1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 05 50 00 – Metal Fabrications.

.2 Section 06 10 00 – Rough Carpentry.

.3 Section 06 20 00 - Finish Carpentry.

.4 Section 09 91 00 – Painting.

1.02 REFERENCE STANDARDS

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)
  .1 Architectural Woodwork Quality Standards, Edition 2 (2014) plus all errata through April 29, 2016.

.2 CSA International
  .1 CAN/CSA O132.5-M1992(R1998), Stile and Rail Wood Doors.
  .2 CAN/CSA O141-05(R2014), Softwood Lumber.

.3 National Lumber Grading Authority (NLGA)
  .1 NLGA Standard Grading Rules for Canadian Lumber 2010.

1.03 DESIGN INTENT

.1 For new ‘Ledged & Braced’ sliding barn door and new ‘Framed, Ledged & Braced’ single swing door, match existing ‘Ledged & Braced’ barn door construction (except new door shall be sliding rather than swing), and existing ‘Framed, Ledged & Braced’ swing door.
  .1 Image at end of this specification Section shows general intent of single swing door (‘Framed, Ledged & Braced’), including hardware.
  .2 Barn door hardware, with exception of overhead sliding hardware, and swing door hardware to match existing pulls, hinges, latches, etc..
    .1 For door locks, refer to Door Hardware Schedule.

1.04 DEFINITIONS

.1 Bolection moulding: a moulding on a panel that projects above the adjoining surfaces.

.2 Box locks: a surface-mounted lock with the mechanism in a rectangular metal or wood casing.

.3 Bead: a small, linear moulding with a round cross-section that ranges from quarter round to three quarter round.

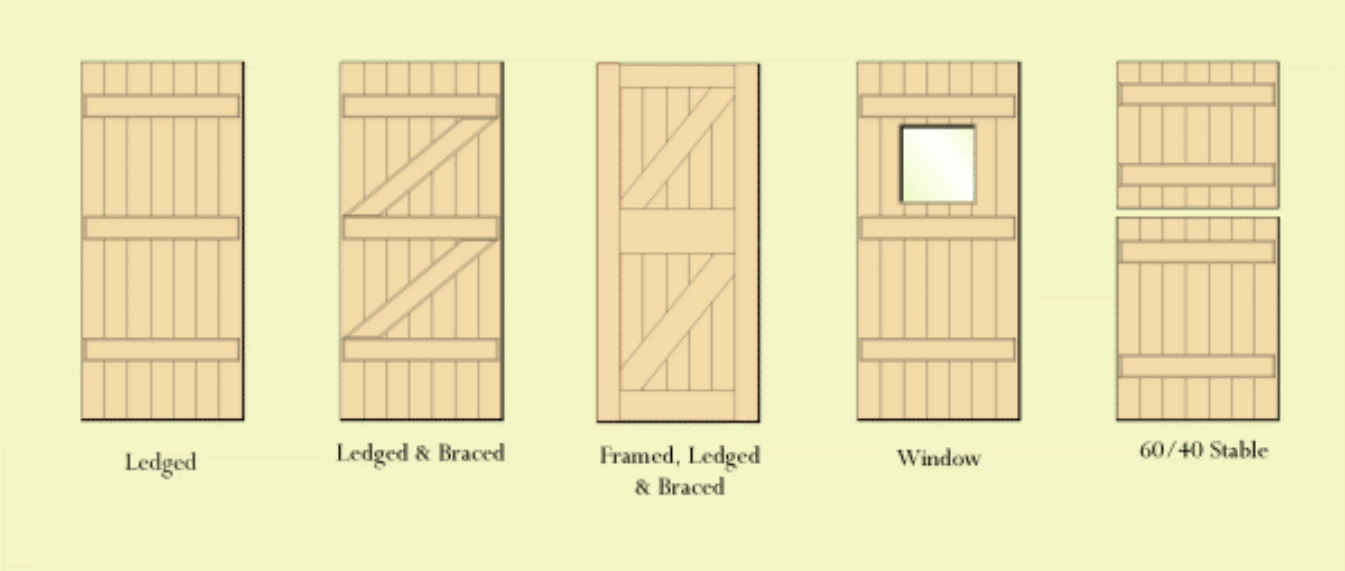
.4 Sticking: a planed moulding with a groove or a rabbet that holds a panel or window pane in place.

.5 Batten door: a door formed of full height boards glued edge to edge with horizontal and vertical battens applied. A double batten door has battens on both sides.

.6 Ledged door: a door with horizontal boards (ledges) used as cleats to fasten the vertical boards.

.7 Ledged & Braced door: a door with horizontal boards (ledges) used as cleats to fasten the vertical boards, and diagonal boards (braces) that support both the vertical boards and horizontal boards.

.8 Framed, Ledged & Braced door: similar to a Ledged & Braced door, except that one or two vertical board may be added at latch side and/or hinge side to additionally reinforce vertical, horizontal and diagonal boards.



.9 Haunched mortise and tenon: the tenon is narrower at the tip than the root.

.10 Run through: the tenon is allowed to run through the mortised member for wedging.

.11 Wedged: a wood wedge used in a dovetail-shaped mortise to secure a tenon.

.12 Draw-bore pin: a tapered wood peg used to fasten a mortise and tenon joint.

.13 Blind mortise: a mortise joint in which the tenon is entirely surrounded by wood.

.14 Stub tenon: a short tenon used in a closed mortise joint.

.15 Dowelled door: a wood door with rails and stiles fastened with dowels rather than tenons.

.16 Tongued: a projecting portion of a member, such as a tenon.

.17 Half-lapped: a lap joint in which a rectangular notch in the end of one wood member overlaps a corresponding rectangular notch in the end of another wood member.

.18 Stop chamfered: a corner chamfer that does not extend to the end of the timber or moulding; typically terminated with a small, triangular plane surface.

1.05 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Shop Drawings:
- .1 Submit shop drawings.
- .2 Indicate details of construction, profiles, jointing, fastening and other related details.
- .3 Indicate materials, thicknesses, finishes and hardware.
- .4 Indicate locations, sizes, and types of all doors to be supplied.

.3 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Submit 2 samples of each type of door hardware.

1.06 QUALITY ASSURANCE

.1 Permit Departmental Representative to inspect period wood door fabrication shop during fabrication at Departmental Representative’s sole discretion; Departmental Representative will provide 72 hours notice of inspection.

.2 Fabricate doors in accordance with the AWMAC/AWI Architectural Woodwork Standards, Section 9 - Doors, Premium grade.

1.07 QUALIFICATIONS

.1 Provide corporate or individual resumes for proposed contractor and workers.

.2 Carry out door fabrication work using skilled tradesperson trained and experienced in fabrication and installation of wood doors.

.3 Provide documentation stating shop foreperson and personnel are of recognized standing in the industry, with a proven record of satisfactory door fabrication and installation over five years. Obtain Departmental Representative's approval of this standing.

.4 Door fabricators: experienced in use of materials. Supply job references showing door fabrication experience of similar size and scope as this project.

.5 Competent worker: equipped with tools and equipment necessary to carry out work in a traditional manner.

.6 Contractor's Field Supervision and Crew Qualifications: maintain full-time supervisor/foreperson on job site during times work is in progress. Supervisor must have door fabrication training and have minimum five years experience in door fabrication similar in nature and scope to specified work.

.1 Shop crew makeup: trade qualified journeyperson carpenters and registered apprentices in the ratio of no more that one to one (at least one journeyperson to one apprentice).

.2 Submit crew qualifications for review by Departmental Representative.

1.08 DELIVERY, STORAGE AND HANDLING

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

.2 Store or hang doors in enclosed space with controlled ambient temperature and relative humidity.

.3 Seal newly exposed surfaces after fitting and cutting for hardware with two coats of paint.

.4 Store and handle doors and panels in accordance with AWMAC requirements, and as follows:

.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.
.2 Store doors in well-ventilated room, off floor, in accordance with manufacturer's recommendations.
.3 Protect doors from scratches, handling marks and other damage.
.4 Store doors away from direct sunlight.

1.09 WARRANTY

.1 Provide warranty stating that doors are warranted against defects in materials and workmanship for the life of the original installation.

.2 Warranty to include coverage for reasonable amount to remove, replace, refinish, and re-hang doors that do not meet accepted AWMAC tolerances.

2 PRODUCTS

2.01 MATERIALS

.1 Tongue and Groove: rough cut Eastern White Pine, to CAN/CSA O141: graded and stamped in accordance with National Lumber Grading Association (NLGA) Standard Grading Rules for Canadian Lumber, and as follows:
.1 Grade: No. 2 grade or better.
.2 Appearance: Clear Vertical Grain Heart.
.3 Texture: rough cut.
.4 Kiln dried and steam conditioned to 10-12% MC.
.5 Tongue & Groove edges, jointed as indicated.
.6 Sizes: 19 x 140 mm, and as indicated.

.2 Softwood lumber (planks, boards, etc.): Eastern White Pine, Grade No. 1 or better, S4S, kiln dried, moisture content 12% or less in accordance with following standards:
.1 CSA O141.
.2 Rough sawn.
.3 Sizes: 19 x 140 mm, and as indicated.
.4 NLGA Standard Grading Rules for Canadian Lumber.
.5 AWMAC premium grade, moisture content as specified.

.3 Sizes: in accordance with reviewed shop drawings, and to suit rough openings, and general design intent to match adjacent exiting door construction and appearance for each new type required. Refer to Drawings.

.4 Fasteners: nails, wood screws, wood pegs, wood pins, wood glues.

.5 Hardware (match hardware found at adjacent existing similar doors at barn as closely as possible for conditions, function and use):
- .1 Hinges: match existing on-site.
- .2 Door pulls: match existing on-site.
- .3 Latches: match existing on-site.
- .4 Overhead hardware for sliding barn doors: Submit cut sheets for initial selection by Departmental Representative. General design concept as indicated, pre-manufactured exterior barn door box track roller assembly, with all accessories, stops, fasteners, bolts, etc., as required for a complete installation.

2.02 FABRICATION

.1 Vertical, horizontal and diagonal boards to be one piece solid stock.

.2 Mouldings on frame members specified as solid to be run in solid stock and not simulated with an applied moulding. Square exposed edges.

.3 Allow 1 mm clearance around panel edges.

.4 Ledged and Braced Door:
- .1 Sliding Barn Door: 3-ledges with 2-diagonal braces.
- .2 Material: Boards, ledges and braces to be No.1 kiln dried Eastern White Pine lumber.
- .3 Boards: tongue and groove rough sawn boards run vertically.
- .4 Joints: mortise and tenon joints, glued with waterproof carpenter’s glue, exterior grade.
- .5 Ledges: finished with square exposed edges.
- .6 Diagonal Braces: let into ledges, finished with square edges.
- .7 Fastening: through-bolted to match on-site existing, set out to match on-site existing large swing barn door.

.8 Steel plate bracing at junction of diagonal boards and ledges: 1/8-inch black steel plate to Section 05 50 00 – Metal Fabrications, pre-drilled holes for through bolts, shop-primed. Steel plate shape and proportion to match existing barn door plates, custom-fabricated to suit new sliding barn door construction.

.5 Framed, Ledged and Braced Door:
.1 Swing Door: 3-ledges with 2-diagonal braces and 1-vertical frame member at latch side.
.2 Material: Boards, ledges, braces and vertical frame board to be No.1 kiln dried Eastern White Pine lumber.
.1 Moisture content of components to be from six to twelve percent. Dowels to be Douglas fir.
.3 Boards: tongue and groove rough sawn boards run vertically.
.4 Joints: mortise and tenon joints, glued with waterproof carpenter’s glue, exterior grade.
.5 Ledges: finished with square exposed edges.
.6 Diagonal Braces: let into ledges and latch-side frame, finished with square edges.
.7 Frame board: finished with square exposed edges.
.8 Fastening: through-bolted to match on-site existing, set out to match on-site existing large swing barn door.

.6 Door frames: solid No.1 kiln dried Eastern White Pine lumber, framed opening to match construction of existing on-site door and frame at barn, primed and painted.

.7 Dry fit and assemble door components before completing fabrication. Shop fabricate and paint to extent possible before bringing to site.

.8 Fabricate doors and frames in accordance with AWMAC premium grade.

2.03 FINISHING

.1 Factory-finish doors in accordance with AWMAC Section 5 – Finishing, System 9; opaque semi-gloss, colour as selected by Departmental representative.

3 EXECUTION

3.01 INSTALLATION

.1 Comply with manufacturer's printed installation instructions, data sheets, standard details, and specifications

.2 Coordinate with other trades as required for a complete installation. Refer to notes on Drawings.

.3 Install doors and hardware in accordance with manufacturer's printed instructions and AWMAC premium standards.

.4 Sizing for height: match proportions, orientation and placement of existing, to suit new openings, function and whether sliding or swing action.

.5 Sizing for width swing door: door width to be distance between jamb lining or frame members less 3 mm play.

.6 Sliding barn door to overlap opening height and width by full width of frame, plus ¼-inch each way.

.7 Lock-edge bevel: bevel lock-edge of door 3 mm.

.8 Hinge location as indicated in shop drawings, flush mounted. Match exiting to extent possible.

.9 Mounting height of hardware to match existing.

.10 Install hardware in accordance with instructions given on shop drawings, manufacturer’s instructions and Drawings.

.11 Adjust hardware for correct function.

.12 Install planted stops.

3.02 ADJUSTING

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

3.03 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

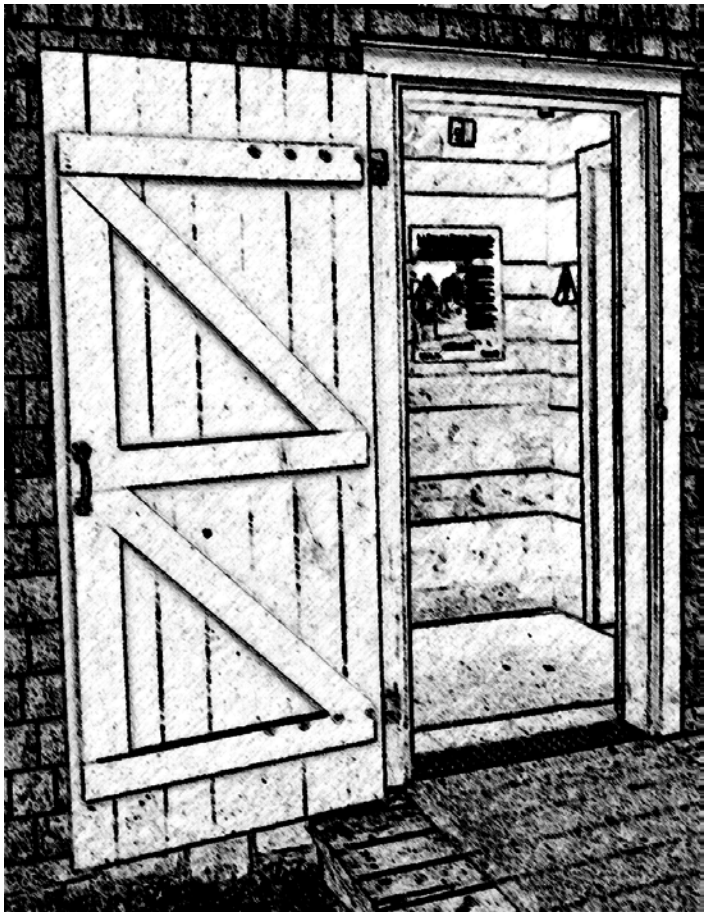
.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.04 PROTECTION

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

.2 Repair damage to adjacent materials caused by rough carpentry installation.

END OF SECTION



1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 06 10 00 – Rough Carpentry.

.2 Section 06 17 00 – shop Fabricated Timber Framing.

.3 Section 06 12 10 – Structural Insulated Panels.

.4 Section 07 21 19 – Foamed-in-Place Insulation.

.5 Section 07 27 00.01 – Air Barriers and Vapour Retarders.

.6 Section 07 92 00 – Joint Sealants.

.7 Section 08 80 50 – Glazing.

.8 Section 09 21 16 - Gypsum Board Assemblies.

.9 Section 09 91 00 - Painting.

1.02 REFERENCES

.1 American National Standards Organization (ANSI) / Steel Door Institute (SDI)
- .1 ANSI/SDI A250.3-2007 (R2011), Test Procedure and Acceptance Criteria for Factory Applied Finish Coatings for Steel Doors and Frames.
- .2 ANSI/SDI A250.8-2003 (R2008), Recommended Specifications for Standard Steel Doors and Frames.
- .3 ANSI/SDI A250.10-1998 (R2011), Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.

.2 American Society for Testing and Materials International (ASTM)
- .1 ASTM A653/A653M 11, Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc Iron Alloy Coated (Galvannealed) by the Hot Dip Process.
- .2 ASTM A780/A780M-09, Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings.
- .3 ASTM A879/A879M-12, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

.4 ASTM A924 / A924M-13, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
.5 ASTM B29 03(2009), Standard Specification for Refined Lead.
.6 ASTM B749 03(2009), Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
.7 ASTM C553-11, Specification for Mineral Fiber Blanket Insulation for Commercial and Industrial Applications
.8 ASTM C578-12b, Specification for Rigid, Cellular Polystyrene Thermal Insulation
.9 ASTM C591-12b, Specification for Un-Faced Pre-formed Rigid Cellular Polyisocyanurate Thermal Insulation
.10 ASTM C592-12, Specification for Mineral Fiber Blanket Insulation and Blanket-Type Pipe Insulation (Metal-Mesh Covered) (Industrial Type)
.11 ASTM C1289-13e1, Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
.12 ASTM D1622-08, Standard Test Method for Apparent Density of Rigid Cellular Plastics.
.13 ASTM D4726-09, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Exterior-Profile Extrusions Used for Assembled Windows and Doors.
.14 ASTM D6386-10, Standard Practice for Preparation of Zinc (Hot Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting.
.15 ASTM D7396-08, Standard Guide for Preparation of New, Continuous Zinc-Coated (Galvanized) Steel Surfaces for Painting.

.3 CSA International
.1 CAN4 S106-M80, Standard Method for Fire Tests of Window and Glass Block Assemblies
.2 CSA G40.20/G40.21 04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.3 CSA W47.1-09, Certification of companies for fusion welding of steel, Includes Update No. 3 (2011), Update No. 5 (2012).
.4 CSA W59 03 (R2008), Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door Manufacturers' Association (CSDMA)
.1 CSDMA, Guide Specification for Installation and Storage of Hollow Metal Doors and Frames, 2012.
.2 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, 2006.

.3 CSDMA, Selection and Usage Guide for Commercial Steel Doors, 2009.

.5 National Fire Protection Association (NFPA)
.1 NFPA (Fire) 80, Standard for Fire Doors and Other Opening Protectives, 2013 Edition.
.2 NFPA (Fire) 252, Fire Tests of Door Assemblies, 2012 Edition.

.6 Underwriters' Laboratories of Canada (ULC)
.1 CAN/ULC S104-10, Standard Method for Fire Tests of Door Assemblies.
.2 CAN/ULC S105 09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC S104.
.3 CAN/ULC S701 11, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
.4 CAN/ULC S702 09-AM1, Standard for Thermal Insulation Mineral Fibre for Buildings, Includes Amendment 1 (January 2012).
.5 CAN/ULC S704 11, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.03 SYSTEM DESCRIPTION

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

1.04 ACTION AND INFORMATIONAL SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheets for each type of door and frame specified.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia, Canada.

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

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

.4 Samples:

.1 Submit one 300 x 300 mm corner sample of each type of frame. Show butt cutout and glazing stops.

1.05 DELIVERY, STORAGE AND HANDLING

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

.2 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

2 PRODUCTS

2.01 PERFORMANCE AND DESIGN REQUIREMENTS

.1 Perform work in accordance with CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, except as otherwise specified herein.

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

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

.4 Steel fire rated doors and frames: Label and list fire rated doors and frames by an organization accredited by the Standards Council of Canada in conformance with CAN/ULC S104 and CAN/ULC S105 for ratings specified or indicated. Fire labels must be factory applied by the manufacturer.

.5 Be responsible for securing approval from Departmental Representative, and authorities having jurisdiction for materials, fabrication and installation of fire rated oversized door and frame assemblies.

2.02 MATERIALS

.1 Steel:
- .1 Interior Doors and Frames: coated steel sheets to ASTM A924/M924; coating designation to ASTM A653/A653M: Commercial Steel (CS), Type B, ZF180; stretcher levelled.
- .2 Exterior Doors and Frames and Interior High Humidity Area: coated steel sheets to ASTM A924/M924; coating designation to ASTM A653/A653M: Commercial Steel (CS), Type B, Z275 hot dip galvanized; stretcher levelled.

.2 Nominal Base Metal Thickness Requirements:
- .1 Frames: refer to frame fabrication requirements specified in this section.
- .2 Doors: refer to door fabrication requirements specified in this section.
- .3 Hardware Reinforcement for Doors and Frames: Carbon steel, welded in place, prime painted, to the following minimum nominal thicknesses:

Hardware Reinforcement	Door (mm)	Frame (mm)
Pivot Hinge:	4.20	4.20
Mortise Hinge:	3.51	3.51
Mortise or Bored Lock or Deadbolt:	1.98	1.98
Flush or Surface Bolt Front:	1.98	1.98
Surface or Concealed Closer:	2.74	2.74
Strike Reinforcements:	1.98	1.98
Hold Open Arm:	1.98	1.98
Electronic Hardware Reinforcements:	1.98	1.98
Pull Plates and Bars:	1.30	1.30
Mortar Box:	--	0.84
Surface Exit Devices:	1.98	1.98
Door Surface Hardware Reinforcements:	1.30	1.30
Frame surface hardware reinforcements:	2.74	2.74

2.03 DOOR CORE MATERIALS

.1 Door Core Materials:
- .1 Honeycomb: Structural small cell 25 mm maximum. kraft paper honeycomb:
  - .1 Weight: 36.3 kg/ream minimum.
  - .2 Density: 16.5 kg/m3 minimum.
  - .3 Sanded to required thickness.
- .2 Polystyrene: Rigid extruded, closed cell insulation, fire retardant treated meeting the requirements of ULC S701, Type 4, minimum thermal resistance RSI 0.8/25 mm thickness.
- .3 Temperature Rise Rated (TRR): core composition shall provide the fire-protection rating and limit the temperature rise on the unexposed side of door at 250oC for 30 or 60 minutes as determined by National Building Code of Canada, 2010. Core shall be tested as part of a complete door assembly in accordance with CAN/ULC S104 covering the Standard Method of Tests of Door Assemblies and shall be listed by a nationally recognized testing agency having a factory inspection service.

2.04 ADHESIVES

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

.2 Polystyrene cores: heat resistant, epoxy resin based, low viscosity, contact cement.

.3 Interlocking Edge Seam Adhesive: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.05 PRIMER

.1 Touch up primer: Commercial rust inhibitive primer, shop prime coat doors and frames before delivery; grey or red coloured primer; in accordance with Section 09 91 00 - Painting. Clear primer not acceptable; provide primer for field touch-up.

2.06 PAINT

.1 Field paint steel doors and frames in accordance with Section 09 91 00. Protect weatherstrips from paint. Provide final finish free of scratches or other blemishes. Finish colours selected by Departmental Representative.

2.07 ACCESSORIES

.1 Door silencers (bumpers): Black neoprene, to ANSI/BHMA A156.16 Type 6-180; three silencers on strike jambs of single door frames; two silencers on heads of double door frames; screw fastener applied. Stick on bumpers are not acceptable.

.2 Exterior top and bottom caps: factory-installed PVC; flash at top, recessed at bottom.

.3 Interior top caps: rigid polyvinylchloride extrusion, to ASTM D4726.

.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 Make provisions for glazing as indicated and provide necessary glazing stops.
.1 Provide removable glazing beads.
.2 Design exterior glazing stops to be tamperproof.

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

.7 Fasteners: type 304 stainless steel screws with countersunk flat head.

.8 Labels for fire doors and door frame: brass plate, riveted to door and door frame.

.9 Sealants: to Section 07 92 00.

2.08 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

.2 Accurately form frames to profiles indicated. Construct frames straight and free from twist or warp.

.3 Exterior frames: 1.98 mm minimum welded construction. 50 mm face standard frame profile, throat and frame width to suit wall construction.

.4 Interior frames: 1.6 mm minimum for single doors; 1.98 mm for frames with opening width in excess of 1220 mm; welded type construction; 50 mm face standard frame profile, throat and frame width to suit wall construction.

.5 Blank, drill, reinforce and tap frames to receive mortised, templated hardware, security and electrical devices, using templates provided by finish hardware supplier. Reinforce frames for installation of closers. Install stiffener plates or two angle spreaders where required to prevent bending of frame and to maintain alignment when setting. Weld reinforcement in place.

.6 Protect mortised cutouts with steel guard boxes where required (masonry/concrete construction).

.7 Provide three resilient bumpers per single door at the strike jamb. Provide two resilient bumpers per door leaf at the head of double doors.

.8 Conceal fastenings except where exposed fastenings are indicated.

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

.10 Provide fire labelled frames for those openings requiring fire protection ratings, as indicated in as scheduled on Drawings.

2.09 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

.2 Where frames terminate at finished floor, supply floor plates for anchorage to slab. Check depth of extension of finished floor to structural slab and provide jamb extension anchorage as required. Provide 50 mm minimum adjustment

.3 Locate wall anchors immediately above or below each hinge reinforcement on the hinge jamb, and directly opposite on the strike jamb. Provide three anchors per jamb for frames up to 2300 mm. Add one anchor per jamb for each additional 760 mm or fraction thereof in frame height.

.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 on centre maximum.

2.10 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

.2 Cut frame mitres accurately and weld on inside of frame profile. Fill frame corners, exposed surface depressions and butted joints with air drying paste filler. Sand to a smooth uniform finish. Touch up damaged galvanized finish with zinc rich primer.

.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 Insulate exterior frame components with polyurethane insulation as indicated in Section 07 21 19.

2.11 FRAMES: KNOCKDOWN TYPE (ROOM D103 ONLY)

.1 Ship knocked down type frames unassembled.

.2 Fully assemble prior to installation.

.3 Provide frames with mechanical joints which inter lock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Recommended Installation Guide for Steel Doors and Frames.

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

2.12 DOOR FABRICATION GENERAL

.1 Fabricate steel doors rigid, neat in appearance, and free from defects including warp and buckle; 45 mm thickness of types and sizes indicated on drawing, and as follows:
- .1 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.
- .2 Form edges true and straight with minimum radius suitable for thickness of steel used.
- .3 Bevel lock and hinge edges 3 mm in 50 mm; confirm requirement with builder’s hardware or door swing that could dictate a different bevel.
- .4 Top and bottom of doors shall be provided with inverted, recessed, nominal 1.60 mm steel end channels welded to each face sheet at 150 mm on centre.
- .5 Equip exterior doors with factory installed flush PVC top caps. Equip fire labelled exterior doors with factory installed flush steel top caps.
- .6 Provide fire labelled doors for those openings requiring fire protection ratings and temperature rise ratings.
- .7 Fabricate doors with the following clearances:
  - .1 Clearance between door and frame and between meeting edges of doors swinging in pairs shall not exceed 3 mm.
  - .2 Clearance between the bottom of door and floor shall not exceed 19 mm or as required to accommodate specified hardware.
  - .3 Clearance between bottom of door and a raised non combustible sill in accordance with NFPA 80.

.4 Clearance between bottom of door and nominal surface of combustible floor coverings in accordance with NFPA 80.

.2 Fabricate doors with longitudinal edges locked seamed, adhesive assisted. Seams: not visible, grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish. Bevel both stiles of single doors 1 in 16.

.3 Exterior Doors: Flush, lock seam construction, insulated doors fabricated in accordance with CAN/CGSB 82.5, and as follows:
.1 Face Sheets: Minimum 1.60 mm base steel sheet thickness.
.2 Insulation Stiffened Core: Insulated and sound deadened with polystyrene or polyisocyanurate at choice of manufacturer, core laminated under pressure to each face sheet.

.4 Interior Doors: Flush, lock seam construction, hollow steel doors fabricated in accordance with CSDMA Manufacturing Specifications for Doors and Frames, and as follows:
.1 Face sheets: Minimum 1.30 mm base steel sheet thickness.
.2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet.

.5 Fire Rated Doors: Flush, lock seam construction, hollow steel doors fabricated in accordance with CAN4 S104 and NFPA 80, and as follows:
.1 Face sheets: Minimum nominal 1.60 mm base steel sheet thickness.
.2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet, or Stiffened, insulated and sound deadened with manufacturer’s proprietary Temperature Rise Rated (TRR) core material, as required by NBC.
.3 Equip pairs of fire labelled doors with minimum 2.74 mm steel surface mounted flat bar astragal, welded to door face; plug welded on face and stitch welded to butt edge of door.
.4 Labelled by Underwriters Laboratories of Canada, ITS/Warnock Hersey, or other testing laboratory approved by the authority having jurisdiction.

.6 Oversized Doors: Flush, welded construction, hollow steel door fabricated in accordance with CSDMA Manufacturing Specifications for Doors and Frames, and as follows:
.1 Face sheets: Minimum base steel sheet thickness as recommended by manufacturer to achieve required stiffness.
.2 Internally steel stiffened with continuous vertical steel stiffeners at 150 mm on centre, continuous welded to both face sheets; fill voids with glass fibre insulation.
.3 Fabricate doors as a single unit; multiple door units scabbed together will not be considered as an acceptable assembly.
.4 Blank, reinforce and mortise doors for factory installed three-point latching system; provide additional reinforcing for oversize doors in accordance with manufacturer’s recommendations.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

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

3.02 INSTALLATION GENERAL

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

.2 Install doors and frames to CSDMA Installation Guide.

3.03 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.

3.04 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, finished floor and thresholds as follows.
.1 Hinge side: 1.0 mm.
.2 Latch side and head: 1.5 mm.
.3 Finished floor, non-combustible sills and thresholds: 6 mm.

.3 Adjust operable parts for correct function.

3.05 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.

3.06 FIELD PAINTING

.1 Prepare surfaces for field painting to ASTM D6386 and ASTM D7396.

.2 Field painting: refer to Section 09 91 00. Protect weather strips from paint. Provide final finish, free of scratches or other blemishes.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 06 20 00 – Finish Carpentry.

.2 Section 08 11 00 - Metal Doors and Frames.

.3 Section 08 71 00 – Door Hardware.

1.2 REFERENCES

.1 American National Standards Institute (ANSI)

.1 ANSI A208.1-2009, Particleboard.

.2 Architectural Woodwork Manufacturers Association of Canada (AWMAC)

.1 AWMAC/AWI Architectural Woodwork Standards, 2nd Edition, 2014.

.3 Canadian Hardwood Plywood and Veneer Association (CHPVA)

.1 CHPA Official Grading Rules for Rotary Cut Face Veneers.

.4 Canadian Standards Association (CSA International)

.1 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.

.2 CAN/CSA O132.2 Series-90 (R1998), Wood Flush Doors.

.5 National Lumber Grades Authority (NLGA)

.1 Standard Grading Rules for Canadian Lumber 2014.

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 Shop Drawings:

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

.2 Indicate door types and cutouts for lights and louvres, sizes, core construction, transom panel construction and cutouts.

1.4 SAMPLES

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

.2 Submit one 300 x 300 mm sample of each type wood door finish.

.3 Show door construction, core, glazing detail and faces.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

1.5 AESTHETIC CRITERIA

.1 Wood doors along a corridor or within a room shall be Set Matched; pairs of doors, Pair Matched.

.2 Veneer Leaves shall be Slip Matched.

.3 Trim and moulding shall be selected for continuity and uniformity of finished appearance, AWMAC premium grade, meeting Blueprint Matching criteria.

1.6 QUALITY ASSURANCE

.1 Fabricate doors in accordance with the AWMAC/AWI Architectural Woodwork Standards, Section 9 - Doors, Premium grade.

.2 Manufacturer Qualification: Manufacturer specializing in products in this section who have a minimum of five years of documented experience and are a member in good standing of the Architectural Woodwork Manufacturers Association of Canada (AWMAC).

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

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

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver doors and panels to minimize storage on site and when site conditions conform to requirements for storage.

.2 Storage and Protection:

.1 Store and handle doors and panels in accordance with AWMAC requirements, and as follows:

.1 Protect doors from dampness. Arrange for delivery after work causing abnormal humidity has been completed.

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

.3 Protect doors from scratches, handling marks and other damage.

.4 Store doors away from direct sunlight.

1.8 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Demolition Waste Management and Disposal.

1.9 WARRANTY

.1 Provide warranty issued in the name of the Owner stating that doors are warranted against defects in materials and workmanship for the life of the original installation.

.2 Warranty to include coverage for reasonable amount to remove, replace, refinish, and re-hang doors that do not meet accepted AWMAC tolerances.

Part 2 Products

2.1 SOLID CORE DOORS

.1 Flush wood doors: solid core to AWMAC Standard, premium grade.

.2 Dry lumber to an average moisture content of between 6 and 12% maximum at time of manufacture.

.3 Construction:

.1 Solid particleboard core having minimum density of 449 kg/m^3 in accordance with ANSI A208.1 and as follows:

.1 Stiles and Rails: Structural Composite Lumber (SCL) bonded to core and as follows:

.1 Side Stiles: 108 mm SCL with 16 mm hardwood edge, to match face veneers; no finger jointed materials permitted.

.2 Top and Bottom Rails: 57 mm SCL with 16 mm soft wood cap.

.2 Reinforcement: with solid wood lock-blocks.

.3 Construction: 5-ply.

.4 Use: interior.

.2 Door cores to be fully bonded and abrasive planed or sanded prior to laminating faces to core materials.

.3 Door Thickness: 45 mm overall.

.4 Hardboard: Meeting CAN/CGSB-11.3, Type 2, minimum density 500 kg/m^3, 6 mm nominal thickness one face smooth finish suitable for painted finish.

.5 Adhesive: Type I (waterproof)

.6 Metal Door Frames: Refer to Section 08 11 10 – Steel Doors and Frames and/or Section 06 20 00 - Finish Carpentry, as indicated.

2.2 FABRICATION

.1 Fabricate doors in accordance with AWMAC section 9.

.2 Vertical edge strips to match face veneer.

.3 Doors shall be pre-fitted, bevelled and machined at the factory for all mortise hardware items as per templates and approved hardware schedules provided.

.4 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.

2.3 FINISHES

.1 Factory-finish doors: to AWMAC Premium Grade for opaque finishes, alkyd semi-gloss three-coat system.

.2 Factory-seal top and bottom of door edges.

.3 Provide materials for touch-up of finishes.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's printed installation instructions, data sheets, standard details, and specifications.

3.2 INSTALLATION

.1 Unwrap and protect doors in accordance with AWMAC.

.2 Coordinate with the work of Section 08 11 00 – Metal Doors and Frames.

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

.4 Adjust hardware for correct function.

3.3 ADJUSTMENT

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

3.4 CLOSEOUT ACTIVITIES

.1 Deficient Work:

.1 Replace, rework or refinish work that does not meet AWS Manual requirements as directed by Departmental Representative.

.2 Adjusting and Cleaning:

.1 Readjust doors and hardware just prior to completion of building to function freely and properly and as follows:

.1 Re-hang or replace doors that do not swing or operate freely.

.2 Replace doors that are damaged or that do not comply with requirements of this Section; doors may be repaired or refinished where work complies with requirements and shows no evidence of repair or refinishing in completed work.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 06 12 10 - Structural Insulated Panels.

.3 Section 06 20 00 - Finish Carpentry.

.4 Section 07 31 29.10 - Wood Shingle Siding and Roofing.

.5 Section 07 62 00 - Sheet Metal Flashing and Trim.

.6 Section 07 92 00 - Joint Sealants.

.7 Section 08 52 13.10 - Aluminum-Clad Windows.

.8 Section 08 80 50 – Glazing.

1.02 REFERENCE STANDARDS

.1 American Architectural Manufacturers Association/Window and Door Manufacturers Association (AAMA/WDMA), American National Standards Institute/Window and Door Manufacturers Association (ANSI/WDMA)
  .1 AAMA 1503-09, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  .2 AAMA 1503.1-88, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  .3 AAMA 2605-11, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  .4 WDMA I.S.4-07, Water Repellant Preservative Treatment for Millwork.

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

.3 ASTM International
  .1 ASTM A167-99(R2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

.2 ASTM A480/480M-09b, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
.3 ASTM C1036-11e1, Standard Specification for Flat Glass.
.4 ASTM E283-04(2012), Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
.5 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
.6 ASTM E547-00(2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
.7 ASTM E1996-14a, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
.8 ASTM E1886-13a, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
.9 ASTM E2190-10 Standard Specification for Insulating Glass Unit Performance and Evaluation.

.4 Canadian Standards Association (CSA International)
.1 CSA A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights, Includes Update No. 1 (2014).
.2 CSA A440.2-14/A440.3-14, Fenestration energy performance/User guide to CSA A440.2-14.
.3 CAN/CSA A440.4-07(R2012) - Window, Door, and Skylight Installation.
.4 CSA Certification Program for Windows and Doors 2000.

.5 Health Canada / Workplace Hazardous Materials Information System (WHMIS)
.1 Material Safety Data Sheets (MSDS).

.6 South Coast Air Quality Management District (SCAQMD), California State, Regulation XI. Source Specific Standards
.1 SCAQMD Rule 1113-A2007, Architectural Coatings.
.2 SCAQMD Rule 1168-A2005, Adhesives and Sealants Applications.

.7 Window and Door Manufacturer's Association (WDMA)
.1 WDMA I.S. 4-15A, Industry Specification for Preservative Treatment for Millwork.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for door materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Submit shop drawings including plans, elevations, large-scale sections and details, hardware, attachments to other work, operational clearances, and the following:
.1 Sections details showing all window perimeter conditions.
.2 Sash frame details and corner connections, including reinforcement and stiffeners.
.3 Joinery and frame anchorage to wall structure details.
.4 Expansion provisions.
.5 Flashing and drainage details, sill flashing terminations, in isometric view, including coordination with wall cladding materials.
.6 Connection to air and vapour retarder membrane
.7 Weather stripping details showing air sealing within and around perimeter of framing and operable sash
.8 Glazing details.
.9 Required sizes and tolerances of openings.

.4 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be returned for inclusion into work.

.5 Test Reports: Submit product test reports indicating compliance with CSA A440 based on evaluation of comprehensive tests performed within the last four years by a qualified testing agency, for each type, grade, and size of window indicated for the project; test results based on use of down sized test units will not be accepted.

1.04 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for door closers, locksets and door holders for incorporation into manual.

.3 Tools: supply 2 sets of wrenches for door closers and locksets.

1.05 DESIGN CRITERIA

.1 Meet or exceed the following minimum design and performance criteria:

Product	Air Tested to psf	Water Tested to psf	Structural Tested to psf	CSA A440 Performance Grade	Design Pressure (DP)	Overall Width		Overall Height		# of Panels
						in	mm	in	mm	
Aluminum Clad Outswing Bi-Fold Door	1.57	4.59	45	SP-PG30	30	143 5/16	(3640)	97 1/8	(2467)	4

.2 Submit data sheets and test results in same format and table headings demonstrating compliance with these requirements.

1.06 QUALITY ASSURANCE

.1 Single-Source Responsibility: obtain all aluminum-clad wood doors and windows from a single manufacturer regularly engaged in the manufacturing and supply of the specified products, meeting or exceeding the material properties and performance characteristics of the materials specified in this Section.

.1 Coordinate with Section 08 52 13.10 - Aluminum-Clad Windows in order to develop an integrated delivery and installation schedule and strategy.

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

1.07 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:
- .1 Store materials off ground in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect bi-fold doors from all or any damage.
- .3 Replace defective or damaged materials with new.

1.08 WARRANTY

.1 Provide manufacturer’s standard warranty coverage as follows (commencing from date of completed installation on site):
- .1 Glazing (seal failure 20-years; stress cracks 10-years).
- .2 Cladding finish (20-years).
- .3 Interior finish (5-years).
- .4 Hardware (10-years).

2 PRODUCTS

2.01 MANUFACTURED UNITS

.1 Description: aluminum-clad outswing doors and frames, complete with raised/flat panel option, hardware, glazing, weather strip, trim, attachments, and accessories.
- .1 4 outswing panels.
- .2 Panel Operation: 3 left and 1 right.

2.02 FRAME DESCRIPTION

.1 Interior: Non-finger-jointed Eastern White Pine.
- .1 Kiln-dried to moisture content no greater than twelve 12 percent at time of fabrication.
- .2 Water-repellant preservative treated to WDMA I.S.4..

.2 Frame exterior aluminum clad with 1.3 mm thick extruded aluminum.

.3 Jamb depth: 5 ½" (25 mm), with skid plate applied.

.4 Interior frame thickness: 1-inch (25 mm).

.5 Flat bottom sill with guide channel and weep system:
1. ADA lowrise aluminum sill: 6 9/16" (167 mm) wide x 15/16" (24 mm) high.

2.03 PANEL DESCRIPTION

.1 Interior: Non-finger-jointed Eastern White Pine.
.1 Kiln-dried to moisture content no greater than twelve 12 percent at time of fabrication.
.2 Water-repellant preservative treated to WDMA I.S.4..

.2 Sash exterior aluminum clad with 1.3 mm thick extruded aluminum, anodized bronze as selected by Departmental Representative from manufacturer's standard range.

.3 Panel thickness: 1¾" (44 mm).

.4 Top rail height and stile width: 4 ¾" (121 mm).

.5 Door bottom rail height: 8-1/8" (206).

.6 Panel corners glued and fastened with 5/8" x 4 inch (16mm by 102mm) fluted hardwood dowels. Removable interior vinyl glazing stops with non-finger-jointed wood covers. No visible fasteners.

2.04 GLAZING

.1 Glass and glazing: to Section 08 80 50 – Glazing; factory-installed.

.2 Standard interior wood cope sticking: Ogee.

.3 Glazing Seal: Silicone bedding exterior.

2.05 FINISH

.1 Exterior: Aluminum Clad. Fluoropolymer modified acrylic topcoat applied over primer, meeting or exceeding AAMA 2605 requirements. Colour as selected by Departmental Representative from manufacturer's standard range; preference is a bronze colour, shade to be confirmed after review of colour submittals.

.2 Interior Finish: Factory-applied water-borne acrylic enamel clear coat. Applied in two separate coats with light sanding between coats.

2.06 HARDWARE

.1 Manufacturer's standard bi-fold door hardware system, suitable to panel operation.
- .1 Hinge set: 3 hinges per panel, powder coated PVD Bronze over a stainless steel substrate.
- .2 PVD Black Magnetic Door Catch Assemblies.
- .3 Contemporary Levers as selected by Departmental Representative from manufacturers' standard selections.
- .4 Multi-Point Lock on Active Panels: 2-3/8" (61 mm) backset with latch engagement, 3 locking points.
- .5 Drop bolts: 8" upper and lower drop bolts.
- .6 Oil Rubbed Bronze PVD Active Exterior Handle Set on Active Panel, Keyed. Coordinate with Section 08 71 00 - Door Hardware for keying requirements.
- .7 Oil Rubbed Bronze PVD Active Interior Handle Set on Active Panel.
- .8 Manufacturer's Clear Anodized Aluminum 6 9/16" ADA Sill.
- .9 Weather strip applied to all panel perimeter joints.
- .10 Panel cover weather strip: Top of panel, colour as selected by Departmental Representative from manufacturer's full range.
- .11 Panel pile weather strip: bottom of panel, grey colour.
- .12 Astragal weather strip, bronze colour.
- .13 Frame weather strip: Parameter of frame, bronze colour.

2.07 ACCESSORIES

.1 Aluminum Extrusions:
- .1 Profile: flat casing, frame expander, jamb extender, mullion cover, mullion expander, as required for a complete installation.
- .2 Finish: Match exterior frame finish.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for hinged safety glass doors installation in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Departmental Representative.
  .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied. Proceeding with work means acceptance of conditions.

3.02 INSTALLATION

.1 Assemble and install door units according to manufacturer’s printed installation instructions and reviewed shop drawings.

.2 Install sealant and related backing materials at perimeter of unit or assembly in accordance with Section 07 92 00 Joint Sealants. Do not use expansive foam sealant.

.3 Install accessory items as required.

.4 Use finish nails to apply wood trim and mouldings.

.5 Adjust operable parts for correct function and smooth operation.

.6 Adjust weatherstripping to ensure weathertight seal.

3.03 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.
  .2 Clean aluminum, stainless steel and bronze with damp rag and approved non-abrasive cleaner in accordance with manufacturer's instructions.
  .3 Remove traces of primer, caulking; clean doors and frames.
  .4 Clean glass and glazing materials with approved non-abrasive cleaner.
  .5 Polish hardware with non-abrasive cleaner and polish as recommended by and in accordance with manufacturer's written instructions.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.04 PROTECTION

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

.2 Repair damage to adjacent materials caused by hinged safety glass door installation.

END OF SECTION

1 GENERAL

1.01 RELATED SECTIONS

.1 Submittal Procedures: Section 01 33 00

.2 Contract Closeout: Section 01 78 00

.3 Common Product Requirements: Section 01 61 00

.4 Gypsum Board Assemblies: Section 09 21 16

.5 Duct Accessories: Section 23 33 00

.6 Plumbing Specialties and Accessories: Section 22 42 01

1.02 SHOP DRAWINGS

.1 Submit shop drawings in accordance with Section 01 33 00.

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

1.03 SAMPLES

.1 Submit samples in accordance with Section 01 33 00.

.2 Submit one (1) sample of each type of hand entry access door.

.3 Submit one 300 x 300 mm corner sample of each type of body entry door.

1.04 CLOSEOUT SUBMITTALS

.1 Provide maintenance data for cleaning and maintenance of stainless steel finishes for incorporation into manual specified in Section 01 78 00.

1.05 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00.

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

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

2 PRODUCTS

2.01 ACCESS DOORS

.1 Sizes: Except as indicated otherwise, to be minimum sizes as follows:
- .1 For body entry: 600 x 600 mm. (except 900 x 900mm for special location noted below)
- .2 For hand entry: 300 x 300 mm.
- .3 Access doors to be sized large enough to serve intended purpose.

.2 Construction:
- .1 Galvanized steel. Rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180. Provide fire-rated access doors where penetrating fire-rated construction.

.3 Materials
- .1 Tiled or marble surfaces and other special areas: Stainless steel with brushed satin or polished finish as directed by the Departmental Representative.
- .2 Other areas: galvanized steel.
- .3 Acceptable Manufacturers: Acudor; Buensod; Lettage; Zurn.

2.02 EXCLUSIONS

.1 Lay in tile ceilings: use unobtrusive identification locators.

3 EXECUTION

3.01 INSTALLATION

.1 Installation:
- .1 Drywall surfaces: to Section 09 21 16.
- .2 Where installed in fire separations, maintain fire rating integrity.

3.02 LOCATION

.1 Location: verify equipment is within view and accessible for operating, inspecting, adjusting, servicing without using special tools.

.2 Provide adequately sized galvanized steel access doors for all devices requiring inspection, maintenance or cleaning.

.3 Install access doors or panels wherever valves, water hammer arresters, plumbing cleanouts, trap primers, drain points, automatic and manual air vents, controllers, controlled devices, volume dampers, duct access doors and panels and where any equipment and system components requiring servicing, inspection or adjusting etc. are not accessible. Where equipment may be required to be removed for repair or servicing, adequate access must be provided.

.4 Special Location: none.

.5 Locate access doors before and after coils, filters, fans, automatic dampers, at fire dampers, fresh air and exhaust air plenums, bottoms of risers, and where required elsewhere.

.6 Remove lay-in tiles to obtain access to space above lay-in tile ceilings.

.7 Doors to open greater than 90 degrees, have concealed hangers, anchor straps and screwdriver cam locks.

.8 Doors in block walls or in tile shall be sized to suit masonry unit module.

.9 In fire rated walls and ceilings, access doors and panels must be fire rated.

.10 Provide stainless steel access doors for tile, marble or terrazzo surfaces.

.11 Access doors to be tight fitting with sealing gaskets and suitable quick fastening locking devices. Insulate access doors where they are installed in insulated ductwork or plenums.

.12 Gasketted panels (patches) minimum size 300mm x 300mm and fabricated from the same material as the duct and fastened with sheet metal screws are permitted if the access is for

cleaning only; otherwise access doors shall be provided.

.13 Interrupt duct coverings at all duct access doors to allow for easy opening.

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 06 12 10 - Structural Insulated Panels.

.3 Section 06 20 00 - Finish Carpentry.

.4 Section 07 31 29.10 - Wood Shingle Siding and Roofing.

.5 Section 07 62 00 - Sheet Metal Flashing and Trim.

.6 Section 07 92 00 - Joint Sealants.

.7 Section 08 14 76.10 - Aluminum-Clad Bi-Fold Doors.

.8 Section 08 80 50 – Glazing.

1.02 REFERENCE STANDARDS

.1 American Architectural Manufacturers Association/Window and Door Manufacturers Association (AAMA/WDMA), American National Standards Institute/Window and Door Manufacturers Association (ANSI/WDMA)
  .1 AAMA 1503-09, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  .2 AAMA 1503.1-88, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
  .3 AAMA 2605-11, Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  .4 WDMA I.S.4-07, Water Repellant Preservative Treatment for Millwork.

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

.3 ASTM International
  .1 ASTM A167-99(R2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

.2 ASTM A480/480M-09b, Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
.3 ASTM C1036-11e1, Standard Specification for Flat Glass.
.4 ASTM E283-04(2012), Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
.5 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
.6 ASTM E547-00(2016), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference.
.7 ASTM E1996-14a, Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes.
.8 ASTM E1886-13a, Standard Test Method for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Missile(s) and Exposed to Cyclic Pressure Differentials.
.9 ASTM E2190-10 Standard Specification for Insulating Glass Unit Performance and Evaluation.

.4 Canadian Standards Association (CSA International)
.1 CSA A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights, Includes Update No. 1 (2014).
.2 CSA A440.2-14/A440.3-14, Fenestration energy performance/User guide to CSA A440.2-14.
.3 CAN/CSA A440.4-07(R2012) - Window, Door, and Skylight Installation.
.4 CSA Certification Program for Windows and Doors 2000.

.5 Window and Door Manufacturer’s Association (WDMA)
.1 WDMA I.S. 4-15A, Industry Specification for Preservative Treatment for Millwork.

1.03 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:
- .1 Submit manufacturer's instructions, printed product literature and data sheets for window materials and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Submit shop drawings including plans, elevations, large-scale sections and details, attachments to other work, and the following:
- .1 Sections details showing all window perimeter conditions.
- .2 Frame details and corner connections, including reinforcement and stiffeners.
- .3 Joinery and frame anchorage to wall structure details.
- .4 Expansion provisions.
- .5 Flashing and drainage details, sill flashing terminations, in isometric view, including coordination with wall cladding materials.
- .6 Connection to air and vapour retarder membrane
- .7 Weather stripping details showing air sealing within and around perimeter of framing and operable sash
- .8 Glazing details.
- .9 Required sizes and tolerances of openings.

.4 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.

.5 Test Reports: Submit product test reports indicating compliance with CSA A440 based on evaluation of comprehensive tests performed within the last four years by a qualified testing agency, for each type, grade, and size of window indicated for the project; test results based on use of down sized test units will not be accepted.

1.04 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit maintenance data for window maintenance and replacement, including glass replacement, for incorporation into manual.

1.05 DESIGN CRITERIA

.1 Meet or exceed the following minimum design and performance criteria:

.1 Window Unit Air Leakage, ASTM E283, 6.24 psf (50 mph): 0.05 cfm per square foot of frame or less.

.2 Window Unit Water Penetration: No water penetration through window unit when tested in accordance with ASTM E547, under static pressure of 14.2 psf (75 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot.

.3 Windows shall be certified to a rating of CW-W-PG-30 in accordance with CSA A440.

.2 Submit data sheets and test results demonstrating compliance with these requirements.

1.06 QUALITY ASSURANCE

.1 Single-Source Responsibility: obtain all aluminum-clad wood doors and windows from a single manufacturer regularly engaged in the manufacturing and supply of the specified products, meeting or exceeding the material properties and performance characteristics of the materials specified in this Section.

.1 Coordinate with Section 08 14 76.10 - Aluminum-Clad Bi-Fold Doors in order to develop an integrated delivery and installation schedule and strategy.

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

1.07 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:

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

.2 Store and protect bi-fold doors from all or any damage.
.3 Replace defective or damaged materials with new.

1.08 WARRANTY

.1 Provide manufacturer's standard warranty coverage as follows (commencing from date of completed installation on site):
.1 Glazing (seal failure 20-years; stress cracks 10-years).
.2 Cladding finish (20-years).
.3 Interior finish (5-years).
.4 Hardware (10-years).

2 PRODUCTS

2.01 MANUFACTURED UNITS

.1 Description: factory-assembled aluminum clad fixed windows to sizes, configurations and profiles as indicated and required.

2.02 FRAME

.1 Frames: constructed of solid kiln-dried Eastern White Pine, interior stops and mull casings on mulled units, water repellent preservative treated in accordance with WDMA I.S. 4. Assembled frames shall have factory-installed heavy vinyl nailing fins at head, side jambs, and sill. Nailing fin at head shall have integral drip cap.
.1 Interior Exposed Surfaces: Eastern White Pine with no visible fastener holes.
.2 Exterior Surfaces: Clad with aluminum.
.3 Frame Assembly: Mitered at ends where joined to curved head member.
.4 Overall Frame Depth: 5 inches (127 mm).
.5 Muntins: same construction and finish as frames, sized to meet NBC requirements, and design concept as indicated; profiles in accordance with reviewed shop drawings.

2.03 GLAZING

.1 Glass and glazing: to Section 08 80 50 – Glazing; factory-installed.

.2 Standard interior wood cope sticking: Ogee.

.3 Glazing Seal: Silicone bedding exterior.

2.04 FINISH

.1 Exterior: Aluminum Clad. Fluoropolymer modified acrylic topcoat applied over primer, meeting or exceeding AAMA 2605 requirements. Colour as selected by Departmental Representative from manufacturer's standard range; preference is a bronze colour, shade to be confirmed after review of colour submittals.

.2 Interior Finish: Factory-applied water-borne acrylic enamel clear coat. Applied in two separate coats with light sanding between coats.

2.05 TOLERANCES

.1 Windows shall accommodate the following opening tolerances:
  .1 Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.
  .2 Width Dimensions: Plus 1/4 inch, minus 0 inch.
  .3 Building columns: Plus or minus 1/4 inch from plumb.

2.06 ACCESSORIES

.1 Flashing/Sealant Tapes: manufacturer's recommended or supplied products.

.2 Interior Insulating-Foam Sealant: manufacturer's recommended or supplied low-expansion, low-pressure polyurethane insulating window and door foam sealant.

.3 Exterior Perimeter Sealant: manufacturer's recommended or supplied joint sealant.

.4 Coordinate with related requirements for air and vapour management continuity, including sheet metal flashing, joint sealants, and weather barrier transitions.

3 EXECUTION

3.01 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for hinged safety glass doors installation in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Departmental Representative.
  .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied. Proceeding with work means acceptance of conditions.

3.02 INSTALLATION

.1 Assemble and install window units according to manufacturer’s printed installation instructions and reviewed shop drawings.

.2 Install windows to be weather-tight.

.3 Maintain alignment with adjacent work.

.4 Secure assembly to framed openings, plumb and square, without distortion.

.5 Integrate window system installation with exterior water-resistant barrier using flashing/sealant tape. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.

.6 Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using backer rod and sealant insulating-foam sealant.

.7 Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly..

3.03 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.
  .2 Clean aluminum, stainless steel and bronze with damp rag and approved non-abrasive cleaner in accordance with manufacturer's instructions.

.3 Remove traces of primer, caulking; clean doors and frames.
.4 Clean glass and glazing materials with approved non-abrasive cleaner.
.5 Polish hardware with non-abrasive cleaner and polish as recommended by and in accordance with manufacturer's written instructions.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.04 PROTECTION

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

.2 Repair damage to adjacent materials caused by hinged safety glass door installation.

END OF SECTION

1 GENERAL

1.01 SECTION INCLUDES

.1 Hinges and Pivots.

.2 Mortise Locksets and Deadbolts.

.3 Keying.

.4 Surface Door Closers.

.5 Miscellaneous Trim.

1.02 RELATED SECTIONS

.1 Section – 05 50 00 - Metal Fabrications: Door Frames.

.2 Section 06 10 00 - Rough Carpentry: Door Frames.

.3 Section 07 84 00 - Fire Stopping: Fire rated gaskets at perimeter of doors.

.4 Section08 03 11 - Period Wood Doors.

.5 Section 08 11 00 - Metal Doors and Frames.

.6 Section 08 14 16 - Flush Wood Doors.

1.03 REFERENCES

.1 ANSI A117.1 - American National Standard for Accessible and Useable Buildings and Facilities.

.2 ANSI/BHMA A156.1, "Butts and Hinges" (copyrighted by BHMA, ANSI approved).

.3 ANSI/BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches.

.4 ANSI/BHMA A156.4 - American National Standard for Door Controls - Closers.

.5 ANSI/BHMA A156.6, "Architectural Door Trim" (copyrighted by BHMA, ANSI approved).

.6 ANSI/BHMA A156.7, "Template Hinge Dimensions" (copyrighted by BHMA, ANSI approved).

.7 ANSI/BHMA A156.8, "Door Controls - Overhead Holders" (copyrighted by BHMA, ANSI approved).

.8 ANSI/BHMA A156.13 - American National Standard for Mortise Locks and Latches Series 1000.

.9 ANSI/BHMA A156.15 - Life Safety Closer/Holder/Release Devices.

.10 ANSI/BHMA A156.16 - Auxiliary Hardware.

.11 ANSI/BHMA A156.18 - Materials and Finishes.

.12 ANSI A156.28 - American National Standard for Keying Systems

.13 NFPA 80 - Standard for Fire Doors, Fire Windows.

.14 NFPA 252 - Standard Methods of Fire Tests of Door Assemblies.

.15 Underwriters Laboratories (UL). - Fire Resistance Directory.

.16 ANSI/UL 10C - Standard for Safety for Positive Pressure Fire Tests of Door Assemblies.

.17 NBC - National Building Codes or Canada

1.04 PERFORMANCE REQUIREMENTS

.1 Fire Rated Openings: Provide door hardware listed by UL or Intertek Testing Services (Warnock Hersey Listed), or other testing laboratory approved by applicable authorities.
1. Comply with NFPA 80 for fire ratings indicated, based on testing according to NFPA 252.
2. Comply with UL10C, Positive Pressure Fire Tests of Door Assemblies.

.2 Accessibility Requirements: Comply with requirements of Local building code, and Americans with Disabilities Act (ADA), Accessibility Guidelines for Buildings and Facilities.

1.05 SUBMITTALS

.1 Submit under provisions of Section 01 33 00.

.2 Product Data: Manufacturer's catalog cuts on each product to be used.

.3 Shop Drawings: Indicate locations and mounting heights of each type of hardware, schedules, electrical characteristics and connection requirements.

.4 Schedule:
1. Submit schedule indicating each type of hardware for each door.

2. List manufacturer's name with each manufacturer's hardware number together with finishes in US standards.
3. Show door number/location, handing, door and frame material, manufacture and catalog numbers, all finishes and keying information. Explain fully all abbreviations.

.5 Shop Drawings:
1. Indicate locations and mounting heights of each type of hardware.
2. Supply templates to door and frame manufacturer(s) to enable proper and accurate sizing and locations of cut-outs for hardware.
3. Detail any conditions requiring custom extended lip strikes, or any other special or custom conditions.
4. Wiring diagrams including point to point and riser diagrams, function statements and system descriptions for all electrical hardware

.6 Verification Samples: For each finish product specified.
1. If required by the Architect, submit one sample of each type of typical hardware required illustrating style, color, and finish.
2. Approved samples may be incorporated into Work.

.7 Closeout Submittals:
1. Project Record Documents: Schedule showing actual locations of installed cylinders and their master key code.
2. Parts lists and maintenance instructions including data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.
3. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.06 QUALITY ASSURANCE

.1 Manufacturer Qualifications: A manufacturer with a minimum of ten years experience manufacturing door hardware.

.2 Supplier Qualifications: A supplier with a minimum of two years demonstrated experience in the sale and distribution of builders' hardware for commercial projects and who has successfully completed at least three projects of similar complexity to the project specified.

.3 Hardware Supplier Personnel: Employ Architectural Hardware Departmental Representative (AHC) or equally qualified person to supervise and prepare all schedules, details, and services required for the project.

.4 Hardware Supplier: to provide 3 job site visits for inspection of the hardware. One is before the hardware is installed, the second one is during the install and the last one is on completion of the install. Each inspection is to have a certified AHC complete the inspection and report any issues at the time of inspection.

1.07 DELIVERY, STORAGE, AND HANDLING

.1 Package hardware items individually with necessary fasteners and installation templates when necessary; label and identify each package with door opening code to match hardware schedule.

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

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

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

1.08 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.

1.09 WARRANTY

.1 Provide factory warranty against defects in material and workmanship as follows:
1. Overhead Surface Closers, Grade 1, 25 Year Warranty.
2. Mortise locks, Grade 1, 10 Year Warranty.

1.10 MAINTENANCE MATERIALS

.1 Provide special wrenches and tools applicable to each different or special hardware component.

1.11 COORDINATION

.1 Coordinate work with other directly affected components involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.

.2 Coordinate work with other directly affected components involving electrical wiring and components.

2 PRODUCTS

2.01 MANUFACTURERS

.1 Acceptable Manufacturers: CBH, Dorma, Draftseal, L&S, PBB, RCI.

2.02 HINGES AND PIVOTS

.1 Hinges: ANSI A156.1, full mortise template type complying with following general requirements unless otherwise scheduled.
1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
2. Number: Furnish minimum three hinges to 90 inches (2286 mm) high, four hinges to 120 inches (3048 mm) high for each door leaf.
   a. Fire Rated Doors to 86 inches (2184 mm) high: Minimum three ball bearing hinges.
   b. Residential Wood Doors: Furnish minimum two hinges.
3. Size and Weight: 4-1/2 inch (114 mm) heavy weight typical for 1-3/4 inch (44 mm) doors.
   a. Doors over 40 inches (1 016 mm) wide: Extra heavy weight ball or oilite bearing hinges.
   b. Doors 1-3/8 inch (35 mm) Thick: 3-1/2 inch (89 mm) size.
   c. Doors 2 inch (50 mm) Thick: 5 inch (125 mm) extra heavy weight ball or oilite bearing.
   d. Doors over 48 inches (1 220 mm) wide: 5 inch (125 mm) extra heavy weight ball or oilite bearing.
4. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior and locked outswinging doors, non-rising pins at interior doors.

2.03 MORTISE LOCKSETS AND DEADBOLTS

.1 Lockset: ML9000 Series.
1. Standards:
   a. ANSI Conformance - ANSI A156.13, Operational Grade 1, Security Grade 1.

b. U.L. and C.U.L. listed for use on 3-hour fire-rated doors and for all positive pressure applications.
c. U.L. and C.U.L. listed for UL 10B/10C.
d. Lever trim meets A117.1 and ADA requirements.

2. Features:
a. Stainless steel latch.
b. Stainless steel dead bolt.
c. Hardened steel rollers in dead bolt.
d. Security spacer between inside and outside lever.
e. Steel lock case and internal components.
f. Full length face plate.
g. All trim through-bolted through the lock case.
h. Accepts interchangeable core cylinders.

3. Function:
a. As noted on the hardware schedule attached to this section.

2.04 KEYING

.1 Keying:
1. Keying: Provide master keyed Dorma Series as directed by architect.
2. Construction keyed

.2 Keys:
1. Nickel silver. Stamp keys with "DO NOT DUPLICATE".
2. Supply keys in the following quantities:
a. 15 construction keys.
b. 2 keys for every cylinder.
c. 6 master and sub-master keys

2.05 SURFACE DOOR CLOSERS

.1 Closers used in conjunction with overhead stops and holders shall be templated and coordinated to function properly. Properly detail closers to meet application requirements by providing drop plates, brackets, etc. to meet application and installation requirements as indicated.

.2 8900/8600 Series: ANSI A156.4, Grade 1, heavy duty surface door closer.
1. Model 8916 for interior and exterior applications features adjustable spring sizes from 1 to 6 and meets ANSI A117.1 and ADA for barrier-free accessibility.
2. Compliant with UL10C for positive pressure.
3. Certified to 10 million cycles by a recognized test lab.
4. Non-handed.

5. Featuring full range spring power adjustment and backcheck, with a narrow projection full cover and flatform style arm.
6. Door control also features a backcheck positioning adjustment for parallel arm applications, to maintain an ANSI backcheck range similar to regular and top jamb applications.
7. Independent sweep and latch non-critical closing speed adjustment.

2.06 MISCELLANEOUS TRIM

.1 Push/Pulls: ANSI A156.6; push plates minimum 0.050 inch (1.27 mm) thick.
1. Type:
a. Provide as indicated on the Schedule.
2. Size: Push plates shall be ANSI J302, size 4 inches (102 mm) by 16 inches (406 mm), thickness .050 inch.
3. Size: Pull plates shall be ANSI J405, size 4 inches (102 mm) by 16 inches (406 mm), thickness .050 inch.
4. Cut plates for cylinder or thumb piece when used with deadlock.
5. Provide with through bolts to secure from opposite door face.
6. Finish: As specified in the Door Hardware Schedule.

.2 Flush Bolts: ANSI A156.16 Grade 1 top and bottom flush bolts, with dust-proof floor strike.
1. Provide as indicated on the Schedule.
2. Finish: As specified in the Door Hardware Schedule.

.3 Kickplates, Mop Plate, Armor Plates: ANSI A156.6, metal; height indicated in Schedule by 1 inch (25 mm) less than door width:
1. Provide as indicated on the Schedule.

.4 Stops: Provide for all doors to control the desired limit of opening helping to prevent damage to adjacent walls, columns, equipment, the door or its hardware
1. Provide floor or wall stops when overhead stops have not been listed except in areas where their location would impede traffic. Stops of correct height shall be used on exterior and interior doors.
2. Doors with surface closers may be provided with S-DS or S-IS dead stop arms
3. Use roller type stops in areas where the interfering swing of one door may cause damage through contact with another door.

4. Wall Stops: ANSI A156.1, Grade 1, with no visible screws:
   a. Provide as indicated on the Schedule.
   b. Finish: As specified in the Door Hardware Schedule.
5. Floor Stops: ANSI A156.1 Grade 1:
   a. Provide as indicated on the Schedule.
   b. Finish: As specified in the Door Hardware Schedule.

3 EXECUTION

3.01 EXAMINATION

.1 Do not begin installation until substrates have been properly prepared.

.2 Verify doors and frames are ready to receive door hardware and dimensions are as indicated on shop drawings.

.3 Verify electric power is available to power operated devices and is of correct characteristics.

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

3.02 INSTALLATION

.1 Install in accordance with manufacturer's instructions.

.2 Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

.3 Install with fasteners provided by hardware item manufacturer.

.4 Adjust hardware for smooth operation.

3.03 PROTECTION

.1 Protect installed products until completion of project.

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

3.04 DOOR HARDWARE SCHEDULE

Hardware Group 1, Door D001, D108
1-Continous Hinge, LS300 32D (sized to suit)
1-Lockset M9070 L114A 626
1-Door Closer 8916 SISJ 689
1-Kickplate CBH 903 32D (10in x size to suit)
1-Threshold DS178N (sized to suit)
1-Weather Seal DS130C (size to suit)
1-Door Sweep DS148C (size to suit)

Hardware Group 2, Door D101
3-Hinges PBB BB81 4-1/2x4 652
1-Lockset M9070 L114A 626
1-Kickplate CBH 903 32D (10in x size to suit)
1-Floor Stop CBH 157 26D

Hardware Group 3, Door D105
3-Hinges PBB BB81 4-1/2x4 652
1-Privacy Indicator Lockset M9996 L114A 626
1-Kickplate CBH 903 32D (10in x size to suit)
1-OH Stop 1022SA 32D

Hardware Group 4, Door D107
3-Hinges PBB BB81 4-1/2x4 652
1-Lockset M9070 L114A 626
1-Door Closer 8616 AF86P 689
1-Kickplate CBH 903 32D (10in x size to suit)
1-Floor Stop CBH 157 26D

Hardware Group 5, Door D107A
1-Continous Hinge, LS300 32D (sized to suit)
1-Exit Device 9300 Y(L114)08 630
1-Door Closer 8916 SISJ 689
1-Kickplate CBH 903 32D (10in x size to suit)
1-Threshold DS178N (sized to suit)
1-Weather Seal DS130C (size to suit)
1-Door Sweep DS148C (size to suit)

Hardware Group 6, Door D107B, D107C
1-Automatic Operator ED700 Al
2-Push Buttons RCI 950HP 45D MO 32D
1-Keyswitch RCI 960 DPDT MA 28
3-Power Transfers RCI 9509-7S
All other door hardware provided by door manufacturer.

Door Number and Hardware Group Schedule

Door #	Hardware #
D001	1
D101	2
D105	3
D107	4
D107A	5
D107B	6
D107C	6
D108	1

END OF SECTION

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Section 08 14 76.10 – Aluminum-Clad Bi-Fold Doors.

.2 Section 08 52 13 – Aluminum-Clad Windows.

1.02 REFERENCE STANDARDS

.1 ASTM International
- .1 ASTM C542 05 (2011), Specification for Lock Strip Gaskets.
- .2 ASTM D790 10, Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
- .3 ASTM D1003 11, Test Method for Haze and Luminous Transmittance of Plastics.
- .4 ASTM D1929 11, Test Method for Determining Ignition Temperature of Plastics.
- .5 ASTM D2240 05(2010), Standard Test Method for Rubber Property Durometer Hardness.
- .6 ASTM E84 11a, Test Method for Surface Burning Characteristics of Building Materials.
- .7 ASTM E330 02(2010), Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .8 ASTM C1503-08, Standard Specification for Silvered Flat Glass Mirror.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB 12.1 M90, Tempered or Laminated Safety Glass.
- .2 CAN/CGSB 12.3 M91, Flat, Clear Float Glass.
- .3 CAN/CGSB 12.8 97 AMEND, Insulating Glass Units.

.3 Canadian Standards Association (CSA International)
- .1 CSA A440-11, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights, Includes Update No. 1 (2014).
- .2 CSA A440.2-14/A440.3-14, Fenestration energy performance/User guide to CSA A440.2-14.
- .3 CAN/CSA A440.4-07 (R2012) - Window, Door, and Skylight Installation
- .4 CSA Certification Program for Windows and Doors 2000

.4 Environmental Choice Program (ECP)
.1 CCD-045-95(R2005), Sealants and Caulking Compounds.

.5 Glass Association of North American (GANA)
.1 GANA Glazing Manual (50th Anniversary Edition).
.2 GANA Laminated Glazing Reference Manual (2009 edition).
.3 GANA Guide to Architectural Glass (2010).

1.03 ADMINISTRATIVE REQUIREMENTS

.1 Pre-Installation Meetings:
.1 Convene pre-installation meeting 2 weeks prior to beginning work of this Section and on-site installation, with Contractor's Representative and Departmental Representative in accordance with Section 01 31 19 - Project Meetings to:
.1 Verify project requirements.
.2 Review installation and substrate conditions.
.3 Co-ordination with other building subtrades.
.4 Review manufacturer's written installation instructions and warranty requirements.

.2 Arrange for site visit with Departmental Representative prior to start of Work to examine existing site conditions.

.3 Hold project meetings weekly. Ensure key personnel, site supervisor, project manager, and affected subcontractor representatives attend.

.4 Departmental Representative will submit written notification of change to meeting schedule established upon contract award 48 hours prior to scheduled meeting.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

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

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

.3 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be returned for inclusion into work.

.3 Submit duplicate 300 mm x 300 mm size samples of glass products and insulating glass units.

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

.5 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
.1 Submit testing and analysis of glass under provisions of Section 01 45 00 - Quality Control.
.2 Submit shop inspection and testing for glass.

1.05 CLOSEOUT SUBMITTALS

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

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

1.06 QUALITY ASSURANCE

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

.2 Test Reports: certified test reports showing compliance with specified performance characteristics and physical properties.
.1 Provide testing and analysis of glass under provisions of Section 01 45 00 – Quality Control.
.2 Provide shop inspection and testing for glass if requested by Departmental Representative.

1.07 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

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

.3 Storage and Handling Requirements:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect glazing and frames from damage.
.3 Protect prefinished aluminum surfaces with wrapping or strippable coating.
.4 Replace defective or damaged materials with new.

1.08 AMBIENT CONDITIONS

.1 Ambient Requirements:
.1 Install glazing when ambient temperature is 10 degrees C minimum. Maintain ventilated environment for 24 hours after application.
.2 Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

1.09 WARRANTY

.1 Provide manufacturers guarantee for the following types of glass listed, against defects in materials and workmanship for the period indicated, commencing from the date of Substantial Performance of Work.

.1 Sealed Glass Units: Replace units that exhibit failure of hermetic seal under normal use evidenced by partial or complete obstruction of vision by dust, moisture, or film on interior surface of glass: 2-Years from date of Contract Completion

2 PRODUCTS

2.01 MATERIALS

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

.2 Flat Glass:
.1 Type GL1: tempered laminated glass to CAN/CGSB 12.1, transparent, glazing quality, 6 mm minimum thickness overall; 3 mm each pane.
.1 Type: 2 tempered laminated.
.2 Class: B float.
.3 Category: II – 540 J impact resistance.
.4 Edge treatment: Polished.
.2 Type GL2: heat-strengthened glass to CAN/CGSB 12.1, transparent, glazing quality, 6 mm minimum thickness and as indicated on Drawings.
.1 Type: 1 heat strengthened.
.2 Class: B float.
.3 Category: II – 540 J impact resistance.
.4 Edge treatment: Polished
.3 Type GL3: tempered glass to CAN/CGSB 12.1, transparent, glazing quality, 6 mm minimum thickness.
.1 Type: 2 tempered laminated.
.2 Class: B float.
.3 Category: II – 540 J impact resistance.
.4 Edge treatment: Polished
.4 Type LE1: Low emissivity (LOW-E) glass, clear glass, Low-E coating on 2nd surface, argon gas filled, with the following minimum performance criteria.
.1 Metallic coating: soft, sputtered.
.2 Meets Canadian ENERGY STAR® requirements.
.3 Visible light transmittance: ≥ 64%.
.4 Solar heat gain coefficient: ≤ 0.27.
.5 U-Factor:
.1 Winter nighttime u-value: ≤ 0.28.
.2 Summer daytime u-value: ≤ .26.
.6 Ultraviolet transmittance: ≤6%.

2.02 SEALED INSULATING GLASS

.1 Type IGU-1: Insulating Glass Units (IGU): meet or exceed requirements of CAN/CGSB 12.8. Units shall be certified by the Insulated Glass Manufacturers Alliance (IGMA). Overall unit thickness shall be 25 mm using 6 mm glass thickness for individual panes. Use two-stage seal method of manufacture, as follows:
.1 Primary Seal: polyisobutylene sealing compound between glass and metal spacer/separator, super spacer bar or TDSE Intercept.
.2 Secondary Seal: polyurethane, silicone or polysulphide base sealant, filling gap between the two panes of glass at the edge up to the spacer/separator and primary seal.

.3 Outboard pane: Type GL2 clear heat-strengthened glass, 6 mm thick, with Type LE1(Low-e) coating on 2nd surface.
.4 Inter cavity space: 13 mm space with low-conductivity spacers.
.5 Inert gas fill: ≥95% argon filled.
.6 Inboard pane: Type GL2 heat-strengthened clear glass, 6 mm thick.

.2 Type IGU-2: Double Pane Insulating Glass Units: meet or exceed requirements of CAN/CGSB 12.8. Units shall be certified by the Insulated Glass Manufacturers Alliance (IGMA). Overall unit thickness shall be 25 mm using 6 mm glass thickness for individual panes. Use two-stage seal method of manufacture, as follows:
.1 Primary Seal: polyisobutylene sealing compound between glass and metal spacer/separator, super spacer bar or TDSE Intercept.
.2 Secondary Seal: polyurethane, silicone or polysulphide base sealant, filling gap between the two panes of glass at the edge up to the spacer/separator and primary seal.
.3 Outboard pane: Type GL3 clear tempered glass, 6 mm thick, with Type LE1(Low-e) coating on 2nd surface.
.4 Inter cavity space: 13 mm space with low-conductivity spacers.
.5 Inert gas fill: ≥95% argon filled.
.6 Inboard glass: Type GL2 clear, tempered laminated glass, 6 mm overall thickness.

2.03 ACCESSORIES

.1 Sealants: in accordance with Section 07 92 00 – Joint Sealants.

.2 Glazing sealant: Type as recommended by glazing manufacturer as required to meet or exceed performance requirements. Verify compatibility with insulating glass unit secondary sealant.

.3 Sealant for glazing between edges of glass units: one-component silicone base, non-acidic, non-corrosive qualifying to ASTM C920, and commercially manufactured and designed for structural silicone glazing (SSG)

.4 Setting blocks: Neoprene, 80 90 Shore A durometer hardness to ASTM D2240, to suit glazing method, glass light weight and area.

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

.6 Glazing tape:
.1 Preformed butyl compound with integral resilient tube spacing device, 10 15 Shore A durometer hardness to ASTM D2240; coiled on release paper; black colour.
.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.

.7 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%, designed for compression of 25% to effect an air and vapour seal.
.2 Silicone Sealant: One-part neutral curing silicone, medium modulus sealant, Type S; Grade NS; Class 25 with additional movement capability of 50% in both extension and compression (total 100%); Use (Exposure) NT; Uses (Substrates) G, A, and O as applicable.
.3 Setting Blocks: Hardwood, glass width by 100 mm x 5 mm thick.
.4 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.
.5 Cleaners, Primers, and Sealers: Type recommended by manufacturer of glass and gaskets.

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

.9 Glazing clips: manufacturer's standard type.

.10 Lock strip gaskets: to ASTM C542.

.11 Other Glazing Accessories: to CAN/CSA A440.

.12 Screws, bolts and fasteners: ASTM F738M; Type 304 stainless steel.

.13 Glass presence markers: easily removable, non-residue depositing.

2.04 FABRICATION

.1 Verify glazing dimensions on Site.

.2 Clearly label each glass light with maker's name, weight, quality, type and certification number. Do not remove labels until after work has been reviewed by Departmental Representative.

.3 Accurately size glass to fit openings allowing the clearances shown on the following tables:

.1 Minimum glass clearances:

Thickness	**Edge Clearance**	**Face Clearance**
2 mm	3 mm*	1.5 mm
3 mm	3 mm*	3 mm
4 mm	3 mm*	3 mm
5 mm	3 mm*	3 mm
6 mm	5 mm	3 mm
6 mm	6 mm	3 mm
over 6 mm	6 mm or 3/4 times the glass thickness, whichever is greater	

* = where any dimension of glass exceeds 760 mm increase minimum edge clearance by 1.5 mm.

.4 Bite of glass edge on stop:
.1 Up to 1270 mm united size: 6 mm minimum.
.2 1270 mm to 2540 mm united size: 10 mm minimum.
.3 Over 2540 mm united size: 13 mm minimum.

3 EXECUTION

3.01 COMPLIANCE

.1 Install work in accordance with the Quality Management provisions specified in this section and manufacturer’s written instructions.

.2 Size glass to Building Code requirements and verify glass for openings are correctly sized and are within allowable tolerances. Install glass with full contact and adhesion at perimeter. Maintain edge clearance recommended by glass manufacturer.

.3 Perform work in accordance with GANA Glazing Manual and GANA Laminated Glazing Reference Manual for glazing installation methods.

3.02 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for glazing installation in accordance with manufacturer's written instructions.
- .1 Verify that openings for glazing are correctly sized and within tolerance.
- .2 Verify that surfaces of glazing channels or recesses are clean, free of obstructions, and ready to receive glazing.
- .3 Visually inspect substrate in presence of Departmental Representative.
- .4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .5 Proceed with installation only after unacceptable conditions have been remedied.
- .6 Commencement of work means acceptance of conditions.

3.03 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.

3.04 INSTALLATION: EXTERIOR - DRY METHOD (PREFORMED GLAZING)

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

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

.3 Cut glazing tape to length; install on glazing light. Seal corners by butting tape and sealing junctions with sealant.

.4 Place setting blocks at 1/3 points, with edge block maximum 150 mm from corners.

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

.6 Install removable stops without displacing glazing tape. Exert pressure for full continuous contact.

.7 Trim protruding tape edge.

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

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

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

.3 Place setting blocks at 1/3 points, with edge block maximum 150 mm from corners.

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

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

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

.7 Knife trim protruding tape.

3.06 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.
    .1 Remove traces of primer, caulking.
    .2 Remove glazing materials from finish surfaces.
    .3 Remove labels.
    .4 Clean glass using approved non-abrasive cleaner in accordance with manufacturer's instructions.
  .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.07 PROTECTION

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

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

.3 Repair damage to adjacent materials caused by glazing installation.

3.08 SCHEDULE

.1 Upper exterior windows: Type IGU-1.

.2 Lower exterior doors and windows: Type IGU-2.

END OF SECTION

Part 1 General

1.1 RELATED SECTIONS

.1 Section 03 30 00 – Cast-in-Place Concrete

.2 Section 05 50 00 – Metal Fabrications

.3 Section 07 62 00 – Metal Flashing and Trim

.4 Section 07 92 00 – Joint Sealants

1.2 REFERENCES

.1 Air Movement and Control Association International, Inc. (AMCA)
- .1 AMCA 500-L-12, Laboratory Methods of Testing Louvers for Rating.

.2 Aluminum Association (AA)
- .1 AA DAF-45, Designation System for Aluminum Finishes.

.3 ASTM International (ASTM)
- .1 ASTM B209-14, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .2 ASTM B211-12e1, Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire.

.4 Underwriter's Laboratories of Canada (ULC)
- .1 CAN/ULC S701-11, Thermal Insulation, Polystyrene, Boards and Pipe Covering

1.3 SUBMITTALS

.1 Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.

.2 Product Data: Submit manufacturer’s data sheets, installation instructions and standard details.

.3 Shop drawings:
- .1 Indicate fabrication and erection details, including anchorage, accessories, profiles, and finishes.
- .2 Indicate pressure drop, face area, and free area.

.4 Samples:
- .1 Submit colour samples for initial selection for each louver.

.5 Closeout Submittals:
- .1 Submit operation and maintenance data for incorporation into operations and maintenance manual in accordance with Section 01 78 00 – Closeout Submittals.

1.4 QUALITY ASSURANCE

.1 Louvre Installer Qualifications: having minimum of 5-years of successful documented experience installing louvres and authorized in writing by the manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in containers with labels legible and intact and grade-seals unbroken.

.2 Store materials so as to prevent damage or contamination.

.3 Store materials in a dry area, protected from freezing, staining and damage.

Part 2 Products

2.1 DESIGN AND PERFORMANCE CRITERIA

.1 Design louvre work in accordance with NBC and amendments, and to withstand live, dead, lateral, wind, seismic, handling, transportation and erection loads, imposed and other loads.

.2 Design and fabricate louvres with minimum 50% free area to permit passage of air; maximum pressure drop through louvre 50 Pa.

.1 Effectiveness Ratio: 99% when tested for 1 hour at an exterior wind velocity of 13 m/s (29 mph) and a rainfall rate of 75 mm/hr (3 in/hr).

2.2 MATERIALS

.1 Aluminum sheet: to ASTM B209M.

.2 Frame and mullion: ASTM B211M; Extruded aluminum alloy Aluminum Association alloy 6063-T5 assembled with fastenings, 3 mm thick material minimum for head, sill, and jamb. Mullions: concealed at 1500 mm maximum centres.

.3 Blades: stormproof with centre watershed in blade, minimum 3 mm thick, maximum blade length 1500 mm.

.4 Finishes: as selected by Departmental Representative from manufacturer’s full range.

.5 Provide the following accessories:

.1 Duct collars.

.2 Extended sill, finished to match louver.

.6 Fastenings: AISI Type 304 stainless steel, SAE-194-8F with SAE-194-SFB nuts and resilient neoprene washers between:

.1 Aluminum and head of bolt.

.2 Between nut, stainless steel washer and aluminum body.

.7 Bird screen: Crimped 2.90 mm diameter aluminum wire cloth secured to 3 mm minimum thick extruded aluminum U-frame mitred at corners. Mesh size: 13 mm.

.8 Blank-off panels (as required):
.1 Aluminum sheet metal to match associated louver.
.1 Aluminum sheet: ASTM B209M; Alloy 1100-H14, 0.8 mm thick.

2.3 ACCESSORIES

.1 Isolation coating: Bituminous solvent type paint.

.2 Anchors and fasteners: AISI Type 304 stainless steel.

.3 Sealant: to Section 07 92 00 – Joint Sealants, commercial-grade, one-component silicone-base chemical-curing, in standard colours as selected by Departmental Representative.

.4 Joint backing: Product recommended by louver sealant manufacturer.

2.4 FABRICATION

.1 Refer to Mechanical Drawings: two louvres required,600 x 1500 mm and 1500 x 600 mm.

.2 Louvres shall be fabricated and installed complete with frames, stormproof blades, bird screens and insulated metal blank-off panels as required.

.3 Construction: welded with exposed joints ground flush and smooth.

.4 Depth: refer to Drawings, depth as required to suite location and construction.

.5 Construct blades and frames of extruded aluminum. Provide weepholes to frames at maximum 610 mm o.c. to direct water to the building exterior.

.6 Align vertical exposed mullions with cladding vertical mullions.

.7 Bird screen: screening shall be replaceable within the frames.

.8 Should louvres cover an area larger than the area covered by the ducts connected to the louvres, the overage shall be covered with blank-off panels. Blank-off panels shall be as specified for insulated metal air/vapour barriers, but applied to the building interior side. The exterior side of the panels shall be finished flat black.

.9 Provide flashing and trim as required, to Section 07 62 00 – Metal Flashing and Trim.

.10 Seal perimeter as required, to Section 07 92 00 – Joint Sealants.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's printed installation instructions, datasheets, specifications, and standard and job-specific details.

3.2 EXAMINATION

.1 Verify condition and dimensions of previously installed Work upon which this Section depends. Report defects to Departmental Representative. Commencement of Work means acceptance of existing conditions.

3.3 INSTALLATION

.1 Install at locations indicated, to manufacturer's written instructions, Drawings, and the requirements of this section.

.2 Coordinate framing and anchorage for louvres with other parts of the Work.

.3 Install bird screen to inside face of louvres.

.4 Securely anchor into structure.

.5 Install blank-off panels as necessary to accommodate mechanical work, fasten securely.

.6 Apply isolation coating to separate dissimilar metals, and metals and masonry or concrete unless neoprene washers are used.

.7 Install duct collars as required and extended sills as indicated.

.8 Seal louvre and blank-off panel perimeter with sealant and joint backing for weathertight seal in accordance with requirements of Section 07 92 00 – Joint Sealants.

3.04 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
  .1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
  .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.05 PROTECTION

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

.2 Repair damage to adjacent materials caused by toilet and bathroom accessories installation.

END OF SECTION