail profile matching ovolo sticking single hip raised panel. Refer to Drawings for more information. As distributed by Penner Door and Hardware or approved equivalent in accordance with B7 Substitutions. Veneer, finish and panels intended to match existing doors. Submit samples for approval by Contract Administrator.

.2 Standard of acceptance, frames: Solid white oak, single rabbet to match existing conditions. As distributed by Penner Door and Hardware or approved equivalent in accordance with B7 Substitutions. Submit samples for approval by Contract Administrator.

.3 Finish: Delivered sanded but unfinished. Finish in Contract as per Section 09 90 00 Painting.

.4 Refer to Door Schedule for locations, quantities and sizes and fire ratings.

2.3 ACCESSORIES

.1 Glazing Stops: solid maple with mitered corners; installed with small head countersunk screws.

2.4 FABRICATION

.1 Fabricate non-rated doors in accordance with AWMAC Quality Standards.

.2 Fabricate fire rated doors in accordance with AWMAC Quality Standards and to ULC requirements. Attach fire rating label to door edge.

.3 Provide flush doors with 13 mm thick edge strips of wood species to match face veneer.

.4 Pre-machine doors for finish hardware.

Part 3 Execution

3.1 INSTALLATION

.1 Installation of doors specified in Section 06 10 00 – Rough Carpentry.

END OF SECTION

PART 1 GENERAL

1.1 SECTION INCLUDES

.1 Overhead Coiling Counter Doors, power operated.

1.2 RELATED SECTIONS

.1 Section 06 20 00 - Finish Carpentry: Wood jamb and head trim.

.2 Section 09 90 00 - Painting: Field applied finish.

.3 Division 26 - Electrical

1.3 REFERENCES

.1 ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.2 ASTM A 666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

.3 ASTM A 924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

.4 NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).

.5 NEMA ICS 2 - Industrial Control and Systems: Controllers, Contactors, and Overload Relays, Rated Not More Than 2000 Volts AC or 750 Volts DC.

.6 NEMA MG 1 - Motors and Generators.

.7 NFPA-80 – Standard for Fire Doors and Fire Windows.

1.4 SUBMITTALS

.1 Submit under provisions of Section 01 33 00.

.2 Product Data: Manufacturer's data sheets on each product to be used, including:

.1 Preparation instructions and recommendations.

.2 Storage and handling requirements and recommendations.

.3 Details of construction and fabrication.

.4 Installation methods.

.3 Shop Drawings: Include detailed plans, elevations, details of framing members, required clearances, anchors, and accessories. Include relationship with adjacent construction.

.4 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

.5 Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) long, representing actual product, color, and patterns.

.6 Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

.1 Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five years experience in the fabrication and installation of security closures.

.2 Installer Qualifications: Company specializing in performing Work of this section with minimum three years and approved by manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

.1 Store products in manufacturer's unopened packaging until ready for installation.

.2 Protect materials from exposure to moisture. Do not deliver until after wet work is complete and dry.

.3 Store materials in a dry, warm, ventilated weathertight location.

1.7 PROJECT CONDITIONS

.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.8 COORDINATION

.1 Coordinate Work with other operations and installation of adjacent finish materials to avoid damage to installed materials.

1.9 WARRANTY

.1 Warranty: Manufacturer’s limited door warranty for 2 years for all parts and components.

.2 Manufacturer’s 2 year limited warranty for PowderGuard Premium Powder Coat Finish.

PART 2 Products

2.1 MANUFACTURERS

.1 Acceptable Manufacturer: Overhead Door Corp., 2501 S. State Hwy. 121, Suite 200, Lewisville, TX 75067. ASD. Tel. Toll Free: (800) 275-3290. Phone: (469) 549-7100. Fax: (972) 906-1499. Web Site: www.overheaddoor.com. E-mail: info@overheaddoor.com.

.2 Requests for equals will be considered in accordance with B7 Substitutions.

2.2 OVERHEAD COILING COUNTER FIRE DOORS

.1 Overhead Coiling Counter Fire Doors: Model 640 Counter Fire Doors.

.2 Label: Provide rolling fire doors certified with the following listing:

.1 ULC 1-1/2-Hour Class B Label for installation in non-masonry walls, face mounted or between jambs.

.2 Face-of-wall mounting.

.3 Curtain: Interlocking slats, Type F-158 fabricated of 22 gauge galvanized steel. Endlocks shall be attached to ends of alternate slats to maintain curtain alignment and prevent lateral slat movement.

.4 Finish: polyester powder coat color as selected by the Contract Administrator from Powderguard Premium Colour Chart.

.1 Bottom Bar: Single black powder coated steel angle bottom bar with 1/4 inch (6 mm) foam astragal.

.7 Guides:

.1 Roll-formed black powder coated steel with brush smoke seals.

.2 PowderGuard Weathered finish with iron/black powder.

.3 Fastening Guides to Masonry Fire Walls: ULC listed expansion anchors, or by through-bolts on soft brick or hollow block walls, or by bolts on steel jambs

.8 Brackets: Black powder coated steel steel plate to support counterbalance, curtain and hood.

.9 Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel.

.10 Hood: Provided with intermediate support brackets as required and fabricated of galvanized painted steel.

.11 Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3 foot nor more than 1 foot per second.

.12 Operator Controls: Push-button and key operated control stations with open, close, and stop buttons.

.13 Controls: flush mounted.

.14 Automatic Closure: Release upon input from fire alarm system. Capable of receiving alarm input from two smoke and/or heat detectors.

PART 3 Execution

3.1 EXAMINATION

.1 Verify opening sizes, tolerances and conditions are acceptable.

.2 Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

.3 If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

.1 Install in accordance with manufacturer's instructions.

.2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

.3 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

.4 Fit and align assembly including hardware; level and plumb, to provide smooth operation.

.5 Coordinate installation of electrical service with Division 16. Complete wiring from disconnect to unit components.

.6 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 90 00.

.7 Install perimeter trim and closures.

3.4 ADJUSTING

.1 Test for proper operation and adjust as necessary to provide proper operation without binding or distortion.

.2 Adjust hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

.1 Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

.2 Remove labels and visible markings.

.3 Touch-up, repair or replace damaged products before Substantial Completion.

3.6 PROTECTION

.1 Protect installed products until completion of project.

END OF SECTION

Part 1 General

1.1 SUMMARY OF WORK

.1 This Section specifies thermally broken, stick-built, glazed aluminum curtain wall and accessories.

1.2 RELATED REQUIREMENTS

.1 Section 07 25 00 – Vapour/ Air Barrier Membrane

.2 Section 07 62 00 – Sheet Metal Flashing and Trim

.3 Section 07 84 00 – Firestopping

.4 Section 07 92 00 – Joint Sealing

.5 Section 08 80 00 – Glazing

1.3 REFERENCE STANDARDS

.1 Aluminum Association (AA)

.1 DAF 45 [2003], Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).

.1 AAMA-501-[2005], Methods of Test for Exterior Walls.

.2 AAMA-2603-[2013], Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.3 AAMA-2604-[2013], Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.4 AAMA-2605-[2013], Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.5 AAMA CW DG-1-[96], Aluminum Curtain Wall Design Guide Manual.

.6 AAMA CW-10-[2012], Care and Handling of Architectural Aluminum From Shop to Site.

.7 AAMA CW-11-[1985], Design Windloads for Buildings and Boundary Layer Wind Tunnel Testing.

.8 AAMA-TIR A1-[2004], Sound Control for Fenestration Products.

.3 ASTM International (ASTM).

.1 ASTM A653 / A653M – [09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.2 ASTM B209-[2010], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

.3 ASTM B221-[2013], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.4 ASTM C612 – [2014], Standard Specification for Mineral Fiber Block and Board Thermal Insulation.

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

.6 ASTM E331-[2009], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.7 ASTM E413 – [04], Classification for Rating Sound Insulation.

.8 ASTM E1105 – [2008], Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.

.9 ASTM D2240 – [2010], Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.8-[97], Insulating Glass Units.

.2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.3 CAN/CGSB-19.13-[M87], Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.6 CSA International (CSA)

.1 CAN/CSA-S157-[2005], Strength Design in Aluminum.

.2 CAN/CSA-S136–[2007], North American Specification for the Design of Cold-Formed Steel Structural Members.

.3 CAN/CSA W59.2-[M1991(R2003)], Welded Aluminum Construction.

.7 Environmental Choice Program (ECP)

.1 CCD-45-[1995], Sealants and Caulking Compounds.

.8 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S710.1 [2005], Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: Co-ordinate Work of this Section with Work of other trades for proper time and sequence to avoid construction delays.

.2 Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing Work of this Section to verify project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer's written installation instructions.

.1 Comply with Section 01 31 19 - Project Meetings and co-ordinate with other similar pre-installation meetings.

.2 Notify attendees 2 weeks prior to meeting and ensure meeting attendees include as minimum:

.1 The City;

.2 Contract Administrator;

.3 Glazing subcontractor;

.4 Manufacturer's Technical Representative.

.3 Ensure meeting agenda includes review of methods and procedures related to glazed aluminum curtain wall installation including co-ordination with related Work.

.4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of Work and distribute to each attendee within 1 week of meeting.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Contract Conditions and Section 01 33 00 - Submittal Procedures.

.2 Product Data: Submit product data including manufacturer's literature for glazed aluminum curtain wall extruded members, panels, components and accessories, indicating compliance with specified requirements and Material characteristics.

.1 Submit list on curtain wall manufacturer's letterhead of Materials, components and accessories to be incorporated into Work.

.2 Include product names, types and series numbers.

.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings: Submit Drawings stamped and signed by a professional registered or licensed in the Province of Manitoba, Canada. Include on Shop Drawings:

.1 Curtain wall panel and component 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.

.2 Show size and location of seismic restraints. Include seismic design calculations.

.3 Include details of fasteners between interior and exterior extrusions ensuring no penetration of thermal break or thermal bridging.

.4 Samples:

.1 Submit 300mm (12") long sample aluminum section showing prefinished aluminum surface, finish, colour and texture.

.2 Submit 300mm x 300mm (12" x 12") sample sections of insulating glass unit showing glazing Materials, with coatings and frit, and edge and corner details.

.5 Thermal Performance: Submit verification that Insulating Glass Units used in curtain wall system meet RSI (R) values specified in 2.3.5 of this Specification Section.

.6 Test Reports:

.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.7 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representatives Site visit and inspection.

.8 Installer Qualifications:

.1 Submit letter verifying installer's experience with Work similar to Work of this Section.

1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply maintenance data for curtain wall for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.2 Record Documentation: In accordance with Section 01 78 00 - Closeout Submittals.

.1 List Materials used in curtain wall Work.

.2 Warranty: Submit warranty documents specified.

1.7 QUALITY ASSURANCE

.1 Mock-up: Construct mock-up full height x minimum 3 glazing units wide of vertical glazed aluminum curtain wall using proposed procedures, Materials and quality of Work where directed by Contract Administrator and in accordance with Section 01 45 00 – Quality Control.

.1 Include intermediate mullion, corner detail, sill, insulated glazing units, including upper and lower glass spandrel panels with ceramic frit and insulated back pan.

.2 Assemble to illustrate component assembly including glazing Materials, weep drainage system, attachments, anchors, and perimeter sealant.

.3 Purpose: To judge quality of Work and Material installation.

.4 Allow Contract Administrator 24 hours minimum prior to inspection of mock-up.

.5 Do not proceed with Work prior to receipt of written acceptance of mock-up by Contract Administrator.

.6 When accepted, mock-up will demonstrate minimum standard of quality required for Work of this Section.

.7 Approved mock-up will remain part of finished Work.

1.8 DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver Material in accordance with Section 01 60 00 – Basic Product Requirements.

.2 Deliver glazed aluminum curtain wall Materials and components in manufacturer's original packaging with identification labels intact and in sizes to suit project.

1.9 WARRANTY

.1 Project Warranty: Refer to Contract Conditions for project warranty provisions.

.2 Manufacturer's warranty: Submit, for the City's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to and not intended to limit other rights the City may have under Contract Conditions.

.3 Warranty period: 1 years commencing on Date of Substantial Performance of Work.

.1 Insulating glass units: 10 years, on Date of Substantial Performance of Work.

Part 2 Products

2.1 MANUFACTURER

.1 Manufacturer: Alumicor Limited, 290 Humberline Drive, Toronto, Ontario, Canada M9W 5S2.

2.2 DESCRIPTION

.1 Thermally broken, vertical stick-built glazed aluminum curtain wall system of tubular aluminum sections with self supported framing, shop fabricated, factory prefinished, vision glass, insulated glass spandrel panel with offset backpan, column covers; related flashings, anchorage and attachment devices.

.2 Ensure assembled system design permits re-glazing of individual glass and infill panels from exterior without requiring removal of structural mullions.

2.3 DESIGN CRITERIA

.1 Design curtain wall to AAMA CW-DG-1.

.1 Design glazed aluminum curtain wall following rainscreen principles.

.2 Ensure horizontal members are sealed to vertical members to form individual compartments in accordance with rainscreen principles.

.3 Ventilate and pressure equalize air space outside exterior surface of insulation to exterior.

.2 Design aluminum components to CAN/CSA S157.

.3 Design and size curtain wall components to withstand dead and live loads caused by pressure and suction of wind, acting normal to plane of wall using design pressure of 0.95 kPa (20 psf).

.1 Design curtain wall system for expansion and contraction caused by cycling temperature range of 95 degrees C over 12 hour period without causing detrimental effect to system components.

.2 Thermal expansion: Ensure curtain wall system can withstand temperature differential of 85 degrees C and is able to accommodate interior and exterior system expansion and contraction without damage to components or deterioration of seals.

.3 Design vertical expansion joints with baffled overlaps and compressed resilient air seal laid between mullion ends.

.4 Ensure system is designed to accommodate:

.1 Movement within curtain wall assembly.

.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: refer to Structural

.5 Thermal resistance:

.1 System U-Value: 1.05/m^2K.

.6 Limit mullion deflection to flexure limit of glass 19 mm (0.75 inches) maximum with full recovery of glazing materials.

.7 Deadload prevention: Design curtain wall system with separate, integrated support for insulating glass units.

.8 Sound attenuation through wall system (exterior to interior): STC 33 to AAMA T1R - A1, ASTM E413.

.9 Glass dimensions: Size glass units to CAN/CGSB-12.20.

.10 Flatness criteria: 6 mm (0.25 inches) maximum in 6 m (20 feet) for each panel.

.11 Air infiltration: 0.3 L/s/m^2 (0.63 cfm) maximum of wall area at differential pressure across assembly of 300 Pa (0.044 psi).

.12 Water infiltration: None at differential pressure across assembly of 720 Pa (0.104 psi).

.13 Ensure interior surfaces have no condensation before exposed edges of sealed units reach dew point temperatures during testing to AAMA 501.

.14 Maintain continuous air barrier and vapour retarder throughout building envelope and curtain wall assembly.

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

.16 Reinforce curtain wall system to accommodate window washing guide rails where indicated.

2.4 MATERIALS

.1 Curtain Wall System and Components:

.1 Extruded aluminum: To ASTM B221, 6063 alloy with T5 temper.

.1 Finish coatings: To AA DAF 45 Architectural Class I, black anodized 18 µm (0.0007 inches) thick minimum.

.2 Sheet aluminum: To ASTM B209, utility grade for unexposed surfaces.

.3 Air barrier liner: Reinforce panels to maintain flat surface.

.1 Concealed locations: [0.952 mm (20 gauge) steel sheet with 458 g/m^2 (1.25 oz/sq.ft) galvanized coating and corners sealed at concealed locations.

.2 Interior exposed locations: 1.588 mm (16 gauge) black anodized aluminum sheet.

.4 Fasteners, screws and bolts: Tamperproof, cadmium plated stainless steel series suitable to meet curtain wall requirements and as recommended by manufacturer.

.5 Anchors: Ensure anchors have three-way adjustment.

.8 Insulated Back Pan: 5” offset inner flange, insulated back pan as indicated on Drawings. Standard of Acceptance: Envatherm Curtain Wall Back Pans by Lenmak.

.9 Thermal Break: Glass fibre reinforced polyamide porthole extrusion.

.2 Acceptable Material: Alumicor Ltd., ThermaWall 2600 Series.

2.5 CURTAIN WALL SYSTEM FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.

.1 Ensure vertical and horizontal members are tubular extrusions designed for shear block corner construction.

.2 Mullion depth size: 168 mm (6 5/8”)

.4 Structural silicone joints where indicated on Drawings.

.5 Ensure caps for mullion assemblies are constructed without gap.

.3 Construct units square, plumb and free from distortion, waves, twists, buckles or other defects detrimental to performance or appearance.

.1 Ensure curtain wall is fabricated with separate, integrated support for insulating glass unit.

.2 Do glazing in accordance with Section 08 80 00 – Glazing.

.3 Site glazing is permitted.

.4 Fabricate curtain wall with minimum clearances and shim spacing around panel perimeter and ensure installation and dynamic movement of perimeter seal is enabled.

.6 Accurately fit and secure joints and corners.

.1 Ensure joints are flush, hairline, and weatherproof.

.7 Prepare curtain wall to receive anchor devices.

.8 Use only concealed fasteners

.1 Ensure fasteners do not penetrate thermal break.

.2 Where fasteners cannot be concealed, countersunk screws finished to match adjacent Material may be used upon receipt of written approval from Contract Administrator.

.9 Prepare components to receive doors and openings as indicated.

.10 Reinforce head rail of interior components to receive track brackets and attachments as indicated.

.11 Reinforce framing members for exterior imposed loads where required.

.12 Visible manufacturer’s labels are not permitted.

2.6 FINISHES

.1 Exterior exposed aluminum surfaces: To AA DAF-45-M12C22A44. Architectural Class I, black anodized 18 µm (0.0007 inches)] minimum thickness.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

.2 Interior exposed aluminum surfaces: To AA DAF-45-M12C22. Architectural Class I, black anodized 18 µm (0.0007 inches)] minimum thickness.

.1 Acceptable Material: Alumicor Ltd., Class I Anodic Finish.

2.7 ACCESSORIES

.1 Insulation: In accordance with Section 07 21 00 – Thermal Insulation.

.3 Gasketing: To CCD-45 Silicone compatible rubber or extruded silicone gaskets.

.4 Setting Blocks: To CCD-45 and ASTM D2240, silicone, 80 - 90 Shore A Durometer hardness.

.5 Spacers: To CCD-45 and ASTM D2240, silicone, 50 - 60 Shore A Durometer hardness.

.6 Sealant: To CAN/CGSB-19.13, Class 40, one-component, cold-applied, non-sagging silicone.

.1 Acceptable Material: Dow Corning 795.

.7 Sealant Bond Breaker: Open cell foam backer rod sized to suit project requirements.

.8 Flashings: 3 mm (0.125 inches) thick aluminum flashing to profiles indicated and in accordance with Section 07 62 00 - Sheet Metal Flashing and Trim.

.9 Liquid Foam Insulation: Single component, moisture cure, low expansion rate spray-in-place polyurethane liquid foam insulation to ULC-S710.1 and in accordance with manufacturer's written recommendations.

.10 Miscellaneous Components: Covers, copings, special flashings, filler pieces, termination pieces, cap closures, expansion joint covers, and metal bellows to match curtain wall system as indicated.

Part 3 Execution

3.1 INSTALLERS

.1 Use only installers with 2 years minimum experience in Work similar to Work of this Section.

3.2 EXAMINATION

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

.1 Visually inspect substrate in presence of Contract Administrator.

.2 Inform Contract Administrator 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 Contract Administrator.

3.3 INSTALLATION

.1 Install curtain wall in accordance with manufacturer's written instructions in accordance with Drawings.

.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 Install thermal isolation where components penetrate or disrupt building insulation.

.5 Install sill flashings.

.6 Co-ordinate installation of fire stop insulation, in accordance with Section 07 84 00 - Firestopping, at each floor slab edge and intersection with vertical construction where indicated.

.7 Install smoke sealing where indicated.

.8 Co-ordinate attachment and seal of perimeter air barrier in accordance with Section 07 25 00 – Air/Vapour Barrier Membrane.

.9 Install fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.10 Install insulating glass units and infill panels in accordance with Section 08 80 00 - Glazing and to manufacturer's written instructions.

.11 Install perimeter sealant to method required to achieve performance criteria, backing Materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealers.

3.4 FIELD QUALITY CONTROL

.1 Field Inspection: Coordinate field inspection in accordance with Section 01 45 00 - Quality Control.

.2 Site Installation Tolerances:

.1 Variation from plumb: 12 mm per 30 m (0.5 inches per 100 feet) maximum.

.2 Misalignment of two adjacent panels or members: 0.8 mm (0.03 inches) maximum.

.3 Sealant space between curtain wall and adjacent construction: 13 mm (0.5 inches) maximum.

.3 Manufacturer's Services:

.1 Coordinate manufacturer's services with Section 01 45 00 - Quality Control.

.2 Submit to Contract Administrator a written agreement from the manufacturer to perform the manufacturer's services.

.3 Schedule manufacturer's review of Work procedures at stages listed:

1. Product Application.
2. Fabrication and Handling.
3. Installation.

.4 Submit manufacturer's written reports to Contract Administrator describing:

.1 The scope of Work requested.

.2 Date, time and location.

.3 Procedures performed.

.4 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.

.5 Limitations or disclaimers regarding the procedures performed.

.6 Obtain reports within seven days of review and submit immediately to Contract Administrator.

3.5 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

Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 45 00 – Quality Control

.3 Section 01 60 00 – Basic Product Requirements

.4 Section 01 78 00 – Closeout Submittals

.5 Section 06 10 00 – Rough Carpentry

.6 Section 06 20 00 – Finish Carpentry

.7 Section 08 11 00 – Steel Doors and Frames

.8 Section 08 11 16 – Aluminum Doors and Frames

.9 Section 08 14 00 – Wood Doors

.10 Section 14 42 16 – Vertical Wheelchair Lift

.11 Electrical Specifications

1.2 REFERENCES

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

.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

.2 Canadian General Standards Board (CGSB).

.2 CAN/CGSB-69.17-M86(R1993), Bored and Preassembled Locks and Latches or latest.

.3 CAN/CGSB-69.18-M90ANSI/BHMA A156.1-1981, Butts and Hinges or latest.

.4 CAN/CGSB-69.19-93ANSI/BHMA A156.3-1984, Exit Devices or latest.

.5 CAN/CGSB-69.20-M90/ANSI/BHMA A156.4-1986 Door Controls (Closers) or latest.

.6 CAN/CGSB-69.21-M90/ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products or latest.

.7 CAN/CGSB-69.22-M90/ANSI/BHMA A156.6-1986, Architectural Door Trim or latest.

.8 CAN/CGSB-69.24-M90/ANSI/BHMA A156.8-1982, Door Controls - Overhead Holders or latest.

.9 CAN/CGSB-69.26-96/ANSI/BHMA A156.10-1991, Power-operated Pedestrian Doors or latest.

.10 CAN/CGSB-69.28-M90/ANSI/BHMA A156.12-1986, Interconnected Locks and Latches or latest.

.11 CAN/CGSB-69.29-93/ANSI/BHMA A156.13-1987, Mortise Locks and Latches or latest.

.12 CAN/CGSB-69.30-93/ANSI/BHMA A156.14-1991, Sliding and Folding Door Hardware or latest.

.13 CAN/CGSB-69.31-M89/ANSI/BHMA A156.15-1981, Closer/Holder Release Device or latest.

.14 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware or latest.

□

.15 CAN/CGSB-69.33-M90/ANSI/BHMA A156.17-1987, Self-closing Hinges and Pivots or latest.

.16 CAN/CGSB-69.34-93/ANSI/BHMA A156.18-1987, Materials and Finishes or latest.

.17 CAN/CGSB-69.35-M89/ANSI/BHMA A156.19-1984, Power Assist and Low Energy Power Operated Doors or latest.

.18 CAN/CGSB-69.36-M90]ANSI/BHMA A156.20-1984, Strap and Tee Hinges and Hasps or latest.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, Specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Samples:

.1 Submit one of each unique piece of hardware for review by Contract Administrator. For hinges, one hinge is acceptable in lieu of a full set. For kickplates and other items with varying dimensions, one 50mm x 50mm sample showing finish and fasteners is acceptable in lieu of full size. Send in accordance with Section 01 33 00 - Submittal Procedures.

.3 Hardware List:

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

.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 specified in Section 01 78 00 - Closeout Submittals.

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

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

.4 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.5 Warranties: Provide a 1 year warranty as provided in General Conditions for Construction for all hardware and associated component supplied under this

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Section, except for the Automatic door operators and their related components shall have a 2 year warranty (including the motor and the operating unit).

1.5 DELIVERY, STORAGE, AND HANDLING

.1 Packing, Shipping, Handling and Unloading:

.2 Deliver, store, handle and protect Materials in accordance with Section 01 60 00 - Basic Product Requirements.

.3 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

.4 Storage and Protection:

.1 Store finishing hardware in locked, clean and dry area.

1.6 WASTE DISPOSAL AND MANAGEMENT

.1 Remove from Site and dispose of packaging Materials at appropriate recycling facilities.

.2 Dispose of corrugated cardboard, polystyrene, plastic packaging Material in appropriate on-site bin for recycling in accordance with Site waste management program.

1.7 MAINTENANCE

.1 Extra Materials:

.1 Provide maintenance Materials in accordance with Section 01 78 00 - Closeout Submittals.

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

Part 2 Products

2.1 HARDWARE ITEMS

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

.2 Manufacturer’s listed in the door hardware schedule should be taken as the Standard of Acceptance.

2.2 DOOR HARDWARE (also refer to Hardware Schedule below)

.1 Locks and latches:

.1 Bored and preassembled locks and latches: to CAN/CGSB-69.17 or latest, with lever handles as stated in Hardware Schedule. Acceptable manufacturer is Best Access Systems.

.2 All locksets/latchsets with levers to have 70mm backset typically.

.3 All locksets/latchsets with knobs to have 127mm backset typically.

.2 Butts and hinges:

.1 Butts and hinges: to CAN/CGSB-69.18 or latest, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

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.2 Self-closing hinges and pivots: to CAN/CGSB-69.33 or latest, designated by letter K and numeral identifiers listed in Hardware Schedule, [with suffix letter F indicating listed for used on fire doors].

.3 Strap and tee hinges and hasps: to CAN/CGSB-69.36 or latest, designated by letter A and numeral identifiers listed in Hardware Schedule, size [listed in Hardware Schedule] [in accordance with CAN/CGSB 69.36 or latest, table I].

.4 Provide 1 ½ pair of butts for door up to 914mm (36") wide x 2200mm (84") high and 2 pairs of butts for doors larger than these dimensions.

.3 Exit devices: to CAN/CGSB 69.19 or latest, as listed in Hardware Schedule.

.4 Auxiliary item(s): door co-ordinator, type 21, for pairs of doors with overlapping astragals.

.5 Door Closers and Accessories:

.1 Door controls (closers): to CAN/CGSB-69.20 or latest, designated by letter C and numeral identifiers listed in Hardware Schedule, in accordance with CAN/CGSB-69.20, table A1..2 Door controls - overhead holders: to CAN/CGSB-69.24 or latest, designated by letter C and numeral identifiers listed in Hardware Schedule.

.3 Closer/holder release devices: to CAN/CGSB-69.31 or latest, designated by letter C and numeral identifiers listed in hardware schedule.

.4 Door co-ordinator: for pairs of doors with overlapping astragal.

.6 Door Operators:

.1 Power-operated pedestrian doors: to CAN/CGSB-69.26 or latest.

.2 Power assist and low energy power operated doors: to CAN/CGSB-69.35 or latest.

.7 Architectural door trim: to CAN/CGSB-69.22 or latest, designated by letter J and numeral identifiers as listed in Hardware Schedule.

.1 Door protection plates: kick plate on push side of door unless otherwise noted, 1.27 mm thick aluminum or stainless steel, with countersunk oval head stainless steel screws. Length to be full width of door less 50mm (2").

.2 Push plates: 1.27 mm thick stainless steel.

.3 Push/Pull units: stainless steel.

.4 Acoustic sound seals and door bottom seal: heavy duty, surface mounted, seals of extruded aluminum frame (clear anod. finish) and solid closed cell neoprene seal. Door bottom to have adjustable automatic retract mechanism when door is open.

.5 Thresholds: width listed x full width of door opening, extruded aluminum mill finish, serrated surface, with thermal break of rigid PVC and minimal lip to permit barrier free access.

.8 Weatherstripping:

.1 Head and jamb seal:

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

.2 Adhesive backed neoprene Material.

.2 Door bottom seal:

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

.2 Astragal: adjustable extruded aluminum frame with pile insert, finished to match doors.

.9 Barrier Free Electric Door Operator: (also refer to Hardware Schedule)

.1 Heavy duty electric automatic door closer, capable of multi-door operation, complete with actuators, and control boxes, clear anodized aluminum finish. Surface mounted type with provision for adjustment of operative speed.

.2 Control boxes: complete with electric strike relay.

.3 Electrical box and actuator: Hardwired low voltage actuator with stainless steel plate, engraved blue filled with handicap symbol. Confirm final locations on Site for Contract Administrator approval.

.4 Key switch control (on/off/hold open) shall be provided on each handicap operator (option to hold door open, option to keep door closed).

.5 Provide switched line voltage to control box. Locate bypass switch above housing mechanism and wire so switch will also act as an on-off switch for the door operator.

.6 Housing for door operators to extend across full door width. For manual doors, provide heavy duty closers behind the housing.

.7 Provide low voltage wiring to each actuator.

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.

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2.4 HARDWARE SCHEDULE

Set: 1.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Passage Set	7915 LE1RAW	630	SA
1	Door Closer	1431 UO	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO

Set: 2.0

4	Hinge	TA2314 NRP 4-1/2" x 4"	US32D	MK
1	Storeroom Lock	7904 LE1RAW	630	SA
1	Conc Overhead Stop	6-X36	630	RF
1	Door Closer	1431 UO	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Threshold	171A		PE
1	Sweep	315CN		PE
1	Gasketing	2891AS		PE

Set: 3.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Storeroom Lock	7904 LE1RAW	630	SA
1	Door Closer	1431 UO	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Door Stop	441H	US26D	RO
1	Threshold	271A		PE

Set: 4.0

3	Hinge	TA2714 NRP 4-1/2" x 4"	US26D	MK
1	Classroom Lock	7937 LE1RAW	630	SA
1	Door Closer	1431 PS	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Threshold	271A		PE

Set: 5.0

3	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Indicator Deadbolt	D292	626	YA
1	Push Plate	70C-RKW	US32D	RO
1	Pull Plate	107x70C	US32D	RO
1	Automatic Operator	5710	689	NO
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO
2	Full Height Actuator	639		NO
1	Monitor	LMS-1		SU

Notes: Wire actuators through the latch monitor. Actuators to be disabled when deadbolt is thrown.

Set: 6.0

3	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Storeroom Lock	7904 LE1RAW	630	SA
1	Door Closer	1431 UO	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Door Stop	441H	US26D	RO

Set: 7.0

3	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Privacy Set	7965 LE1RAW	630	SA
1	Door Closer	1431 PS	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Threshold	271A		PE

Set: 8.0

3	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Classroom Lock	7937 LE1RAW	630	SA
1	Door Closer	1431 UO	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO

Set: 9.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Indicator Deadbolt	D292	626	YA
1	Push Plate	70C-RKW	US32D	RO
1	Pull Plate	107x70C	US32D	RO
1	Automatic Operator	5710	689	NO
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO
2	Full Height Actuator	639		NO
1	Monitor	LMS-1		SU

Notes: Wire actuators through the latch monitor. Actuators to be disabled when deadbolt is thrown.

Set: 10.0

3	Hinge	TA2714 NRP 4-1/2" x 4"	US26D	MK
1	Classroom Lock	7937 LE1RAW	630	SA
1	Electro-Mechanical Closer	351 EHT-Push	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Door Stop	441H	US26D	RO
1	Power Supply	BPS-24-1		SU

Notes: Power supply for use with hold open closer. Power supply has built in fire interface (connect to fire alarm system). On alarm power to hold open closers is to be cut off.

Set: 11.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Storeroom Lock	7904 LE1RAW	630	SA
1	Door Stop	441H	US26D	RO

Set: 12.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Classroom Lock	7937 LE1RAW	630	SA
1	Conc Overhead Stop	6-X36	630	RF
1	Kick Plate	K1050 10"	US32D	RO
1	Threshold	271A		PE

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Set: 13.0

5	Hinge (heavy weight)	T4A3386 RT NRP 4-1/2" x 4-1/2"	US26D	MK
1	Hinge (heavy weight)	T4A3386 RT QC12 NRP 4-1/2" x 4-1/2"	US26D	MK
1	Surface Vert Rod Exit	16 8710	US32D	SA
1	Surface Vert Rod Exit	16 56 8762 Less Pull	US32D	SA
2	Door Pull	RM3331-72 Mtg-Type 12XHD MP	US32D	RO
1	Door Closer	351 CPS	EN	SA
1	Door Operator	6060	689	NO
2	Kick Plate	K1050 10"	US32D	RO
1	Threshold	171A		PE
2	Sweep	315CN		PE
1	Gasketing	2891AS		PE
1	Astragal	351C/CP		PE
1	ElectroLynx Harness	QC-C1500P		MK
1	ElectroLynx Harness	QC-C012		MK
2	Full Height Actuator	639		NO
1	Card Reader	By Others		
1	Power Supply	BPS-24-1		SU

Notes: Outside actuator only active when door is unlocked. When unlocked pushing outside actuator will power open the door. Inside actuator will always power open the door.

Set: 14.0

6	Hinge (heavy weight)	T4A3786 RT 4-1/2" x 4-1/2"	US26D	MK
2	Back to Back Door Pull Set	RM3331-72 Mtg-Type 11XHD MP	US32D	RO
2	Electro-Mechanical Closer	351 EHT-Push	EN	SA
2	Kick Plate	K1050 10"	US32D	RO
1	Threshold	271A		PE
1	Power Supply	BPS-24-1		SU

Notes: Power supply for use with hold open closer. Power supply has built in fire interface (connect to fire alarm system). On alarm power to hold open closers is to be cut off.

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Set: 15.0

4	Hinge	TA2314 NRP 4-1/2" x 4"	US32D	MK
1	Deadlatch	4900	628	AD
1	Paddle Operator	4591 Series	628	AD
1	Cylinder	41 x Cam to Suit	US32D	SA
1	Push Bar & Pull	BF15847	US32D	RO
1	Conc Overhead Stop	6-X36	630	RF
1	Door Closer	1431 OZ	EN	SA
1	Mounting Plate	1431B	EN	SA
1	Threshold	171A		PE
1	Weatherstrip and Sweep	By Door Supplier		

Set: 16.0

Single D-101B, 3' 4" x 7' 0" x 1 3/4", LHR
Single D-111, 3' 4" x 7' 0" x 1 3/4", LHR

1	Smoke Seal. 36” Door Bottom	420APKL36	Alum.	PE
3	Pivot, Weld On, Heat Barrier	907669	To Match	Frame
1	Automatic Operator	4630/4640	689	LCN
2	Full Height Actuator	639		NO
1	Strike, Flush Mount, for Rim Exit	D2-006SS	SS	Dorma
1	Concealed Power Transfer, Flex Tube	EPTL	625	SEC
1	Exit Device, Rim	F9700BB LHR 630 MLR	630	Dorma
1	Power Supply, 1 Amp	PS610RF		Dorma
1	Closer, Pull Side Mount	TS9315 T /PULL/	689	Dorma
1	Trim, Tubular Lever, 08 Function w/Cylinder	ZT08 EXT3	630	Dorma

Set: 17.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Indicator Deadbolt	D292	626	YA
1	Push Plate	70C-RKW	US32D	RO
1	Pull Plate	107x70C	US32D	RO
1	Conc Overhead Stop	2-X36	630	RF
1	Automatic Operator	5730	689	NO
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO
2	Full Height Actuator	639		NO
1	Monitor	LMS-1		SU

Notes: Wire actuators through the latch monitor. Actuators to be disabled when deadbolt is thrown.

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Set: 18.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Classroom Lock	7937 LE1RAW	630	SA
1	Wall Stop	406	US32D	RO

Set: 19.0

All Hardware by Lift Supplier

Set: 20.0

3	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Storeroom Lock	7904 LE1RAW	630	SA
1	Door Closer	1431 PS	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Door Stop	441H	US26D	RO

Set: 21.0

3	Hinge	TA2714 NRP 4-1/2" x 4"	US26D	MK
1	Classroom Lock	7937 LE1RAW	630	SA
1	Door Closer	1431 PS	EN	SA
1	Kick Plate	K1050 10"	US32D	RO

Set: 22.0

3	Hinge	TA2714 NRP 4-1/2" x 4"	US26D	MK
1	Storeroom Lock	7904 LE1RAW	630	SA
1	Door Closer	1431 UO	EN	SA
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO

Set: 23.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Push Bar & Pull	BF15847	US32D	RO
1	Conc Overhead Stop	6-X36	630	RF
1	Door Closer	1431 OZ	EN	SA
1	Mounting Plate	1431B	EN	SA
1	Threshold	271A		PE
1	Weatherstrip and Sweep	By Door Supplier		

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Set: 24.0

4	Hinge	TA2714 4-1/2" x 4"	US26D	MK
1	Passage Set	7915 LE1RAW	630	SA
1	Electric Strike	1500C	630	HS
1	Automatic Operator	5710	689	NO
1	Kick Plate	K1050 10"	US32D	RO
1	Wall Stop	406	US32D	RO
2	Full Height Actuator	639		NO

Notes: Pushing actuator on either side of door will release the electric strike and power open the door. Electric strike powered by the auto operator's on board power supply.

2.5 KEYING

.1 Keying shall be under new Grand Master Key System under an existing as supplied by the Best Lock Company.

.2 Supply three (3) keys for each independent core and each independent group. Supply (3) Grand Master Keys.

.3 Lock cylinders shall accommodate removable 7-pin cores.

.4 Hardware supplier shall furnish required number of temporary construction cores and keys to Contractor for security purposes during construction.

.5 All keys to be stamped “Do Not Duplicate”

.6 Contractors shall maintain strict control over construction core and keys.

Part 3 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.

.2 Furnish wood and metal door and frame manufacturers with complete instructions and templates for preparation of their Work to receive hardware.

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

3.2 INSTALLATION

.1 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.

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

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.3 Furnish metal/wood door and frame manufacturers with complete instructions and templates for preparation of their Work to receive hardware.

.4 Furnish manufacturer's instructions for proper installation of each hardware component.

.5 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.6 Mounting heights: unless noted otherwise, use the following heights as a general guideline from the T/O of the finished floor to the C/L (centre line) of the item:

.1 Door Pull - 1070mm

.2 Door Bar - 915

.3 Push Plate – 1400mm

.4 Lockset/Latchset - 915mm

.5 Panic Hardware - 1010mm or as recommended by manufacturer

.6 Deadlock – 1525mm

3.3 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.

3.4 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 and provide written certification to the Contract Administrator that all hardware has been installed as specified.

END OF SECTION

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Part 1 General

1.1 RELATED SECTIONS

.1 Section 01 33 00 – Submittal Procedures

.2 Section 01 45 00 – Quality Control

.3 Section 01 78 00 – Closeout Submittals

.4 Section 08 11 00 – Steel Doors and Frames

.5 Section 08 11 16 – Aluminum Doors and Frames

.6 Section 08 14 00 – Wood Doors

.7 Section 08 44 13 – Glazed Aluminum Curtain Walls

.8 Section 10 99 90 – Miscellaneous Specialties

1.2 REFERENCES

.1 American National Standards Institute (ANSI).

.1 ANSI/ASTM E330-02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference. or latest.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM C542-94(1999), Specification for Lock-Strip Gaskets or latest.

.2 ASTM D790-02, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials or latest.

.3 ASTM D1003-00, Test Method for Haze and Luminous Transmittance of Plastics or latest.

.4 ASTM D1929-96(R2001)e1, Test Method for Determining Ignition Temperature of Plastics or latest.

.5 ASTM D2240-02b, Test Method for Rubber Property - Durometer Hardness or latest.

.6 ASTM E84-01, Test Method for Surface Burning Characteristics of Building Materials or latest.

.7 ASTM F1233-98, Test Method for Security Glazing Materials and Systems or latest.

.3 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass or latest.

.2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass or latest.

.3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass or latest.

.4 CAN/CGSB-12.4-M91, Heat Absorbing Glass or latest.

.5 CAN/CGSB-12.5-M86, Mirrors, Silvered or latest.

.6 CAN/CGSB-12.6-M91, Transparent (One-Way) Mirrors or latest.

.7 CAN/CGSB-12.8-97, Insulating Glass Units or latest.

.8 CAN/CGSB-12.9-M91, Spandrel Glass or latest.

.9 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting or latest.

.10 CAN/CGSB-12.11-M90, Wired Safety Glass or latest.

.11 CAN/CGSB-12.12-M90, Plastic Safety Glazing or latest.

.12 CAN/CGSB-12.13-M91, Patterned Glass or latest.

.4 Canadian Standards Association (CSA International).

.1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors or latest.

.2 CSA Certification Program for Windows and Doors 2000 or latest.

.5 Environmental Choice Program (ECP).

.1 CCD-045-95, Sealants and Caulking or latest.

.6 Flat Glass Manufacturers Association (FGMA).

.1 FGMA Glazing Manual – 1997 or latest.

.7 Laminators Safety Glass Association (LSGA).

.1 LSGA Laminated Glass Design Guide 2000 or latest.

.8 Canadian Insulated Glass Manufacturers Association (CIGMA)

.1 IGCC/IGMA Certification Program for the Harmonized Insulating Glass Standard (ASTM E2190)

1.3 SYSTEM DESCRIPTION

.1 Performance Requirements:

.1 Provide 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 as measured in accordance with ANSI/ASTM E330 or latest.

.3 Limit glass deflection to flexural limit of glass with full recovery of glazing Materials.

1.4 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, Specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit Shop Drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Upon request, submit samples in accordance with Section 01 33 00 - Submittal Procedures.

.4 Submit manufacturer's installation instructions.

.5 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

.6 The window manufacturer must submit a copy of a computer simulation report giving the overall U-value of the standard ASTM test size for each window type used on the project (i.e. fixed, casement, awning, slider). Only reports signed and certified by and independent CWDMA approved Simulation Organizations, and Simulators prepared in accordance with CSA standards A440.2 (latest edition) will be accepted. The report to be submitted with Shop Drawings.

1.5 QUALITY ASSURANCE

.1 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties. Conform to IGMAC – Quality Standard Specification and Glazing Recommendations for Sealed Insulated Glass Units for glazing installation methods.

.1 Provide testing and analysis of glass under provisions of Section 01 45 00 - Quality Control.

.2 Provide shop inspection and testing for glass.

.3 Window supplier must supply either a test report by an independent technical source tested to CSA A440.2 (1998 to current) or a current NFRC Certified Products Listing.

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

.5 Pre-installation Meetings: conduct pre-installation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements.

.6 Warranty: Provide a five year warranty to include coverage of all sealed glass units from seal failure, interpane dusting/misting, and replacement to same quality.

1.6 SITE CONDITIONS

.1 Environmental Requirements:

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

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

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Divert metal cut-offs from landfill by disposal into On-Site Metal recycling bin.

.2 Divert unused caulking and sealant Materials from landfill through disposal at special wastes depot.

.3 Unused or damaged glazing Materials are not recyclable and must not be diverted to municipal recycling programs.

.4 Remove form Site and dispose of packaging Materials at appropriate recycling facilities.

.5 Dispose of corrugated cardboard, polystyrene, plastic packaging Material in appropriate On-Site bin for recycling in accordance with Site waste management program.

Part 2 Products

2.1 MATERIALS: FLAT GLASS

.1 Type A: Float Glass for interior units: to CAN2-12.3.M; glazing quality, thickness to suit opening size thickness and shall be in accordance with applicable Building Code, clear, visible light transmission 88% minimum.

.2 Type B: Safety Glass for interior and exterior units: to CAN2-12.1M; Type 2-Tempered, Glass B-Float, thickness to suit opening size thickness and shall be in accordance with applicable Building Code. Clear. Note: **All exterior outer panes on all glass units are to be tempered.**

.3 Type C: Float Glass for exterior units: CAN2-12.3M; glazing quality, thickness to suit opening size thickness and shall be in accordance with applicable Building Code, visible light transmission 91%, approved product PPG Starphire or approved equal.

.4 Type E: Silvered Mirrored Glass: to CAN/CGSB - 12.5, 6mm thick, Type 1A-float glass for normal use.

2.2 MATERIALS: HERMETICALLY SEALED INSULATING GLASS UNITS (GU)

.1 **Type 1: Insulated Glass Units** at **entrances**: CAN2-12.8M or latest; dual pane, outer pane of Type B safety glass, inner pane of Type B safety glass, thickness to suit opening size and thickness shall be in accordance with applicable Building Code. Interpane space of a full 13mm, purged dry and hermetically sealed, (25mm) insulating glass units with warm edge spacer (Super Spacer, XL bar, or Vilda V-92 bar) with R-value of 4.2 (cog) and SHGC of 0.52.

.2 **Type 2: Insulated Glass Units**: to CAN/CGSB-12.8, triple pane, 50mm overall thickness.

.1 Glass: to CAN/CGSB-12.3, CAN/CGSB-12.1, CAN/CGSB-12.2, CAN/CGSB-12.4 and CAN/CGSB-12.10 or latest.

.2 Glass thickness:

.1 Outer lite: 6mm (0.25”) tempered glass with low-E coating on **surface #2**.

.2 Centre lite: 3mm (0.11”) heat strengthened clear float glass with low-E coating on **surface #4**

.3 Inner lite: 6 mm (0.25”) tempered glass.

.3 Inter-cavity space thickness: 13mm typical between inner and outer lights with warm edge, low conductivity, no-metal spacer. Super Spacer or approved equal in accordance with B7.

.4 Glass coatings:

.1 Low-E coating: SunGuard SN 68.

.2 Ceramic frit: where shown on Drawings, on **surface #5.**

.5 Inert gas fill: 90% argon.

.6 Transmittance:

.1 Visible: 53%

.2 Solar: 22%

.7 Shading co-efficient: 0.80 metric (0.29 imperial) SHGC or lower (centre of glass)

.8 U-Factor: 0.68W/m^2K (centre of glass)

2.3 CERAMIC FRIT ENAMELED GLASS

.1 Material: provide baked-on ferro ceramic frit to pattern shown on Drawings.

.2 Acceptable manufacturers: AGC Glass, Vitrum Industries Ltd., Garibaldi Glass.

.3 Glass with ceramic frit to meet ASTM C 1048 and ANSI 291.1 for tempered glass.

.4 Ceramic Frit Colour: White

2.4 ACCESSORIES

.1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240 or latest, to suit glazing method, glass lightweight and area.

.2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240 or latest, 75mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face. Continuous bond breaker type, and compatible with silicone sealant, “Thermabond V-2100” by Norton or acceptable “as Equal”.

.3 Seals: extruded elastomeric gaskets, compatible with structural silicone sealant, as recommended by the sealant manufacturer, to the interior, and dense EPDM gaskets to the exterior. Glazing tapes are not acceptable.

.4 Glazing tape:

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

.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.

.5 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot.

.6 Glazing clips: manufacturer's standard type.

.7 Lock-strip gaskets: to ASTM C542 or latest.

Part 3 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.

3.2 EXAMINATION

.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.

3.3 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.

3.4 INSTALLATION: EXTERIOR

.1 Perform Work in accordance with IGMAC for glazing installation methods.

.2 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.

.3 Install removable stops without displacing glazing tape/spline. Exert pressure for full continuous contact.

.4 Trim protruding tape edge.

.5 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 9mm below sight line.

.6 Apply cap head of sealant along void between stop and glazing, to uniform line, flush with sight line. Tool or wipe sealant surface smooth.

3.5 INSTALLATION: INTERIOR

.1 Perform Work in accordance with IGMAC for glazing installation methods.

.2 Cut glazing tape to length and set against permanent stops, projecting 1.6mm above sight line.

.3 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.

.4 Place glazing tape on free perimeter of glazing in same manner described.

.5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.

.6 Knife trim protruding tape.

3.6 INSTALLATION: MIRROR

.1 Install mirrors using glazing tape strips vertically at 400mm o.c.

.2 Apply bead of silicone caulking 50mm from edge around perimeter of mirror and vertically between glazing tape strips prior to setting in mirror in place.

3.7 CLEANING

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

.2 Remove traces of primer, caulking.

.3 Remove glazing Materials from finish surfaces.

.4 Remove labels after Work is complete.

.5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacture's instructions.

.6 Upon completion of installation, remove surplus Materials, rubbish, tools and equipment barriers.

3.8 PROTECTION OF FINISHED WORK

.1 After installation, mark light with an "X" by using removable plastic tape or paste. Do not mark heat absorbing or reflective glass units.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

.1 Section Includes:

.1 Fire-rated glazing Materials installed in interior fire-rated wall applications.

1.2 RELATED SECTIONS

.1 Section 08 11 16 – Aluminium Doors and Frames

.2 Section 07 84 00 – Firestopping

.3 Section 07 92 00 – Joint Sealing

.4 Section 08 71 00 – Door Hardware

1.3 REFERENCES

.1 Architectural Manufacturers Association (AAMA)

.1 AAMA 2603-2002 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.

.2 AAMA 2604-2005 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

.3 AAMA 2605-2005 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

.2 American Society for Testing and Materials (ASTM):

.1 Fire safety related:

.1 ASTM E 119: Fire Tests of Building Construction and Materials.

.3 Material related:

.1 ASTM A 1008/A 1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength, Low Alloy, and High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2007.

.2 ASTM A 1011/A 1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2006b.

.4 Sound related:

.1 ASTM E 90-04: Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

.2 ASTM E 413-04: Standard Classification for Rating Sound Insulation

.5 American Welding Society

.1 AWS D1.3 - Structural Welding Code - Sheet Steel; 2007

.6 Builders Hardware Manufacturers Association, Inc.

.7 BHMA A156 - American National Standards for door hardware; 2006 (ANSI/BHMA A156).

.8 American National Standards Institute (ANSI):

.1 ANSI Z97.1: Standard for Safety Glazing Materials Used in Buildings

.9 Consumer Product Safety Commission (CPSC):

.1 CPSC 16 CFR 1201: Safety Standard for Architectural Glazing Materials

.10 Glass Association of North America (GANA):

.1 GANA – Glazing Manual.

.2 FGMA – Sealant Manual.

.11 National Fire Protection Association (NFPA):

.1 NFPA 80: Fire Doors and Windows.

.2 NFPA 251: Standard of Methods of Fire Tests of Building Construction & Materials

.3 NFPA 252: Standard of Methods of Fire Tests of Door Assemblies

.4 NFPA 257: Standard for Fire Test of Window Assemblies

.12 Underwriters Laboratories, Inc. (UL):

.1 UL 9: Fire Tests of Door Assemblies

.2 UL 10 B: Fire Tests of Door Assemblies

.3 UL 10 C: Positive Pressure Fire Tests of Window & Door Assemblies

.4 UL 263: Fire tests of Building Construction and Materials

.13 Canadian Standards:

.1 ULC Standard CAN4-S104: Fire Tests of Door Assemblies.

.2 ULC Standard CAN4-S106: Fire Tests of Window Assemblies

.3 CAN/ULC-S101M: Standard Methods of Fire Endurance Tests.

.14 American Society of Civil Engineers (ASCE)

.1 ASCE 7 – Minimum Design Loads for Buildings and Other Structures; 2005

.15 Manitoba Building Code, latest edition.

1.4 DEFINITIONS

.1 Manufacturer: A firm that produces primary glass, fabricated glass or framing as defined in referenced glazing publications.

1.5 SUBMITTALS

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

.2 Product data: Submit latest edition of manufacturer's product data providing product descriptions, technical data, Underwriters Laboratories, Inc. listings and installation instructions.

.3 Shop Drawings: Include plans, elevations and details of product showing component dimensions; framed opening requirements, dimensions, tolerances, and attachment to structure

.4 Hardware schedule: list of manufacturer supplied hardware and verification of cylinder size complying with Section 08 71 00.

.5 Samples: For following products:

.1 Glass sample-as provided by manufacturer

.2 Sample of frame

.3 Verification of sample of selected finish

.6 Glazing Schedule: Use same designations indicated on drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location.

.7 Warranties: Submit manufacturer's warranty.

.8 Certificates of compliance from glass and glazing Materials manufacturers attesting that glass and glazing Materials furnished for project comply with requirements.

.1 Separate certification will not be required for glazing Materials bearing manufacturer's permanent label designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authority having jurisdiction.

1.6 QUALITY ASSURANCE

.1 Testing Agency Qualifications: Qualified according to

.1 International Accreditation Service for a Type A Third-Party Inspection Body (Field Services ICC-ES Third-Party Inspections Standard Operating Procedures, 00-BL-S0400 and S0401)

.2 International Accreditation Service for Testing Body-Building Materials and Systems

.1 Fire Testing

.1 ASTM Standards E 119

.2 CPSC Standards 16 CFR 1201

.3 NFPA Standards 251, 252, 257

.4 UL Standards 9, 10B, 10C, 1784, UL Subject 63

.5 CAN Standards S 101, S 104, S 106

.3 Installer Qualifications: An experienced installer who has completed glazing similar in Material, design, and extent to that indicated for Project and whose Work has resulted in construction with a record of successful in-service performance.

.4 Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

.5 Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are classified and labeled by UL, for fire ratings indicated, based on testing according to NFPA 252, UL 10B and UL 10C. Assemblies must be factory-welded or come complete with factory-installed mechanical joints and must not require job Site fabrication.

.6 Fire-Rated Wall Assemblies: Assemblies complying with ASTM E119 that are classified and labeled by UL, for fire ratings indicated, based on testing in accordance with UL 263, ASTM E119.

.7 Listings and Labels - Fire Rated Assemblies: Under current follow-up service by Underwriters Laboratories® maintaining a current listing or certification. Label assemblies accordance with limits of manufacturer's listing.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Deliver, store and handle under provisions specified by manufacturer.

1.8 PROJECT CONDITIONS

.1 Obtain field measurements prior to fabrication of frame units. If field measurements will not be available in a timely manner coordinate planned measurements with the Work of other sections.

.2 Coordinate the Work of this section with others effected including but not limited to: other interior and/or exterior envelope components and door hardware beyond that provided by this section.

1.9 WARRANTY

.1 Provide the Pilkington Pyrostop® and Fireframes® standard five-year manufacturer warranty.

PART 2 - PRODUCTS

2.1 FIRE-RATED GLAZING MATERIALS

.1 Manufacturer Glazing Material: "Pilkington Pyrostop®" fire-rated glazing as manufactured by the Pilkington Group and distributed by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 (800-426-0279) fax (800-451-9857) e-mail sales@fireglass.com, web site http://www.fireglass.com

.2 Frame System: "Fireframes® ClearView frame system; fire-rated doors Heat Barrier Series as manufactured and supplied by Technical Glass Products, 8107 Bracken Place SE, Snoqualmie, WA 98065 (800-426-0279) fax (800-451-9857) e-mail sales@fireglass.com web site http://www.fireglass.com

.3 Substitutions: Substitutions as per B7.

2.2 PERFORMANCE REQUIREMENTS

.1 Fire Rating Requirements

.1 Duration -- Doors: Capable of providing a fire rating for 60 minutes

.2 Duration-- Walls: Capable of providing a fire rating for 60 minutes

.2 Design Requirements

.1 Refer to Drawings and manufacturer's typical details.

.2 Low-iron, monolithic, multi-laminate glass with no internal glass spacers.

2.3 MATERIALS-GLASS

.1 Fire Rated Glazing: Composed of multiple sheets of Pilkington Optiwhite™ low iron, high-visible-light transmission glass laminated with an intumescent interlayer.

.2 Impact Safety Resistance: ANSI Z97.1 and CPSC 16CFR1201 (Cat. I and II).

.3 Properties for Glazing

.1 Fire-rating: 60 minutes

.2 Manufacturer's Designation: 60-201

.3 Nominal Thickness: 1-1/16" (27 mm)

.4 Weight: 12.5 lb/ft2 (61.0 kg/m2)

.5 Daylight Transmission (approx.): 86%

.6 Sound Transmission Coefficient: 44

.7 U-Value: .83

.8 Max. Exposed Area: 7,442 in2 (4.80 m2)

.9 Max. Width of Exposed Glazing 63" (1.6 m) OR Max Height of Exposed Glazing 118-1/8" (3.0 m)

.10 Minimum Width 31-9/16" (.80 m)

.4 Logo: Each piece of fire-rated glazing shall be labeled with a permanent logo including name of product, manufacture, testing laboratory (ULC), fire rating period, safety glazing standards, and date of manufacture.

.5 Glazing Accessories: Manufacturer's standard compression gaskets, spacers, setting blocks, intumescent strip, silicone sealant and other accessories necessary for a complete installation.

2.4 MATERIALS –FRAMES AND DOORS

.1 Steel Framing System 60 min. (at doors, only):

.1 Frame: [Steel] profiled formed tubing permanently joined with steel bolts.

.2 Insulation: Insulate framing system against effects of fire, smoke, and heat transfer from either side. Insulate profiled steel tubing using a shell construction that incorporates Promatect-H intermediate interlayer. Firmly pack perimeter of framing system to rough opening with mineral wool fire stop insulation or appropriately rated intumescent sealant.

.3 Frame meets Bullet resistance rating Level 8 per UL 752.

.4 Steel Glazing Beads: Extruded steel beads with dimensions recommended by manufacturer to securely hold glazing material in place.

.5 Fasteners: Type recommended by manufacturer

.6 Glazing Accessories: Set Pilkington Pyrostop glass using calcium silicate, or setting blocks.

.7 Glazing Gaskets, Compounds and tapes: Glaze Pilkington Pyrostop glass with approved EPDM glazing gaskets and closed cell PVC tape.

.2 Steel Door System 60 min.:

.1 Manufacturer's standard single leaf doors with compatible hardware.

.2 Coordinate door hardware with Section 08 71 00 Hardware

2.5 GLAZING COMPOUND FOR FIRE-RATED GLAZING MATERIALS

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

.2 Butt Glazing Silicone Sealant: For the butt glazing assembly, silicone sealant shall be applied to seal the butt joint. The sealant shall be provided by the glass manufacturer.

.3 Butt Glazing Intumescent Strip: For the butt glazing assembly, 9/16" in. (15 mm) wide by 3/16 in. (4 mm) thick tape, shall be installed along the vertical edges of the sections of glass at the butt joint.

.1 GLUSKE — Kerafix 2000 Glazing Tape

.4 Setting Blocks: Hardwood or calcium silicate; glass width by 4 inches by 3/16 inch thick.

.5 Spacers: Neoprene or other resilient blocks of 40 to 50 Shore A durometer hardness, adhesive-backed on one face only, tested for compatibility with specified glazing compound.

.6 Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

2.6 FABRICATION

.1 Furnish interior frame assemblies, pre-welded:

.1 When necessary, splice frames too large for shop fabrication or shipping or to fit in available building openings.

.2 Fit with suitable fasteners.

.3 Knock-down door perimeter frames are not permitted

.2 Field glaze door and frame assemblies.

.3 Factory prepare steel door assemblies and install all hardware.

.4 Fabrication Dimensions: Fabricate fire rated assembly to field dimensions.

.5 Obtain approved Shop Drawings prior to fabrication.

2.7 FINISHES, GENERAL

.1 Comply with NAAMM's "Metal Finishes Manual For Architectural And Metal Products" for recommendations for applying and designating finishes.

.2 Finish frames after assembly.

.3 Appearance of finished work: variations in appearance of abutting or adjacent pieces are acceptable. Noticeable variations in the same piece are not acceptable.

2.8 POWDERCOAT FINISHES

.1 Powder-Coat Finish: Polyester Super Durable powder coating which meets AAMA 2604 for chalking and fading. Apply manufacturer's standard powder coating finish system applied to factory-assembled frames before shipping, complying with manufacturer's recommended instructions for surface preparation including pretreatment, application, and minimum dry film thickness.

.2 Acceptable manufacturer’s: Tiger Drylac, RAL colour chart.

.3 Colour and Gloss as selected by Contract Administrator from manufacturer’s full range.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Glass:

.1 Examine glass framing, with glazier present, for compliance with the following:

.1 Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.

.2 Minimum required face or edge clearances.

.3 Observable edge damage or face imperfections.

.2 Do not proceed with glazing until unsatisfactory conditions have been corrected.

.3 Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

.2 Frames:

.1 Examine substrates and members to which the Work of this section attaches or adjoins prior to frame installation.

.2 Provide openings plumb, square and within allowable tolerances.

.3 Notify Contract Administrator of any conditions which jeopardize the integrity of the proposed system.

.4

.5 Do not proceed until such conditions are corrected.

3.2 INSTALLATION

.1 Glass: See Fireframes ClearView Installation Manual

.2 Frames: Follow manufacturer's written instructions and approved Shop Drawings.

3.3 REPAIR AND TOUCH UP

.1 Limited to minor repair of small scratches. Use only manufacturer's recommended products.

.1 Such repairs shall match original finish for quality or Material and view.

.2 Remove and replace glass that is broken, chipped, cracked, abraded, or damaged.

3.4 PROTECTION AND CLEANING

.1 Protect glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

.6 Do not clean with astringent cleaners. Use a clean "grit free" cloth and a small amount of mild soap and water or mild detergent.

.7 Do not use any of the following:

.1 Steam jets

.2 Abrasives

.3 Strong acidic or alkaline detergents, or surface-reactive agents

.4 Detergents not recommended in writing by the manufacturer

.5 Do not use any detergent above 77 degrees F

.6 Organic solvents including but not limited to those containing ester, ketones, alcohols, aromatic compounds, glycol ether, or halogenated hydrocarbons.

.7 Metal or hard parts of cleaning equipment must not touch the glass surface

.2 Protect glass from contact with contaminating substances resulting from construction operations, including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

.3 Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Performance. Wash glass as recommended by glass manufacturer.

END OF SECTION