## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 27 10 - Air Barriers.

.3 Section 07 90 00 - Joint Sealing.

.4 Section 08 14 16 - Flush Wood Doors.

.5 Section 08 71 10 - Door Hardware.

.6 Section 08 80 50 - Glazing.

.7 Section 09 91 12 - Exterior Painting.

.8 Section 09 91 23 - Interior Painting.

### 1.2 REFERENCES

.1 American Society for Testing and Materials (ASTM).
.1 ASTM A 653/A 653M-07, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.2 ASTM E125-63(2003) Standard Reference Photographs for Magnetic Particle Indications on Ferrous Castings.

.2 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.

.3 Canadian Standards Association (CSA).
.1 CSA G40.21-04(R2009), Structural Quality Steels.
.2 CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA).
.1 CSDFMA, Specifications for Commercial Steel Doors and Frames, latest addition.
.2 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, latest addition.

.5 National Fire Protection Association (NFPA).
.1 ANSI/NFPA 80-2013, Fire Doors and Windows.

1.2 REFERENCES (Cont'd)

.5 (Cont'd)
.2 ANSI/NFPA 252-2008, Door Assemblies, Fire Tests of.

.6 Underwriters' Laboratories of Canada (ULC).
.1 CAN4-S104-M80(R1985), Fire Tests of Door Assemblies.
.2 CAN4-S105-M85(R1992), Fire Door Frames.

1.3 DESIGN REQUIREMENTS

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

1.4 SHOP DRAWINGS

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

1.5 SAMPLES

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

1.6 REQUIREMENTS OF REGULATORY AGENCIES

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

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 or ANSI/NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 35 43 - Environmental Procedures.

1.7 WASTE MANAGEMENT AND DISPOSAL (Cont'd)

.2 Solvent based paints, which cannot be reused must be treated as hazardous waste and disposed of in an appropriate manner in accordance with hazardous waste regulations. Empty paint cans are to be dry prior to disposal or recycling (where available).

.3 Where paint recycling is available, collect all waste paint by type and provide for delivery to recycling or collection facility.

.4 Paints and finishes are regarded as hazardous products and are subject to regulations for their disposal. Information on these controls can be obtained from the Provincial Ministries of Environment and Regional levels of Government.

## PART 2 - PRODUCTS

2.1 PRIMERS

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

2.2 PAINT

.1 Steel frames shall be field painted in accordance with Sections 09 91 12 Exterior Painting and 09 91 23 Interior Painting. Weatherstrips shall be protected from paint. Finish shall be free of scratches or other blemishes.

2.3 ACCESSORIES

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

.2 Exterior weather caps to be installed at all exterior doors.

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

2.4 DOOR CORE MATERIALS

.1 Accoustic doors and frames:
.1 Accoustic doors and frames to ASTM E90 and ASTM E413, steel face sheet construction, and be equipped with sound seal, and threshold.

2.4 DOOR CORE MATERIALS (Cont'd)

.1 (Cont'd)

.2 Doors and frames to meet STC 50, and betested by an independent lab for conformance, under this contract.

.3 Acceptable material: Accoustic steel as manufactured by Ambico Limited or an approved alternate.

2.4 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDFMA specifications.

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

.3 Exterior frames: 1.98 mm thermally broken type construction.

.4 Interior frames: 1.6 mm welded type construction.

.5 Blank, reinforce, drill and tap frames for mortised, templates hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware. Reinforce frames across the head, where a closer is to be installed with a continuous 6 mm thick steel plate welded to both sides of frame. Reinforce frames at each hinge and strike point with a minimum 6 mm steel plate of sufficient length to be welded at each end of hinge and strike opening. Reinforce heads of frames wider than 1,200 mm.

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

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

.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 Insulate exterior frame components with polyurethane insulation.

2.5 FRAME ANCHORAGE

.1 Provide appropriate anchorage to floor and wall construction.

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

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

2.6 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

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

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

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

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

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

2.7 THERMALLY BROKEN DOORS AND FRAMES

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

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

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

.4 Apply insulation.

PART 3 - EXECUTION

3.1 INSTALLATION GENERAL

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

.2 Install doors and frames to CSDFMA Installation Guide.

3.2 FRAME INSTALLATION

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

.2 Secure anchorages and connections to adjacent construction.

.3 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1200 mm wide. Remove temporary spreaders after frames are built-in.

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

.5 Caulk perimeter of frames between frame and adjacent material.

.6 Maintain continuity of air/vapour barrier.

.7 Silicone in place rubber door stops.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware - General.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
.1 Hinge side: 1.0 mm.
.2 Latchside and head: 1.5 mm.
.3 Finished floor, and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

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

END OF SECTION

PART 1 - GENERALÿ

1.1 RELATED WORK

.1 Section 06 10 00 - Rough Carpentry.

.2 Section 07 90 00 - Joints Sealing.

.3 Section 08 80 50 - Glazing.

1.2 REFERENCES

.1 Aluminum Association Designation System for Aluminum Finishes.

.2 ASTM E 330-02(2010) Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

.3 CSA G40.21-04(R2009) Structural Quality Steels.

.4 CAN/CSA-G164-M92 (R2003) Hot Dip Galvanizing of Irregularly Shaped Articles.

.5 CAN/CGSB-1.40-M97 Primer, Structural Steel, Oil Alkyd Type.

1.3 DESIGN CRITERIA

.1 Design frames and doors in exterior walls to:
.1 Accommodate expansion and contraction within service temperature range of -35 to 35°C.
.2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E 330 under wind load of 1.2 kpa. Submit certificate of tests performed.

1.4 SAMPLES

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

1.5 SHOP DRAWINGS

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

1.5 SHOP DRAWINGS (Cont'd)

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

1.6 MAINTENANCE DATA

.1 Provide maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual specified.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Aluminum extrusions: Aluminum Association alloy AA6063-T5 anodizing quality.

.2 Steel reinforcement: to CSA G40.21, grade 300W.

.3 Fasteners: aluminum, finished to match adjacent material.

.4 Isolation coating: alkali resistant epoxy resin solution.

.5 Glazing materials: Section 08 80 50.

.6 Sealants: Section 07 90 00, colour selected by Departmental Representative.

2.2 ALUMINUM DOORS

.1 Construct doors of porthole extrusions with minimum wall thickness of 12ga..

.2 Door stiles nominal 89 mm wide plus or minus 6 mm.

.3 Top rail nominal 89 mm wide plus or minus 6 mm.

.4 Bottom rail nominal 203 mm wide plus or minus 6 mm.

.5 Centre rail nominal 203 mm wide plus or minus 6 mm.

.6 Reinforce mechanically-joined corners of doors to produce sturdy door unit.

2.2 ALUMINUM DOORS (Cont'd)

.7 Glazing stops: interlocking snap-in type for dry glazing. Exterior stops: tamperproof type.

.8 Hardware:
.1 Weatherstripping: replaceable mohair.
.2 Door bumpers: black neoprene.
.3 Door bottom seal: adjustable door seal of anodized extruded aluminum frame and vinyl weather seal.
.4 Door pull: Aluminum "D" style pull, solid 32 mm diameter x 406 mm in length x 32 mm in width.
.5 Hinges: Continuous Geared Aluminum Hinges: to ANSI, Grade 1 performance, with nylon thrust blocks at 203 mm centers maximum, aluminum finish to match doors and frames.
.6 All hardware to match aluminum finish.

2.3 ALUMINUM FRAMES

.1 Construct thermally broken frames of aluminum extrusions.

.2 Frame members 50 mm x 114 mm nominal size, for applied stops.

.3 Frames to be by same manufacture.

2.4 ALUMINUM FINISHES

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
.1 Integral colour: Clear Anodized Aluminum.

.2 Appearance and properties of anodized finishes designated by the Aluminum Association as Architectural Class 1, Architectural Class 2, and Protective and Decorative.

2.5 STEEL FINISHES

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

2.6 FABRICATION

.1 Doors and framing to be by same manufacturer.

.2 Fabricate doors and frames to profiles and maximum face sizes as shown. Provide minimum 22 mm bite for insulating glazed units.

.3 Provide structural steel reinforcement as required.

.4 Fit joints tightly and secure mechanically.

.5 Conceal fastenings.

.6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 10 - Door Hardware.

.7 Isolate aluminum from direct contact with dissimilar metals, concrete and masonry.

## PART 3 - EXECUTION

3.1 INSTALLATION

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

.2 Anchor securely.

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

.4 Adjust operable parts for correct function.

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

3.2 GLAZING

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

3.3 CAULKING

.1 Seal joints to provide weathertight seal at outside and air/vapour seal at inside.

3.3 CAULKING (Cont'd)

.2 Apply sealant in accordance with Section 07 90 00 - Joint Sealing. Conceal sealant within the aluminum work except where exposed use is permitted by Departmental Representative.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

.1 Section 08 11 14 - Metal Doors and Frames.

.2 Section 08 71 10 - Door Hardware.

.3 Section 08 80 50 - Glazing.

### 1.2 REFERENCES

.1 Canadian Standards Association (CSA).
.1 CSA O115-M1982(R2005), Hardwood and Decorative Plywood.
.2 CAN/CSA-O132.2 Series-90(R1998), Wood Flush Doors.

.2 Canadian General Standards Board (CGSB).
.1 CAN/CGSB-71.19-M88, Adhesive, Contact, Sprayable.
.2 CAN/CGSB-71.20-M88, Adhesive, Contact, Brushable.

.3 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
.1 AWMAC Quality Standards for Architectural Woodwork version 2, 8th addition, date 2005.

### 1.3 SHOP DRAWINGS

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

### 1.4 SAMPLES

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

### 1.5 STORAGE AND PROTECTION

.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.

1.5 STORAGE AND PROTECTION (Cont'd)

.4 Wrap and crate doors with factory applied finish.

1.6 WARRANTY

.1 For the Work of this Section 08 14 16 - Flush Wood Doors, the 12 months warranty period is to be extended to 36 months.

PART 2 - PRODUCTS

2.1 WOOD FLUSH SOLID DOORS

.1 Solid core(anti-warping):
.1 Construction: to CAN/CSA-O132.2 Series-90.
.2 Face veneer shall be 3 mm 3 ply door skin. Type I cold pressed PVA cross-linked adhesive. Species to be Rotary Cut, White Birch, book match.
.3 Thickness: 45 mm.
.4 Stiles: 3 mm rotary-cut poplar veneer, longitudinal laminated by hot pressing with a type 1 structural glue, for a total thickness of 100 mm, including 16 mm piece of birch to match face.
.5 Rails: 3 mm rotary-cut poplar veneer, longitudinally laminated by hot pressing with a type 1 structural glue, for a total thickness of 56 mm , including 16 mm piece of softwood.
.6 Core: Solid particle core with density of 449kg/$m^3$.
.7 Doors to be factory machined and factory finished.

2.2 GLAZING

.1 Glass: Refer to Section 08 80 50.

2.3 FABRICATION

.1 Vertical edge strips to match face veneer.

.2 Prepare doors for louvres and glazing. Provide hardwood to match face veneer for glazing stops with mitred corners.

.3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 2 mm in 50 mm on hinge side.

2.3 FABRICATION (Cont'd)

.4 Radius vertical edges of double acting doors to 60mm radius.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Unwrap and protect doors in accordance with CAN/CSA-O132.2 Series-90, Appendix A.

.2 Install doors and hardware in accordance with manufacturer's printed instructions and CAN/CSA-O132.2 Series-90, Appendix A.

.3 Adjust hardware for correct function.

.4 Install glazing in accordance with Section 08 80 50 - Glazing.

.5 Install louvres and stops.

3.2 ADJUSTMENT

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

END OF SECTION

## PART 1 - GENERAL

1.1 RELATED SECTION

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

1.2 SHOP DRAWINGS

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

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

1.3 SAMPLES

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

.2 Submit one 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.

1.4 CLOSEOUT SUBMITTALS

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

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction/Demolition Waste Management & Disposal, and with the Waste Reduction Workplan.

.2 Remove from site and dispose of all packaging materials at appropriate recycling facilities.

.3 Collect and separate for disposal paper, plastic, polystyrene, corrugated cardboard, packaging material, in appropriate on-site bins for recycling in accordance with Waste Management Plan.

.4 Divert unused metal materials from landfill to metal recycling facility as approved by departmental representative.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 33 00 - Submittal Procedures.

.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.

PART 2 - PRODUCTS

2.1 ACCESS DOORS

.1 Sizes: Except as indicated otherwise, to be minimum sizes as follows:
.1 For body entry: 600 x 600 mm.
.2 For hand entry: 300 x 300 mm.

.2 Construction: Rounded safety corners, concealed hinges, screwdriver latch, anchor straps, able to open 180°.

.3 Materials
.1 Tiled or marble surfaces and other special areas: Stainless steel with brushed satin or polished finish as directed by Departmental representative.
.2 Other areas: Prime coated steel.

2.2 EXCLUSIONS

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

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Installation:
.1 Drywall surfaces: to Section 09 21 16 - Gypsum Board Assemblies.

3.2 LOCATION

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

**END OF SECTION**

## PART 1 - GENERAL

### 1.1 RELATED WORK

.1 Section 06 40 00 - Architectural Woodwork.

.2 Section 07 27 10 - Air Barriers.

.3 Section 08 11 14 - Steel Doors & Frames.

.4 Section 08 11 16 - Aluminum Doors and Frames.

.5 Section 08 14 16 - Flush Wood Doors.

### 1.2 REFERENCE STANDARDS

.1 Standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames prepared by Canadian Steel Door and Frame Manufactures' Association, ANSI/NFPA 80-2013 and ANSI/BHMA.

.2 ANSI/BHMA A156.1-2006, Butts and Hinges.

.3 ANSI/BHMA A156.3-2001, Exit Devices.

.4 ANSI/BHMA A156.4-2008, Door Controls (Closers).

.5 ANSI/BHMA A156.5-2010, Auxiliary Locks and Associated Products.

.6 ANSI/BHMA A156.6-2010, Architectural Door Trim.

.7 ANSI/BHMA A156.7-2009, Template Hinge Dimensions.

.8 ANSI/BHMA A156.8-2010, Door Controls - Overhead Holders.

.9 ANSI/BHMA A156.16-2002, Auxiliary Hardware.

.10 ANSI/BHMA A156.18-2000, Materials and Finishes.

1.3 REQUIREMENTS REGULATORY AGENCIES

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

1.4 HARDWARE LIST

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

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

.3 Include with hardware list, product data cuts for all hardware specified noting manufacturer, and model number.

1.5 MAINTENANCE DATA

.1 Provide operation and maintenance data for door closers, locksets, door holders and fire exit hardware for incorporation into manual specified in Section 01 78 00 -Closeout Submittals.

.2 Brief maintenance staff regarding proper care, cleaning, and general maintenance.

1.6 MAINTENANCE MATERIALS

.1 Provide maintenance material and spare parts and tools in accordance with Section 01 78 00 - Closeout Submittals.

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

1.7 DELIVERY AND STORAGE

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

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

1.8 COORDINATION .1 At job start up and 1 week prior to interim inspection, contractor shall organize a meeting with hardware supplier, manufacturer's technicians, door and frame manufacturer and installers to coordinate hardware installation and operation. Advise Departmental Representative dates and times of such meetings.

PART 2 - PRODUCTS

2.1 HARDWARE ITEMS .1 Use one manufacturer's products only for all similar items.

.2 Hardware to CAN/CGSB/ANSI/BHMA standards listed, or where none exists material to be qualified for similar use.

2.2 DOOR HARDWARE .1 Mortise Locksets:

.1 Noted in Hardware Schedule as Function only (use the following lever or knob, with related function per schedule):

.1 Heavy duty mortise locksets to ANSI A156.13, series 1000, security grade 1.

.2 Functions as follows:

.1 ANSI F04 - Office Function.

.2 ANSI F07 - Storeroom or Service Function.

.3 ANSI F14 - Storeroom Function.

.4 ANSI F19 - Privacy.

.2 All locksets above to be lever function as noted in hardware schedule, and finished in Satin chrome.

.3 Round rose, satin chrome.

.4 ANSI Standard Strikes with ANSI box.

.5 Trim Design:

.1 Lever design: solid handle, round bar contoured in a "C" shape with angle return, similar in design and style as the Sargent "J" Level, Schlage "93" or Corbin "Lustra".

.6 Cylinders and keying: Cylinders from same manufacturer as lockset, 6 pin mortised unit, supplied keyway, registered with manufacturer, designated as Sargent "NJ" or Schlage "D" or Corbin-Russwin "C1".

2.2 DOOR HARDWARE (Cont'd)

.1 (Cont'd)
.7 Finished to ANSI 626 (interior) and 626 (exterior).
.8 UL/ULC listed for use on fire rated doors as per Door and Frame Schedule.
.9 Acceptable product: Sargent 8200, Schlage L9000, Corbin-Russwin ML2000, or an approved alternate.

.2 Butts and hinges to ANSI/BHMA A 156.1. 3 Butts per door panel up to 1000mm in width, 4 Butts per door over 1001mm in width:
.1 Listed in Hardware Schedule as A1:
.1 Stainless steel, full mortise, templated, 5 knuckle, 2 permanently lubricated ball bearings, non-removable pin (NRP), 114 x 114 x 3.4mm, finished to ANSI 626.
.1 Acceptable product: Stanley FBB 191, Hager BB1191 or McKinney TA2314, or an approved alternate.
.2 Listed in Hardware Schedule as A2:
.1 Steel base polished and plated, full mortise, templated, 5 knuckle, 2 permanently lubricated ball bearings, 114 x 102 x 3.4mm, finished to ANSI 626.
.1 Acceptable product: Stanley FBB 179, Hager BB1279 or McKinney TA2714, or an approved alternate.

.3 Exit Devices:
.1 Listed in Hardware Schedule as C1:
.1 To ANSI/BHMA A156.3, type 8, Grade 1, concealed vertical rod, modern-narrow stile, Lexan touchpad on push rail, cast strike with nylon rub strip, concealed mounting, handle set in stainless steel trim plate, hex key dogging, interchangeable core, key into building system, top and bottom strike, finish to ANSI 626.
.1 Acceptable product: Sargent 8400 Series, or an approved alternate.

.4 Door Closers:
.1 Listed in Hardware Schedule as D1:

2.2 DOOR HARDWARE (Cont'd)

.4 (Cont'd)
.1 (Cont'd)
.1 Door controls (closers): to ANSI/BHMA A156.4, Grade 1, heavy duty, non handed, top jamb mounted, aluminum body with aluminum cover, adjustable through ranges 1 to 6, adjustable backcheck and delayed action, finished to ANSI 689.
.2 Accessory mounting plate, top jamb mounting.
.3 Acceptable product: Sargent 350-O x 351-B, LCN 4040-18G, or an approved alternate.
.2 Listed in Hardware Schedule as D2:
.1 Door controls (closers): to ANSI/BHMA A156.4, Grade 1, standard duty, non handed, parallel arm, aluminum body with high impact acrylic cover, adjustable through ranges 1 to 4, adjustable backcheck and delayed action, finished to ANSI 689.
.2 Acceptable product: Sargent 1431-O LCN 1460T, or an approved alternate.

.5 Auxiliary Trim & Devices:
.1 Listed in Hardware Schedule as F1:
.1 Kickplate to ANSI/BHMA A156.6, 200 x 1.3 mm thick stainless steel by door width less 50 mm long, 15 mm radiused corners, screw attached, finished to ANSI 626.
.2 Acceptable product: Hager 194S, Standard Metal Hardware Manufacturing K10R, or an approved alternate.
.2 Listed in Hardware Schedule as F2:
.1 Door Pull to ANSI/BHMA A156.6, stainless steel "D" pull, round 19 x 230 mm profile, finished to ANSI 626.
.2 Acceptable product: Hager 3L, Standard Metal Hardware Manufacturing 2007, or an approved alternate.
.3 Listed in Hardware Schedule as F3:
.1 Pushplate to ANSI/BHMA A156.6, 100 x 400 x 1.3 mm thick stainless steel, 15 mm radiused corners, screw attached, finished to ANSI 626.

.6 Door controls: Stops and overhead holders:
.1 Listed in Hardware Schedule as G1:

2.2 DOOR HARDWARE (Cont'd)

.6 (Cont'd)
.1 (Cont'd)
.1 Floor stop to ANSI/BHMA A156.8, solid cast brass or bronze, circular shape, rubber insert, concealed mounting, 45 mm diameter, finished to ANSI 626.
.2 Acceptable product: Hager 241F/243F, Standard Metal Hardware Manufacturing S101/S103, or an approved alternate.
.2 Listed in Hardware Schedule as G2:
.1 Wall stop to ANSI/BHMA A156.8, solid cast brass or bronze, circular shape, convex rubber insert or concave at push button locksets (replaceable), concealed mounting, 60 mm diameter x 25 mm projection, finished to ANSI 626.
.2 Acceptable product: Hager 230W/234W, Standard Metal Hardware Manufacturing S121/S123, Gallery Specialty Hardware 240B/250B, or an approved alternate.
.3 Listed in Hardware Schedule as G3:
.1 Overhead stop release devices to ANSI/BHMA A156.8, heavy duty, non-friction stop type, surface mounted, extruded bronze track 21 x 17.5 mm, extruded bronze arm 19 x 4.8 mm, heavy duty tempered steel spring, non-handed, sized for door leaf width indicated, finished to ANSI 626.
.2 Acceptable product: Sargent 598S, Glynn-Johnson 104S, or an approved alternate.

.7 Weatherstrip Set:
.1 Listed in Hardware Schedule as H2:
.1 Head and jamb seal:
.1 Extruded aluminum frame 25 mm width and hollow bulb neoprene insert, clear anodized finish.
.2 Acceptable product: K.N. Crowder W-2, Hager 891S or approved equal.
.2 Door bottom seal (unless H4 below is noted):
.1 Extruded aluminum frame 25 mm width and vinyl sweep, clear anodized finish.
.2 Acceptable product: K.N. Crowder W13S, Hager 750S or approved equal.

2.2 DOOR HARDWARE (Cont'd)

.7 (Cont'd)
.2 (Cont'd)

.8 Automatic Door Bottom Seal listed in Hardware Schedule as H4:
.1 Extruded aluminum combined with closed cell sponge neoprene. Plunger depresses automatically when door is closed. Seal to be mounted in door bottom (hidden type).

2.3 FASTENINGS

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

.2 Exposed fastening devices to match finish of hardware.

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

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

2.4 KEYING

.1 All keying shall be in masterkey format, keyed into Owner supplied schedule.

.2 Provide three keys per cylinder.

.3 Provide three masterkeys.

2.5 MISCELLANEOUS HARDWARE

.1 Engraved Plastic Plate Signs: 3 mm thick acrylic, two colours, reverse engraved, lettered for room use other locations, Room number.
.1 Acceptable product: PMI, ASI, Hager or approved alternate.
.2 Schedule: as follows:
.1 50 x 100 mm door frame numbers(All openings). Numbering to conform to drawings.
.2 50 x 100 mm room names at all locations.

## PART 3 - EXECUTION

### 3.1 INSTALLATION INSTRUCTIONS

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

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

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

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

### 3.2 SCHEDULE

.1 See enclosed Hardware Schedule for all hardware items.

END OF SECTION

## PART 1 - GENERAL

### 1.1 RELATED SECTIONS

.1 Section 07 90 00 - Joint Sealing.

.2 Section 08 11 14 - Metal Doors and Frames.

.3 Section 08 11 16 - Aluminum Doors and Frames.

.4 Section 08 14 16 - Flush Wood Doors.

### 1.2 REFERENCES

.1 ASTM E 330-02 (2010) Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

.2 ASTM C 542-05(2011)Specification for Lock-Strip Gaskets.

.3 ASTM D 2240-05 (2010)Test Method for Rubber Property - Durometer Hardness.

.4 CAN/CGSB-12.1-M90 Tempered or Laminated Safety Glass.

.5 CAN/CGSB-12.3-M91 Flat, Clear Float Glass.

.6 CAN/CGSB-12.11-M90 Wired Safety Glass.

.7 Flat Glass Manufacturers Association (FGMA) Glazing Manual.

### 1.3 PERFORMANCE REQUIREMENTS

.1 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

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

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

1.4 SAMPLES

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

1.5 MOCK-UPS

.1 Construct mock-up where directed.

.2 Allow 24 hours for inspection of mock-up by Departmental Representative before proceeding with work.

.3 When accepted, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of the finished work.

1.6 CLOSEOUT SUBMITTALS

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

1.7 SHOP DRAWINGS

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

1.8 QUALITY ASSURANCE

.1 Perform work in accordance with FGMA Glazing Manual and IGMAC for glazing installation methods.

1.9 ENVIRONMENTAL REQUIREMENTS

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

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

PART 2 - PRODUCTS

2.1 MATERIALS: FLAT GLASS

.1 Tempered glass: to CAN/CGSB-12.1-M90, coloured, 5 mm thick.
.1 Type 2 - tempered.
.2 Class B - float.

2.1 MATERIALS: FLAT GLASS (Cont'd)

.1 (Cont'd)
.3 Colour to be selected by Departmental Representative.

.2 Wired glass: to CAN/CGSB-12.11, 5 mm thick.
.1 Type 1 - Polished both sides (transparent).
.2 Wire mesh styles 1 - Diamond.

.3 Safety Glass: to CAN/CGSB-12.1, Glazing quality, 6mm thick.
.1 Type - Tempered.
.2 Class 8 Float.

2.2 MATERIALS

.1 Sealant: Refer to Section 07 90 00.

2.3 ACCESSORIES

.1 Setting blocks: Neoprene, 80 - 90 Shore A durometer hardness to ASTM D 2240, to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene, 50 - 60 Shore A durometer hardness to ASTM D 2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape:
.1 Preformed butyl compound with integral resilient tube spacing device, 10 - 15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; black colour.

.4 Glazing splines: resilient polyvinyl chloride, extruded shape to suit glazing channel retaining slot, colour as selected.

.5 Glazing clips: manufacturer's standard type.

.6 Lock-strip gaskets: to ASTM C 542.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.1 EXAMINATION (Cont'd)

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

3.2 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

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

.3 Prime surfaces scheduled to receive sealant.

3.3 INSTALLATION: EXTERIOR WET/DRY METHOD (PREFORMED TAPE AND SEALANT)

.1 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.

.2 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.

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

.4 Rest glazing on setting blocks and push against tape with sufficient pressure to attain full contact at perimeter of light or glass unit.

.5 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line.

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

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

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

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

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

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

.4 Place glazing tape on free perimeter of glazing in same manner described in 3.4.3.

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

.6 Knife trim protruding tape.

3.5 CLEANING

.1 Remove glazing materials from finish surfaces.

.2 Remove labels after work is complete.

.3 Clean glass and mirrors.

3.6 PROTECTION OF FINISHED WORK

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

END OF SECTION