

PART 1 GENERAL

1.1 Related Sections

- .1 Door Hardware Section 08 71 00
- .2 Joint Sealers: Caulking of joints between frames and other building components.
Section 07 92 00
- .3 Door Hardware: Supply of finish hardware, including weather stripping and mounting heights
Section 08 71 00
- .4 Glazing: Glazing Section 08 80 50
- .5 Painting Section 09 91 10

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 (Galvanealed) by the Hot-Dip Process.
 - .2 ASTM B 29-(92), Specification for Pig Lead.
 - .3 ASTM B 749-85(1991), Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.181-92, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
 - .3 CAN/CGSB-51.20-M87, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - .4 CGSB 51-GP-21M-78, Thermal Insulation, Urethane and Isocyanurate, Unfaced.
- .3 Canadian Standards Association (CSA).
 - .1 CSA A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings.
 - .2 CAN/CSA-G40.21-M92, Structural Quality Steels.
 - .3 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door and Frame Manufacturer's Association, (CSDFMA).
 - .1 CSDFMA, Specifications for Commercial Steel Doors and Frames, 1990.
 - .2 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .5 National Fire Protection Association (NFPA).
 - .1 NFPA 80-1992, Fire Doors and Windows.
 - .2 NAPA 252-1990, Door Assemblies, Fire Tests of.
- .6 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN-S104M-M80(R1985), Fire Tests of Door Assemblies.
 - .2 CAN-S105M-M85, Fire Door Frames.

- 1.3 Design Requirements
 - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
 - .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, glazed, louvered, 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 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 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, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- PART 2 PRODUCTS**
- 2.1 Materials
 - .1 Hot dipped galvanized steel sheet: to ASTM A 653M, minimum base steel thickness in accordance with CSDFMA Table 1 – Thickness for Component Parts.
 - .2 Reinforcement channel: to CAN/CSA-G40.21, Type 44W, coating designation to ASTM A 653M.
 - .3 Cast or rolled pure sheet lead: to ASTM B 29, 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, 24.5 mm 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, semi-rigid RSI 2.3
 - .2 Polyurethane: to CGSB 51-GP-21M rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m³.

- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250°C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E 152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency have 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.
- 2.5 Paint
 - .1 Steel doors and frames shall be field painted in accordance with Section 09 91 10. Weatherstripping 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 50.
- .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: 14 gauge minimum thermally broken type construction.
 - .4 Interior frames: 14 gauge minimum welded type construction.
 - .5 Blank, reinforce, drill and tap frames for mortised, template hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
 - .6 Protect mortised cutouts with steel guard boxes.
 - .7 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
 - .8 Manufacturer's nameplates on frames and screens are not permitted.
 - .9 Conceal fastenings except where exposed fastenings are indicated.
 - .10 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
 - .11 Insulation 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.
- 2.9 Frames: Welded Type
 - .1 Welding in accordance with CSA W59.
 - .2 Accurately mitre or mechanically joint frame product and securely weld on inside of profile.
 - .3 Cope accurately and securely weld butt joints of mullions, transom bars, centre rails and sills.
 - .4 Grind welded joints and corners to a flat plane, fill with metallic paste and sand to uniform smooth finish.
 - .5 Securely attach floor anchors to inside of each jamb profile.

- .6 Weld in 2 temporary jamb spreaders per frame to maintain proper alignment during shipment.
 - .7 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.
- 2.10 Door Fabrication General
- .1 Doors: swing type, flush, with provision for glass and/or louver openings as indicated.
 - .2 Exterior doors: honeycomb construction. Interior doors: honeycomb construction.
 - .3 Fabricate doors to tack and fill edges at perimeter every 150mm. 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.
 - .5 Blank, reinforce, drill doors and tap for mortised, template 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, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
 - .10 Manufacturer's nameplates on doors are not permitted.
- 2.11 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 fact sheet for interior doors from 16 gauge sheet steel with temperature rise rated core laminated under pressure to face sheets.
- 2.12 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.
- 2.13 Thermally Broken Doors And Frames

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 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 Barrier And Vapour Retarder.

3.3 Door Installation

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 – Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm.
 - .2 Latch side and head: 1.5 mm.
 - .3 Finished floor, top of carpet, non-combustible sill, and thresholds: 13 mm.
- .3 Adjust operable parts for correct function.

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 50 – Glazing.

PART 1 GENERAL

- 1.1 Related Work
 - .1 Finish Carpentry Section 06 20 00
 - .2 Door Hardware Section 08 71 00
 - .3 Glazing Section 08 80 50
 - .4 Painting Section 09 91 10
- 1.2 References
 - .1 CSA 0115-M1982 Hardwood and Decorative Plywood
 - .2 CAN/CSA 0132.2 Series-90 Wood Flush Doors
 - .3 CAN/CGSB-71.19-M88 Adhesive, Contact, Sprayable
 - .4 CAN/CGSB-71.20-M88 Adhesive, Contact, Brushable
- 1.3 Reference Standards
 - .1 Do architectural woodwork for doors to Millwork Standards of the Architectural Woodwork Manufacturers Association (AWMAC) 2003, except where specified otherwise.
- 1.4 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittals.
 - .2 Indicate door types and cut-outs for lights and louvers.
- 1.5 Regulatory Requirements
 - .1 Fire-resistance rated for wood doors: certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- 1.6 Protection
 - .1 Protect doors from dampness. Arrange delivery of doors after any Work causing abnormal humidity has been completed.
 - .2 Store doors in a well ventilated room, off the floor, in accordance with manufacturer's recommendations.
 - .3 Protect doors from scratches, handling marks and other damage.

PART 2 PRODUCTS

- 2.1 Wood Flush Doors
 - .1 Solid core: to CAN/CSA -0132.21.
 - .1 Construction: Particleboard core, wood chips bonded with synthetic resin, complete with stiles and rails bonded to core and sanded prior to application of faces. (to be used for interior use only)
 - .2 Face Panels: Paint Grade birch, Rift Cut, uniform white face: confirm veneer to be used with Contract Administrator by providing sample for approval.
 - .3 Adhesive: Type 1 (Waterproof). Lockweld Adhesives Systems Are Not Acceptable.

2.2 Fabrication

- .1 Vertical edge strips to match face veneer.
- .2 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side
- .3 Top and bottom of doors to be sealed.

PART 3 EXECUTION

3.1 Installation

- .1 Install doors and hardware in accordance with manufacturer's printed instructions.
- .2 Adjust hardware for correct function.

3.2 Adjustment

- .1 Re-adjust doors and hardware just prior to completion of building to function freely and properly.

PART 1 GENERAL

1.1 Work Included

- .1 Insulated sectional metal thermocore overhead doors.

1.2 Related Work

- .1 Electrical Power Supply – Division 26

1.3 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittals.
- .2 Clearly indicate material, operating mechanisms, and required clearance.

1.4 Guarantee

- .1 Provide a written guarantee stating that items specified under this section are guaranteed against defects in material, workmanship and operation for one (1) year from date of Total Performance.

1.5 Design Requirements

- .1 Design door panels to withstand wind load of 96kg/m² with a maximum horizontal deflection of 1/240 of opening width.

PART 2 PRODUCTS

2.1 Doors

- .1 Steel Sections: Door sections shall be constructed from galvanized sheet steel, a corrosion-resistant embossed steel no less than 0.4 mm thick, coated with approximately 55% aluminium, 1.6% silicon, with the balance being zinc.
- .2 Door sections shall be manufactured by a continuous formed- in-place polyurethane lamination process resulting in a homogeneous sandwich of even textured polyurethane insulation of metal/foam/metal construction to form a section 41 mm thick. Sections shall be rolled-formed to produce a thermal break preventing heat or cold conductivity. Sections shall have an RSI of 2.32.
- .3 Joints between sections shall be designed with pivotable round horizontal links to eliminate accumulated water from flowing down the inside of the door when opened.
- .4 Sections shall be equipped with 1.6 mm steel end caps for bracket and end hinge attachment.
- .5 Exterior Finish: Embossed steel sections shall be mill finished to accept field painting.

2.2 Hardware

- .1 Weather Seals: Thermalplastic rubber tube seal shall be fitted inside every joint between the sections to prevent air infiltration.
 - .1 Top section of the door shall be EPDM rubber sealing strip to provide firm seal against the header when the door is in the closed position.
 - .2 Door with an opening width wider than 6 mm shall be provided with an EPDM rubber head flexible seal fitted to aluminium extruded strip. This flexible seal shall provide proper seal against header doorframe regardless of outside/inside temperature variances.

- .2 EPDM Rubber Severe Weather Blade-Type Jamb Seal: This seal shall attach to the nylon jamb seal retainer to form a weather-tight seal against the outside skin of the door.
- .3 EPDM Double –Bottom Sealing Weather-strip: This combination double flanged/'o' type bottom weather-strip shall conform to minor irregularities in the floor.
- .4 Track: Track shall be 76 mm heavy gauge galvanized steel designed for clearances shown. Provide complete track assembly including brackets, bracing, and reinforcing for rigid support of the track for the required door type and size. Slope tracks at proper angle from vertical to ensure tight closure at jambs when the door is closed. Weld or bolt to track supports. Vertical tracks shall be 2.2 mm thick, horizontal tracks shall be 2.2 mm thick and additionally reinforced.
- .5 Reinforcements and Supports: Provide galvanized steel track reinforcement and support members. Secure, reinforce, and support tracks as required for size and weight of door to provide strength and rigidity, and to ensure against sag, sway, and detrimental vibration during opening and closing of doors.
 - .1 Support and attach tracks and attached to wall. Support horizontal (ceiling tracks) with continuous angle welded in accordance with manufacturer's specification for size and weight of door.
- .6 Glazing: Standard Full Vision- Window Panel glazing material shall be glass dual pane.
- .7 Counterbalancing System: all doors shall be equipped with helical wound torsion springs having a minimum spring life of 25,000 cycles. Spring material shall be made of high tensile music wire.
- .8 Trussing: Doors shall be engineered to withstand 96kg/m² wind load. Trussing for wind reinforcement is standard on doors wider than 6 m. doors over 760 mm height utilize a reinforced truss.
- .9 Torsion Shaft: All doors shall be supplied with 34 mm solid steel shaft keyed the entire shaft length, in accordance with manufacturer's specifications.
- .10 Roller Brackets: Provide heavy-duty fully adjustable roller brackets to each end reinforcement place per manufacturer's recommendations. The adjustable roller brackets are to provide an easy adjustment of the door to the jamb to achieve the proper seal. Use self-tapping fasteners to secure brackets to the door sections.
 - .1 Provide heavy-duty, rust resistant hardware, with galvanized fasteners, to suit type of door.
- .11 Bottom Corner Brackets: All bottom corner brackets shall be equipped with adjustable roller brackets (except reinforced heavy duty bottom corner bracket) all brackets shall feature the locking wedge on the cable fastener for complete adjustments (except reinforced heavy duty bottom corner bracket, which shall use a clamp).
- .12 Rollers: Provide heavy-duty rollers, with 10 steel ball bearings in case-hardened steel races. Extend roller shaft through both brackets where double brackets are required. Provide roller tires to suit size of track.
- .13 Step handles: Provide aluminium cast recessed step plate on outside door with attaching lift handle for inside of door.
- .14 Locks: provide an interior slide bolt.
- .15 Cable Drums: Provide cast aluminium cable drums grooved to receive the proper diameter cable for the weight of the door with two extra safety wraps and dual locking screws.

- .16 Cable Drums: Galvanized aircraft type rated at 50,000 cycles or better.
- .17 Provide additional support mounting brackets to top door section to accept overhead door operator, galvanized steel, size and gauge to suit, to prevent door deflection.
- 2.3 Operation
 - .1 Equip doors for operation by:
 - .1 Hand, install two handles on inside face of door.
 - .2 Chain hoist with nylon rope.
 - .3 Electrical push-pull type operator.
- 2.4 Electrical Operator (Trolley Type For Standard Lift)
 - .1 Commercial type, industrial grade electrical motors, controller units, remote push button stations, relays, and other electrical components: to CSA and ULC approval.
 - .2 Power Supply: 240 V, single phase, 60 Hz.
 - .3 Controller Units with integral motor reversing starter, two heater elements for overload protection, pilot light, including three push buttons with open-stop-close designations in English and control relays as applicable.
 - .4 Digital Wireless Keypad Entry Switch: As indicated on plan, flush mounted jamb, located 1370 mm above floor level.
 - .5 Provide combination roll rubber safety switch with limit switches for full length of bottom rail of bottom section of door, enabling door to reverse to open position when coming in contact with object on closing cycle.
 - .6 Manual Safety Release: Wire cable leading from door panel to drive yolk, when pulled during power failure, to free door for manual operation.
- 2.5 Safety Controls
 - .1 Provide controls that reverse door closure when downward motion is physically impeded.
 - .2 Provide electronic/infrared sensors, set at manufacturer's suggested height to reverse downward motion of door when the sensors detect an object in the path of the door.

PART 3 EXECUTION

- 3.1 Installation
 - .1 Install door, track, and operating equipment complete with necessary hardware, jamb and head mold stops, anchors, etc.
 - .1 Mount counterbalance mechanism with manufacturer's fully adjustable ball bearing brackets at each end of the shaft. Furnish torsion shaft centre support bearings as required for size and weight of doors. Unsupported span not to exceed 2.4 m.
 - .2 Fasten vertical track assembly to framing at not less than 600 mm on centre. Hang horizontal track from structural overhead framing with angle or channel hangers, welded and bolt-fastened in place. Provide sway bracing, diagonal bracing, and reinforcing as required for rigid installation of track and door operating equipment.

- .3 Upon completion of installation, including Work by other trades, lubricate, test and adjust doors to operate easily, free from warp, twist, or distortion and fitting weather tight for entire perimeter.
- .2 Install electrical motor controller units, push button stations, relays and other electrical equipment required for door operation.

PART 1 GENERAL

1.1 Related Sections

- .1 Door Hardware Section 08 71 00
- .2 Joints Sealers Section 07 92 00
- .3 Division 26 - Electrical

1.2 References

- .1 Aluminum Association Designation System for Aluminum Finishes-1997.
- .2 American Society for Testing and Materials (ASTM).
 - .1 ASTM E 330-97, Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
- .3 Canadian General Standards Board (CGSB).
 - .1 CGSB 1.40-M89, Primer, Structural Steel, Oil Alkyd Type.
- .4 Canadian Standards Association (CSA).
 - .1 CAN/CSA-G40.21-98, Structural Quality Steels.
 - .2 CSA G164-M92, Hot Dip Galvanizing of Irregularly Shaped Articles.

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 35°C.
 - .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 Shop Drawings

- .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Indicate each type of door and frame, extrusion profiles, method of assembly, section and hardware reinforcement, locations of exposed fasteners, finishes and location of manufacturer's nameplates.
- .3 Submit catalogue details for each type of door and frame illustrating profiles, dimensions and methods of assembly.

1.5 Closeout Submittals

- .1 Provide maintenance data for cleaning and maintenance of Aluminum finishes.

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.

PART 2 PRODUCTS

2.1 Materials

- .1 Aluminum extrusions: Aluminum Association alloy AA6063-T6 anodizing quality.

- .2 Steel reinforcement: to CAN/CSA-G40.21, grade 300 W.
 - .3 Fasteners: stainless steel, finished to match adjacent material.
 - .4 Weatherstrip: mohair pile.
 - .5 Door bumpers: black neoprene.
 - .6 Isolation coating: alkali resistant.
 - .7 Glass: Factory sealed double glazing unit; 25 mm overall thickness, comprised of laminated film 0.030 inches thick, clear, glass each side of air space to CAN/CGSB-12.8-M.
 - .8 Sealants: to CAN/CGSB 19.13-M87.
 - .9 Door panel: 1" O.D. size comp. Panel. Exterior faces to match Aluminum finish.
- 2.2 Aluminum Doors
- .1 Acceptable material: Alumicor series 600B or Kawneer wide stile 500 series with 249-250 center rail and 200-035 bottom rail.
 - .1 Glazing stops: tamperproof type.
 - .2 Hardware: see Door and Hardware Schedule, Section 08 71 00.
- 2.3 Aluminum Frames
- .1 Construct insulated frames of Aluminum extrusions with minimum wall thickness of 3 mm.
 - .2 Frame members 114 x 44.5 mm nominal size not thermally broken, for flush glazing.
 - .3 Approved product: Kawneer 560 series with 12" bottom rail, or approved equal.
- 2.4 Aluminum Finishes
- .1 Finish exposed surfaces of Aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
 - .1 Standard Bronze anodic finish.
 - .2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.
- 2.5 Steel Finishes
- .1 Finish steel clips and reinforcing steel with zinc coating to CSA G164.
- 2.6 Fabrication
- .1 Doors and frames to be by same manufacturer.
 - .2 Fabricate doors and frames to profiles and maximum face sizes as shown. Provide minimum 22 mm bite for insulating glazed units.
 - .3 Provide structural steel reinforcement as required.
 - .4 Fit joints tightly and secure mechanically.
 - .5 Conceal fastenings.
 - .6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 – Door Hardware.
 - .7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

PART 3 EXECUTION

3.1 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.

3.2 Glazing

- .1 Glaze Aluminum doors and frames in accordance with Section 08 80 50 – Glazing.

3.3 Caulking

- .1 Seal joints to provide weathertight seal at outside and air, vapour seal at inside.
- .2 Apply sealant in accordance with Section 07 92 00 – Joint Sealers. Conceal sealant within the aluminum Work except where exposed use is permitted by Contract Administrator.

PART 1 GENERAL

1.1 Related Sections

- .1 Glazing Section 08 80 50

1.2 Work Included

- .1 The Work included under this section shall conform to the definitions in the “Manitoba Trade Definitions” handbook produced by the Winnipeg Construction Association.

1.3 References

- .1 CAN3-A440-M84 – Omnibus Window Standard and CAN 3-A44-M90.

1.4 Performance

- .1 Window components to provide for expansion and contraction caused by a cycling temperature range of 100 degrees C without causing detrimental effects to components. Limit mullion deflection to 1/200, or flexure limit of glass with full recovery of glazing materials, whichever is less.

- .2 Classification rating to CAN 3-A44-M90

	<u>Air</u>	<u>Water</u>	<u>Wind</u>
Awning	A3	B7	C4
Casement	A3	B6	C3
Fixed		B7	C4
Single Hung	A3	B7	C5

- .3 There shall be no uncontrolled water penetration under designed loads. Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system , to exterior.

1.5 Shop Drawings And Product Data

- .1 Submit shop drawings and product data to requirements of Section 01 33 00 Submittal Procedures.

- .2 Indicate on shop drawings wall opening and component dimensions; wall opening tolerances required; anchorage and fasteners; affected related Work; installation requirements.

1.6 Delivery, Storage And Handling

- .1 Deliver products to site, and store and protect products on site, to requirements Section 01 61 00 – Product Requirements.

- .2 Accept products of this section on site in new condition and verify no damage.

1.7 Warranty

- .1 Provide a TWENTY (20) year Warranty for all fibreglass frame and sash components. Warranty to cover window system for failure to meet specified requirements. Warranty applies to product only with labour not included.

- .2 Provide a TEN (10) year Warranty for the failure of the air seal due to defects in the material or workmanship. Warranty applies to product only with labour not included.

PART 2 PRODUCTS

2.1 Materials

- .1 All frame and sash profiles are made from Pultruded Fiberglass, having a minimum of wall thickness of 0.090" (2.3 mm), with minimum glass content of 60%. Non-structural accessory members are permitted to be in vinyl or aluminum and are identified as such.
- .2 Fasteners: Non magnetic, stain and corrosion resistant stainless steel to ASTM E-149.
- .3 Insect Screen: to CGSB 79-GP-1M and CAN3-A440-M84 Heavy Duty Classification with 18 x 14 aluminum mesh in baked enamel aluminum frame – colour to match window frame.
- .4 Sill and Flashings: aluminum to match window framing.

2.2 Weather-Stripping

- .1 Q-Lon air-seal gasket on interior with Santoprene bulb-type "rain screen" gasket on the exterior to provide weather barrier. Dust seal to be flexible PVC. Secondary seal to be dual Durometer Santoprene.

2.3 Windows

- .1 Standard of acceptance:
 - .1 Duxton Windows Ltd. (Inline Fibreglass Ltd.): Sovereign series 325, narrow brick mould, low profile typical.
 - .2 Accurate Dorwin Ltd. Windows (Omniglass Ltd.): Awning series or approved equal.

2.4 Hardware

- .1 Concealed Stainless Steel Hinges, E-Gard Roto Gear Operators and metal Cam are manufactured by "TRUTH Hardware" or approved equal. Hardware is installed with fasteners into patented back-up reinforcements.
- .2 All operable windows to have restricted operation, so that no object larger than a 4" diameter sphere may pass through.

2.5 Glass

- .1 All windows are glazed as specified in Section 08 80 50. Glass thickness shall be in accordance with applicable Building Code.

2.6 Glazing Method

- .1 Laid-in glazing using EPDM non-shrink rubberized glass stop locked-in from the interior provides a secure and positive seal for the glass and easier after install glass servicing.

2.7 Insect Screen

- .1 Roll-formed aluminum frame with friction fit corner keys. Screen mesh held in place by spline. Screens are mounted on the interior and are removable.

2.8 Fabrication

- .1 Frame and sash corners are connected with moulded reinforced polyester shearblocks and mechanically secured. All joints are factory sealed and neatly fitted together. The perimeter of open-back frames shall be filled with insulation. Fabricate windows allowing for minimum clearances and shim spacing around perimeter of assembly, yet enabling

installation. Make corner joints flush, hairline, and weatherproof. Seal corner joints with sealant. Develop drainage holes with moisture pattern to exterior.

2.9 Finishes

.1 The exposed surfaces to have 10 year warranty against fading, peeling or cracking are:

.1 Isocyanate-free 2 part Polymer Enamel with a minimum dry film thickness of 1.5 mils with a medium gloss of 25-55. Finish shall resist chipping, blistering, chalking discoloration and aging under all atmospheric conditions. Conforms to AAMA 603 and 613 Organic Coatings.

.2 Concealed Steel Items: Galvanized in accordance with CSA G164M.

.3 Colours: Standard colour (Commercial Brown)

PART 3 Execution

3.1 Inspection

.1 Verify that surfaces are ready to receive Work and opening dimensions are as indicated on shop drawings.

.2 Verify wall openings and adjoining air and vapour seal materials are ready to receive Work of this Section.

.3 Beginning of installation means acceptance of substrate.

3.2 Installation

.1 Installation shall be performed by experienced installers in accordance with manufacturer instructions and CSA A-440.4 Standards. Window shall be plumb and square after installation is complete and sealed to both interior and exterior wall with a high quality sealant around the perimeter of the frame. If perimeter cavity is to be foamed, additional anchorage may be required to prevent bowing. It shall be the responsibility of the installers to make all necessary final adjustments to ensure normal and smooth operation.

.2 Align window frame plumb and level, free of warp or twist. Maintain dimensional tolerances, aligning with adjacent Work.

.3 Coordinate attachment and seal of air and vapour barrier materials.

.4 Pack fibrous insulation in shim spaces at perimeter to maintain continuity of thermal barrier.

.5 Install glass in accordance with Section 08 80 50.

.6 Install perimeter type sealant, backing materials, and installation requirements in accordance with Section 07 92 00. Apply sealant to ends of sill for watertight seal.

3.3 Maintenance

.1 Occasional wash of glass and frame components with non-abrasive detergent is recommended.

PART 1 GENERAL

1.1 Related Sections

- .1 Door Hardware Section 08 71 00
- .2 Finish Carpentry Section 06 20 00
- .3 Steel Doors and Frames Section 08 12 13
- .4 Aluminum Doors and Frames Section 08 41 13
- .5 Division 26 - Electrical

1.2 References

- .1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturer's Association.
- .2 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-69.17-M86, Bored and Pre-assembled Locks and Latches.
 - .2 CAN/CGSB-69.18-M90 / ANSI/BHMA A156.1-1981 Butts and Hinges.
 - .3 CAN/CGSB-69.19-93 / ANSI/BHMA A156.3-1984, Exit Devices.
 - .4 CAN/CGSB-69.20-M90 / ANSI/BHMA A156.4-1986, Door Controls (Closers).
 - .5 CAN/CGSB-69.21-M90 / ANSI/BHMA A156.5-1984, Auxiliary Locks and Associated Products.
 - .6 CAN/CGSB-69.24-M90 / ANSI/BHMA A156.8-1982, Door Controls- Overhead Holders.
 - .7 CAN/CGSB-69.26-96 / ANSI/BHMA A156.10-1985, Power Operated Pedestrian Doors.
 - .8 CAN/CGSB-69.29-93 / ANSI/BHMA A156.13-1980, Mortise Locks and Latches.
 - .9 CAN/CGSB-69.30-93 / ANSI/BHMA A156.14-1985, Sliding and Folding Door Hardware.
 - .10 CAN/CGSB-69.31-M89 / ANSI/BHMA A156.15-1981, Closer/Holder Release Device.
 - .11 CAN/CGSB-69.32-M90 / ANSI/BHMA A156.16-1981, Auxiliary Hardware.
 - .12 CAN/CGSB-69.33-M90 / ANSI/BHMA A156.17-1987, Self-Closing Hinges and Pivots.
 - .13 CAN/CGSB-69.34-93 / ANSI/BHMA A156.18-1984, Materials and Finishes.
 - .14 CAN/CGSB-69.35-M89 / ANSI/BHMA A156.19-1984, Power Assist and Low Energy Power Operated Doors.
 - .15 CAN/CGSB-69.36-M90 / ANSI/BHMA A156.20-1984,

1.3 Requirements Regulatory Agencies

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

- 1.4 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.
- 1.5 Closeout Submittals
 - .1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit hardware for incorporation into manual specified in Section 01 78 10 - Closeout Submittals.
 - .2 Instruct maintenance staff regarding proper care, cleaning and general maintenance on door hardware.
- 1.6 Extra Materials
 - .1 Provide maintenance materials in accordance with Section 01 78 10 - Closeout Submittals.
 - .2 Supply two sets of wrenches for door closers, locksets, and fire exit hardware.
- 1.7 Delivery and Storage
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 – Product Requirements.
 - .2 Store finishing hardware in locked, clean and dry area.
 - .3 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.

PART 2 PRODUCTS

- 2.1 Hardware Items
 - .1 Only door locksets and latch sets listed on CGSB Qualified Products List are acceptable for use on this project.
 - .2 Use One Manufacturer's Products For All Similar Items.
- 2.2 Door Hardware
 - .1 Locks and Latches:
 - .1 Bored and pre-assembled locks and latches to: CAN/CGSB-69.17, as stated in Hardware Schedule.
 - .2 Lever handles: plain design.
 - .3 Normal strikes: box type, lip projection not beyond jamb.
 - .4 Cylinders: key into keying system as instructed by the Contract Administrator.
 - .5 Finished: as specified in Hardware Schedule.
 - .2 Butts and Hinges:
 - .1 Butts and hinges to: CAN/CGSB-69.20, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.
 - .3 Exit Devices to: CAN/CGSB-69.19, type modern design.

- .4 Door Closers and Accessories
 - .1 Door controls (closers): to CAN/CGSB-69.20.
- .5 Door Operators:
 - .1 Power-operated pedestrian doors to CAN/CGSB-69.26.
 - .2 Power assist and low energy power operated doors to: CAN/CGSB-69.35.
- .6 Smoke Seal:
 - .1 Neoprene bulb, fire resistant, adhesive backed, set in doorframe rabbet.
- 2.3 Fastenings
 - .1 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
 - .2 Exposed fastening devices to match finish of hardware.
 - .3 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.
 - .4 Use fasteners compatible with material through which they pass.
- PART 3 EXECUTION**
- 3.1 Installation Instructions
 - .1 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their Work to receive hardware.
 - .2 Furnish manufacturer's instructions for proper installation of each hardware component.
 - .3 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 Manufacturer's Association.
 - .4 Where Doorstop Contacts Door Pulls, Mount Stop To Strike Bottom Of Pull.
- 3.2 Mounting Heights
 - .1 Maintain the following mounting heights above finished floor for door from finished floor to centre line of hardware item:
 - .1 Locksets 900
 - .2 Push/Pulls 1050
 - .3 Deadlocks 1070
 - .4 Panic Devices 900
 - .5 Auto Openers 900
- 3.3 Set-Up Keying System
 - .1 Turn over keys to Contract Administrator.

PART 1 GENERAL

- 1.1 Related Sections
 - .1 Fibreglass Windows Section 08 53 11
- 1.2 References
 - .1 American National Standards Institute (ANSI)
 - .1 ANSI/ASTM E 330-97e1, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
 - .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM C 542-94, Specification for Lock-Strip Gaskets.
 - .2 ASTM E 84-99, Test Method for Surface Burning Characteristics of Building Materials.
 - .3 ASTM F 1233-98, Test Method for Security Glazing Materials and Systems.
 - .3 Canadian Door and Window Manufacturers Certification Program.
 - .4 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-12.1-M90, Tempered or Laminated Safety Glass.
 - .2 CAN/CGSB-12.2-M91, Flat, Clear Sheet Glass.
 - .3 CAN/CGSB-12.3-M91, Flat, Clear Float Glass.
 - .4 CAN/CGSB-12.8-97, Insulating Glass Units.
 - .5 CAN/CGSB-12.10-M76, Glass, Light and Heat Reflecting.
 - .6 CAN/CGSB-12.11-M90, Wired Safety Glass.
 - .5 Canadian Standards Association (CSA)
 - .1 CSA A440.2-98, Energy Performance Evaluation of Windows and Sliding Glass Doors.
 - .6 Environmental Choice Program (ECP)
 - .1 ECP-45-92, Sealants and Caulking.
 - .7 Flat Glass Manufacturers Association (FGMA) Glazing Manual.
- 1.3 Performance Requirements
 - .1 Provide continuity of building enclosure vapour air barrier using glass and glazing materials as follows:
 - .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 E 330.
 - .3 Limit glass deflection to 1/200 with full recovery of glazing materials.
- 1.4 Shop Drawings
 - .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

- 1.5 Closeout Submittals
 - .1 Provide maintenance data including cleaning instructions for incorporation into manual specified in Section 01 78 10 - Closeout Submittals.
- 1.6 Quality Assurance
 - .1 Perform Work in accordance with FGMA Glazing Manual for glazing installation methods.
 - .2 Provide testing of glass under provisions of Section 01 45 00 - Quality Control.
- 1.7 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.
- PART 2 PRODUCTS**
- 2.1 Materials
 - .1 Type A: Float Glass for interior units: CAN2-12.3M; glazing quality, thickness to suit opening size and thickness and shall be in accordance with applicable Building Code, clear.
 - .2 Type D: Insulated Glass Units at entrances: CAN2-12.8M; double 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. Inter-pane space of a full 13 mm, purged dry and hermetically sealed, (22 mm) insulating glass units with Argon and Super Spacer with R-value of 4.2 (cog) and SHGC of .52.
 - .3 Type E: Insulated Glass Units for all exterior south and west facing windows: CAN2-12.8M; double pane, outer and inner pane of Type A float glass, glass thickness to suit opening size and in accordance with applicable Building Code, full 13 mm inter-pane space purged dry and hermetically sealed for total unit thickness of 22 mm. Include Low-e coating on #2 surface, warm edge spacer (Super Spacer or XL bar) and Argon fill for visible light transmission or 70% min., minimum R value of 4.2 (cog) min. and SHGC of 0.44 maximum.
- 2.2 Accessories
 - .1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.
 - .2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.
 - .3 Glazing Tape:
 - .1 Preformed butyl compound with integral resilient tube spacing device, 10-15 Shore A durometer hardness to ASTM D 2240, coiled on release paper, size to suit application, black colour.
 - .2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption of 25%, to effect an air and vapour seal; size to suit application.
 - .4 Glazing splines: resilient silicone, extruded shape to suit glazing channel retaining slot, colour as selected.

- .5 Glazing clips: manufacturer's standard type.
- .6 Lock-strip gaskets: to ASTM C 542.
- .7 Mirror attachment accessories:
 - .1 Stainless steel clips.

PART 3 EXECUTION

3.1 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.

3.2 Preparation

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

3.3 Installation: Exterior- Dry Method (Preformed Glazing)

- .1 Cut glazing tape or spline to length; install on glazing light. Seal corners by butting tape or spline and sealing junctions with sealant.
- .2 Place setting blocks at $\frac{1}{4}$ points, with edge block maximum 150 mm from corners.
- .3 Rest glazing on setting blocks and push against fixed stop with sufficient pressure to attain full contact.
- .4 Install removable stops without displacing glazing tape or spline. Exert pressure for full continuous contact.
- .5 Trim protruding tape edge.

3.4 Installation: Interior – Dry Method (Tape And Tape)

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.6 mm above sight line.
- .2 Place setting blocks at $\frac{1}{4}$ points, with edge maximum 150 mm from corners.
- .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.

3.5 Installation: Mirrors

- .1 Set mirrors in accordance with manufacturer's instructions to be tamperproof.
- .2 Place plumb and level.

3.6 Cleaning

- .1 Remove glazing materials from finish surfaces.

- .2 Remove labels after work is complete.
- .3 Clean glass and mirrors.
- 3.7 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.