1 GENERAL

1.01 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 06 10 00 – Rough Carpentry.

.3 Section 07 92 10 - Joint Sealing.

.4 Section 08 71 10 - Door Hardware.

.5 Section 08 80 50 - Glazing.

.6 Section 09 91 23 - Interior Painting.

.7 Electrical Division - Wiring for electronic hardware.

1.02 REFERENCES

.1 American Society for Testing and Materials (ASTM International)
- .1 ASTM A 653/A653M-15e1, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B 29-14, Specification for Refined Lead.
- .3 ASTM B 749-14, Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
- .2 CGSB 41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)
- .1 CSA G40.20-13/G40.21-13, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W59-13, Welded Steel Construction (Metal Arc Welding) (Metric Version).

.4 Canadian Steel Door Manufacturers' Association, (CSDMA).
- .1 CSDMA, Specifications for Commercial

Steel Doors and Frames, 2012.

.2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 2012.

.5 National Fire Protection Association (NFPA)

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

.2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC)

.1 ULC 105, Fire Tests of Door Assemblies.

.2 ULC 105, Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.

.7 ULC-701, Thermal Insulation, Polystyrene, Boards and Pipe Covering.

.8 ULC-702, Thermal Insulation, Mineral Fibre, for Buildings.

.9 ULC-704, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

1.03 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.

1.04 SHOP DRAWINGS

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

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

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

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

1.05 REQUIREMENTS

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M, NFPA 252 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 ULC 105, ASTM E 152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

2 PRODUCTS

2.01 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A 653M, ZF75, minimum base steel thickness in accordance with CSDMA Table 1 - Thickness for Component Parts.

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A 653M, ZF75.

2.02 DOOR CORE MATERIALS

.1 Honeycomb construction: Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m^2 minimum sanded to required thickness.

.2 Reinforce and insulate doors (for exterior use):
.1 Preformed rigid insulation core completely filling the door cavity and permanently bonded to the steel door skins with a thermosetting adhesive.
.2 Polyisocyanurate to CGSB 51-GP-21M modified poly/isocyanurate, closed cell board. Density 32 kg/m^2.

2.03 ADHESIVES

.1 Select Adhesives which:
.1 Do not contain volatile organic compounds

in excess of 5% by weight as measured by EPA Method 24-24A, 40 C.F.R, Part 60, Appendix A, Environmental Protection Agency Method 8240 GC/MS Method for Volatile Organics, September 1986;

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

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

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

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

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

2.04 PRIMER

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

2.05 PAINT

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

2.06 ACCESSORIES

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

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

.3 Fabricate glazing stops as formed channel, minimum 16mm height, for commercial grade doors accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.

.4 Fire labels: metal riveted.

.5 Glazing: Refer to Section 08 80 50.

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

.7 Make provisions for glazing as indicated and provide necessary glazing stops as indicated.
.1 All glazing stops to be tamperproof.

.8 Machine screws: use only Security Torx on exposed surfaces.

2.07 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDMA specifications.

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

.3 Exterior frames: 1.6mm thermally broken type construction.

.4 Interior frames: 1.6mm welded type construction.

.5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames across the head, where a closer is to be installed with a continuous 6mm thick steel plate welded to both sides of frame. Reinforce frames at each hinge and strike point with a minimum 6mm steel plate of sufficient length to be welded at each end of hinge and strike opening. Reinforce heads of frames wider than 1200mm.

.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.

2.08 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 1500mm and 1 additional anchor for each additional 750mm of height or fraction thereof.

2.09 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

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

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

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

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

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

2.10 DOOR FABRICATION

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

.2 Exterior doors: hollow steel, insulated construction. Interior doors: honeycomb construction.

.3 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.

.4 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.

.5 Prime paint doors after fabrication.

.6 Manufacturer's nameplates on doors are not permitted.

.7 Factory prepare holes 12mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

.8 Bevel hinge and lock edges of doors 3mm in 50mm. Provide the active leaf of each set of double doors complete with a steel astragal mounted on the edge of the door.

.9 Supply doors complete with openings for glass to sizes shown on drawings. Glazing stops to be 1.6mm sheet metal, screw fixed. Provide steel ventilation louvre opening to suit sizes as shown on drawings.

.10 Construct any matching panels required in same manner as doors.

.11 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.

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

.13 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104 ASTM E 152 or 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.

2.11 DOORS: HONEYCOMB CORE CONSTRUCTION

.1 Form each face sheet for exterior doors from 1.6mm sheet steel with honeycomb, polystyrene, polyurethane, core laminated under pressure to face sheets.

.2 Form each face sheet for interior doors from 1.6mm sheet steel with honeycomb, temperature

rise rated, core laminated under pressure to face sheets.

2.12 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.

3 EXECUTION

3.01 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.

3.02 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 1200mm wide. Remove temporary spreaders after frames are built-in.

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

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

.6 Maintain continuity of air barrier and vapour retarder.

.7 Silicone in place rubber door stops.

3.03 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: 0.8mm.
.2 Latchside and head: 1.6mm.
.3 Finished floor, and thresholds: 12mm.

.3 Adjust operable parts for correct function.

3.04 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.

3.05 GLAZING

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

END OF SECTION

1 GENERAL

1.1 RELATED SECTIONS

.1 Section 07 26 00 – Vapour Barriers.

.2 Section 07 92 10 – Joint Sealant.

.3 Section 08 80 50 - Glazing.

.4 Section 09 91 13 – Exterior Painting.

1.2 REFERENCES

.1 Canadian Standards Association (CSA)
- .1 CAN/CSA-A440-00, Windows.
- .2 Insulating Glass Manufacturers Alliance (IGMA).

.2 IGMAC Certification Program for manufacturers of insulating glass units.

1.3 SUBMITTALS

.1 Submit in accordance with Section 01 33 00

.2 Shop Drawings: Submit shop drawings, indicating dimensions, construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

.3 Samples:

1. Submit one complete full size window sample of each type window.
2. Include frame, sill, glazing and weatherproofing method, surface finish and hardware. Show location of manufacturer's nameplates.
3. Include 150 mm long samples of head, jamb, sill, to indicate profile.
4. Submit test reports from approved independent testing laboratories indicating results from testing in accordance with CSA-A440.
5. Provide operation and maintenance data for windows.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Delivery: Deliver materials to site undamaged in manufacturer's or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.

.2 Storage: Store materials off ground, under cover, and protected from weather, direct sunlight, and construction activities.

.3 Handling: Protect materials and finish during handling and installation to prevent damage.

1.5 WARRANTY

.1 Windows shall be warranted to be free from defects in manufacturing, materials and workmanship for a period of ten (10) years from purchase date.

2 PRODUCTS

2.1 MATERIALS

.1 Materials: to CSA-A440/A440.1 supplemented as follows:

.1 All fiberglass windows by same manufacturer.
.2 Main frame: fiberglass

.2 Exterior Aluminum Sills: Extruded aluminum of type and size as detailed; minimum 3 mm thick, continuous length, complete with anchors and anchoring devices. Finish as selected by Departmental Representative from full range without restrictions

.3 Isolation coating: alkali resistant bituminous paint.

.4 Glazing:

.1 Insulating glass unit manufacturer to be a member of IGMA Certification Program.
.2 Insulating glass units: double unit, clear float, low-E, argon gas-filled.

2.2 WINDOW TYPE AND CLASSIFICATION

.1 Type: Fixed: with double glazing, insulating glass units.

.1 Acceptable material: As manufactured by Norwood, Inline Fibreglass or an acceptable alternate.

.2 Colour to be selected by Departmental Representative from manufacturers extended colour range.

.2 Classification rating: to CSA-A440/A440.1.

.1 Water tightness: B7.

.2 Wind load resistance: C4.

.3 Condensation resistance: Temperature Index, I 60.

.4 Forced Entry: F2.

.5 Glazing: G2.

2.3 INSTALLATION ACCESSORIES

.1 Insulating-Foam Sealant: Low-pressure, low expansion, polyurethane foam sealant to Section 07 21 00.

.2 Transition Membrane: refer to Section 07 27 00.

.3 Installation Brackets: Factory installed anchors for installation in openings, galvanized finish.

2.4 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 supplemented as follows:

.1 Fabricate units square and true with maximum tolerance of plus or minus 1.5 mm for units with a diagonal measurement of 1800 mm or less an plus or minus 3 mm for units with a diagonal measurement over 1800 mm.

.2 Face dimensions detailed are maximum permissible sizes.

.3 Brace frames to maintain squareness and rigidity during shipment and installation.

.4 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40.

3 EXECUTION

3.1 EXAMINATION

.1 Examine openings to receive windows. Notify Departmental Representative of conditions that would adversely affect installation.

.2 Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 WINDOW INSTALLATION

.1 Install in accordance with CAB/CSA-A440.

.2 Sills:

.1 Install prefinished metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece at each location.

.2 Cut sills to fit window opening.

.3 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm on centre in between.

.4 Fasten with self tapping stainless steel screws.

.3 Assemble and install window unit according to manufacturer's instructions and reviewed shop drawings.

.4 Integrate window installations with air/vapour barrier using transition membrane specified at Section 07 27 00.

.5 Seal around window perimeter to maintain continuity of thermal barrier using insulating-foam sealant.

.6 Paint exterior sashes, muntins and head/sill/jamb extensions in accordance with Section 09 91 00.

3.3 CAULKING

.1 Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly in accordance with Section 07 92 00.

3.4 CLEANING

.1 Clean window frames and glass.

.2 Do not use harsh cleaning materials or methods that would damage finish.

.3 Remove labels and visible markings.

3.5 PROTECTION

.1 Protect installed windows to be without damage at time of Substantial Completion.

END OF SECTION

PART 1 - GENERAL

1.1 Related Work

.1 Section 06 10 10 - Rough Carpentry.

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

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, NFPA 80 and ANSI/BHMA.

.2 BHMA A156.1-2013, Butts and Hinges.

.3 BHMA A156.3-2014, Exit Devices.

.4 BHMA A156.4-2013, Door Controls (Closers).

.5 BHMA A156.5-2014, Auxiliary Locks and Associated Products.

.6 BHMA A156.6-2016, Architectural Door Trim.

.7 BHMA A156.7-2014, Template Hinge Dimensions.

.8 BHMA A156.8-2015, Door Controls - Overhead Holders.

.9 BHMA A156.18-2016, Materials and Finishes.

.10 BHMA A156.21-2014, Thresholds.

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.

.2 Indicate specified hardware, including

make, model, material, function, size, finish and other pertinent information.

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 the beginning and end of Work, 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 of the 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.

.3 All hardware to be supplied by same supplier. Acceptable suppliers are Apex, Capital Safe and Lock, Atlantic Hardware or an approved alternate.

2.2 Door Hardware

.1 Butts and hinges to ANSI/BHMA A 156.1. 3 Butts per door panel unless indicated otherwise:

.1 Listed in Hardware Schedule (A1):

.1 Stainless steel, full mortise, templated, ball bearing, 5 knuckle, standard weight, self lubricating bearing, size 112 x 112mm, finish to ANSI 626.

.1 Acceptable product: McKinney TA2314, Hager BB1199,or an approved alternate.

.2 Listed in Hardware Schedule (A3):

.1 Stainless Steel, full mortise, templated, 5 knuckle, 2 permanently lubricated ball bearings, non-removable pin (NRP),112 x 112mm finished to ANSI 626.

.1 Acceptable product: McKinney TA2314, Hager BB1191, Stanley FBB191, or an approved alternate.

.2 Locksets:

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

.1 Heavy duty locksets to ANSI A156.2, Series 1000, grade 1.

.2 Functions are as follows:

.1 ANSI F01 -Passage Set.

.2 ANSI F04 -Office Function.
.3 ANSI F05 -Classroom.
.4 ANSI F07 -Storeroom Function.
.5 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 keyed into grand master system.
.7 Finished to ANSI 626.
.8 Acceptable product: Sargent 8200, Schlage L9000, Corbin-Russwin ML2000.

.3 Exit devices:
.1 Listed in Hardware Schedule:
.1 To ANSI/BHMA A156.3, Grade 1, modern-stile, Lexan touchpad on push rail, cast strike, rim surface mounting, lever handle to be solid tubular in design, function as listed, finish as listed.
.1 Acceptable product: Sargent 8800 x ETJ, Corbin ED5200, Yale 7100, or an approved alternate.
.2 Listed in Hardware Schedule:
.1 To ANSI/BHMA A156.3, Grade 1, modern-stile, Lexan touchpad on push rail, cast strike, vertical rod mounting, lever handle to be solid tubular in design, function as listed, finished to ANSI 626 as listed.
.1 Acceptable product: Sargent 8700 x ETJ, or an approved alternate.

.4 Door Closers:
.1 Listed in Hardware Schedule (D1):

.1 Door controls (closers): to ANSI/BHMA A156.4, Grade 1, heavy duty, non handed, mounting as listed, aluminum body with plastic cover, adjustable through ranges 1 to 6, adjustable backcheck and delayed action, finished to ANSI 689.
.2 Accessory mounting plates as listed.
.3 Acceptable product: Sargent351, Corbin DC2200, Norton 7500, or an approved alternate.

.2 Listed in Hardware Schedule (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 2 to 6, adjustable backcheck and delayed action, finished to ANSI 689.
.2 Acceptable product: Sargent 1430, Corbin DC3200, Norton 8501, or an approved alternate.

.5 Folding Door Hardware (D1):
.1 Bi-folding hardware: Double leg aluminum track, surface mounted components listed in above standard for door weight.
.2 Acceptable product: K.N. Crowder C-515 complete with C-204 track.

.6 Auxiliary Trim & Devices:
.1 Listed in Hardware Schedule (E2):
.1 Pushplate to ANSI/BHMA A156.6, 100 x 400 x 1.6mm thick stainless steel, screw attached, finished to ANSI 630.
.2 Acceptable product: Standard Metal Hardware Manufacturing H413, or an approved alternate.
.2 Listed in Hardware Schedule (E3):
.1 Kickplate to ANSI/BHMA A156.6, 18 ga.thick stainless steel by door width less 50mm long,size as listed, screw attached,

finished to ANSI 630.

.2 Acceptable product: Standard Metal Hardware Manufacturing K10A, or an approved alternate.

.3 Listed in Hardware Schedule (E4):

.1 Door Pull to ANSI/BHMA A156.6, stainless steel "D" pull, round 19 x 900mm profile, finished to ANSI 630.

.2 Acceptable product: Standard Metal Hardware Manufacturing 2409, or an approved alternate.

.4 Door controls: Stops and overhead holders: Listed in Hardware Schedule:

.1 Wall stop (G1) to ANSI/BHMA A156.8, Zinc die cast, circular shape, concave rubber insert, concealed mounting, 63mm diameter x 25mm projection, finished to ANSI 626.

.2 Acceptable product: Standard Metal Hardware Manufacturing S122, DCI 3211,or an approved alternate.

.5 Listed in Hardware Schedule:

.1 Overhead stop (G2) release devices to ANSI/BHMA A156.8, standard duty, non-friction stop type, concealed mounted, extruded bronze track, extruded bronze arm, non-handed, sized for door leaf width, finished to ANSI 626.

.2 Acceptable product: Sargent 1530S, Rixson 5,or approved alternate.

.6 Listed in Hardware Schedule (E5):

.1 Flush bolts to BHMA A156.16, cast brass or bronze, 150mm long, wrought brass pin 25mm throw, spring holds bolt in either open or closed position, dust proof strikes, finish to ANSI 626.

.2 Acceptable product: Hager HA1250, Standard Metal Hardware Manufacturing F65.

.7 Thresholds:

.1 Listed in Hardware Schedule (F1):

.1 To ANSI/BHMA A156.21, extruded aluminum threshold, with

continuous vinyl barrier,135 x 22mm high x full width of door opening, mill finish.

.2 Acceptable product: Draft Seal DS177X5TB, K.N. Crowder CT-49, Zero, or approved alternate.

.8 Weatherstrip Set:

.1 Listed in Hardware Schedule:

.1 Head and jamb seal (F2):

.1 Extruded aluminum frame 36mm width, sponge neoprene insert, clear anodized finish.

.2 Acceptable product: Draft Seal DS132C, K.N. Crowder W-15, Zero, or approved alternate.

.2 Door bottom seal (F3):

.1 Extruded aluminum frame 36mm width and rubber sweep, clear anodized finish.

.2 Acceptable product: Draft Seal DS138C, K.N. Crowder W13S, Zero, or approved alternate.

.3 Head and jamb seal (F4):

.1 Extruded aluminum, synprene insert, clear anodized, 44mm width.

.2 Acceptable product: Draft Seal DS118C, K.N. Crowder W20N, Zero, or an approved alternate.

.9 Automatic door operators:

.1 Listed in Hardware Schedule as I1:

.1 Door swing operator, aluminum operating housing, AC electric motor, connection wiring harness, operator assembly, swing arm, and electronic control.

.2 Operator: Electro-hydraulic, self contained operator, powered by a 1-6 hp motor.

.3 Electronic control: Self contained, solid state integrated circuit controls the

operations and switching of the swing power operator.

.4 Connecting hardware: Surface mounted hardware is connected to the door by means of die cast aluminum door arm.

.5 Power open: Automatic door operator is powered open by force transmitted to the hydraulic servo to operate and through adjustable arm linkage to the door.

.6 Spring close: The automatic door operator is spring closed. The spring in non-handed and returns the door to full close.

.7 Finish: Operator housing and arm to match aluminum door / frame colour.

.10 Miscellaneous electrical hardware:

.1 Listed in Hardware Schedule as J1:

.1 Electric strike to ANSI/BHMA E59371, 12V, stainless steel, non-handed, plug connectors, fail safe, entry buzzer.

.2 Acceptable product: Von Duprin 6114, HES, or an approved alternate.

.2 Listed in Hardware Schedule as J2:

.1 Power supply 3520 by Sargent or an approved alternate.

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 Doors and cabinet locks to be grand master keyed. Prepare detailed keying schedule in conjunction with Consultant.

.2 Provide keys in duplicate for every lock in this Contract.

.3 Provide three masterkeys for each MK or GMK group.

.4 Stamp keying code numbers on keys and cylinders.

.5 Provide construction cores.

.6 Provide, and install all permanent cores, cylinders, and keys.

.7 Provide keys in triplicate for every lock in this Contract.

.8 Provide three masterkeys.

2.5 MISCELLANEOUS HARDWARE

.1 Indexed key control system: to CAN/CGSB-69.21-M90, wall mounted system, type multiple panel, enamel paint finish. Allow for 50% expansion.

.2 Engraved Plastic Plate Signs: 3mm thick acrylic, two colours, reverse engraved, international symbols for Barrier Free and Washrooms, lettered for room names all other locations and Room number.

.1 Acceptable product: PMI, ASI, Hager or approved equal.

.2 Schedule: as follows:

.1 200 x 200mm signs with Barrier Free symbols on all barrier free washroom doors.

.2 50 x 100mm door frame numbers(All openings). Numbering to conform to drawings.

.3 50mm x length to suit for room names.

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.

.5 Install key control cabinet.

3.2 Schedule

.1 See Schedule of Hardware for Hardware Sets on each door.

END OF SECTION

DOOR No	HINGES	LOCKSET	EXIT DEVICE	PUSH/PULL	CLOSER	STOP	BOLTS	ELECT. MISC.	MISC.	NOTES
D001	A3	F04			D1	G2	E5		F2, F3	1
D003	A1	F19				G1				
D004	A1	F07			D1	G1				
D005	A1	F07			D1	G1				
D006	A3	F07			D1	G2				
D007	A1	F01			D1	G1				
D101	A3		8813 x ETL		D1	G2	E5		F2, F3, I1	1
D101A	A3		8813 x ETL		D1	G2			F2, F3	
D103	A1									2
D105	A3	F04			D1	G1				
D106	A3		8810		D1	G2			F2, F3	
D107										3
D108	A1	F19				G1				
D109	A1	F19				G1				
D110	A1	F04			D1	G1				

1. All hardware noted to be for pair of doors
2. 2-pair hinges.
3. Track/hardware/pull for bi-fold door by KN Crowder.

1 GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 78 00 - Closeout Submittals.

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

.4 Section 08 50 50 - Windows.

1.2 REFERENCES

.1 American National Standards Institute (ANSI).
.1 ASTM E330/E330M-14, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.2 American Society for Testing and Materials International, (ASTM).
.1 ASTM C 542-05(2011), Specification for Lock-Strip Gaskets.
.2 ASTM D 2240-15, Test Method for Rubber Property - Durometer Hardness.
.3 ASTM E 84-16, Test Method for Surface Burning Characteristics of Building Materials.

.3 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-12.4-M91, Heat Absorbing Glass.
.4 CAN/CGSB-12.8-97, Insulating Glass Units.
.5 CAN/CGSB-12.9-M91, Spandrel Glass.
.6 CAN/CGSB-12.11-M90, Wired Safety Glass.

.4 Environmental Choice Program (ECP).
.1 UL 2761, Sealants and Caulking Compounds.

.5 Laminators Safety Glass Association (LSGA).
.1 LSGA Laminated Glass Design Guide.

1.3 SYSTEM DESCRIPTION

.1 Performance Requirements:
.1 Provide continuity of building enclosure vapour and air barrier using glass and glazing materials as follow:
.1 Utilize inner light of multiple light

sealed units for continuity of air and vapour seal.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads as measured in accordance with ANSI/ASTM E330.

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

1.4 SUBMITTALS

.1 Product Data:

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

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 33 00 - Submittal Procedures. Indicate VOC's:

.1 For glazing materials during application and curing.

.2 Shop Drawings:

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

.3 Samples:

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

.2 Submit duplicate 610 x 610mm size samples and sealant material.

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.5 Closeout Submittals:

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

1.5 QUALITY ASSURANCE

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

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

.3 Mock-ups:
.1 Construct mock-up to including glass glazing, and perimeter air barrier and vapour retarder seal.
.2 Mock-up will be used:
.1 To judge workmanship, substrate preparation, operation of equipment and material application.
.3 Locate where directed.
.4 Allow 24 hours for inspection of mock-up before proceeding with work.
.5 When accepted, mock-up will demonstrate minimum standard of quality required for this work. Approved mock-up may remain as part of finished work.

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

1.6 SITE CONDITIONS

.1 Environmental 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.

1.7 WARRANTY

.1 Provide a written guarantee for all insulating units. Manufacturer's written guarantee shall be for a period of 5 years.

2 PRODUCTS

2.1 MATERIALS: FLAT GLASS

.1 Safety glass: flat laminated safety glass: AS2 .0152.

2.2 MATERIALS:
SEALED INSULATING GLASS

.1 Insulating glass units: to CAN/CGSB-12.8, double unit, 2 sheets of 6 mm laminated safety glass with 12 mm air space argon filled and low-E coated, total thickness of 25 mm.
.1 Fibreglass windows shall have a maximum

U-factor of 0.45.

.2 All exterior windows shall have a VLT/SHGC ratio greater than 1.5.

2.3 MATERIALS

.1 Sealant: Refer to Section 07 92 10 - Joint Sealing.

2.4 ACCESSORIES

.1 Setting blocks: Neoprene. Shore A durometer hardness to ASTM D 2240, length of 25 mm for each square meter of glazing.

.2 Spacer shims: Neoprene, Silicone, 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, black colour.

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

3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

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

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

3.3 PREPARATION

.1 Clean contact surfaces with solvent and wipe dry.

.2 Seal porous glazing channels or recesses with

substrate compatible primer or sealer.

.3 Prime surfaces scheduled to receive sealant.

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

.1 Perform work in accordance with FGMA Glazing Manual IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.

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

.3 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.

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

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

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

.7 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing, maximum 10mm below sight line.

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

3.5 INSTALLATION: INTERIOR
DRY METHOD (TAPE AND TAPE)

.1 Perform work in accordance with FGMA Glazing Manual IGMAC and Laminators Safety Glass Association - Standards Manual for glazing installation methods.

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

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

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

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

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

.7 Knife trim protruding tape.

3.6 CLEANING

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

.2 Remove traces of primer, caulking.

.3 Remove glazing materials from finish surfaces.

.4 Remove labels after work is complete.

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

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

3.7 PROTECTION OF FINISHED WORK

.1 After installation, mark light with an "X" by using removable plastic tape or paste.

3.8 SCHEDULE

.1 Install glazing at the following locations:
- .1 Exterior entrance and exit doors shall be 25 mm thermo units as outlined above.
- .2 Exterior windows shall be 25 mm thermo units as outlined above.
- .3 Interior entrance and exit doors shall have 6 mm laminated safety glass.
- .4 Interior doors and windows shall have 6 mm laminated safety glass.

END OF SECTION