
1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American Society for Testing and Materials (ASTM)
 - .1 ASTM A307-12, Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength.
 - .2 ASTM A325-10, Standard Specification for Structural Bolts, Steel, Heat Treated 120/105 Ksi Minimum Tensile Strength.
- .3 Canadian Standards Association (CSA)
 - .1 CSA G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel
 - .2 CSA W47.1-09, Certification of Companies for Fusion Welding of Steel
- .4 National Fire Protection Association (Agency) (NFPA)
 - .1 NFPA 80-2013, Standard for Fire Doors, and Other Opening Protectives
- .5 UL-Underwriters' Laboratories/ULC-Underwriters' Laboratories of Canada (UL/ULC)
 - .1 CAN/ULC-S104-10- EN, Standard Method for Fire Tests of Door Assemblies
 - .2 CAN/ULC-S105-09-EN, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC- S104
 - .3 CAN/ULC-S701-11- EN, Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering
 - .4 CAN/ULC-S705.1-01-AM3- EN, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material – Specification

1.2 Design criteria

- .1 Window W10: window metal frame, its glazing and the complete assembly must be designed to withstand NBC's specified lateral loads for balcony guards.

1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 Shop drawings :
 - .1 For each door, indicate also variations in height for floor to ceiling frames, due to variations in slab level.
 - .2 Include a schedule showing all doors identified on **drawings** and **Door and Frame Schedule**.
 - .3 Window W10 : shop drawings shall be stamped and signed by professional engineer, who is a member in good standing of the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG) and must attest conformity to **Design criteria**.
 - .2 Proof of qualifications:
 - .1 Provide proof of qualification for the following:

- .1 Welders: to be accredited from the Canadian Welding Bureau, in accordance to CSA W47.1 requirements.

1.4 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 Steel doors and frames, in galvanised steel, as per Canadian Steel Door and Frame Manufacturers Association "Canadian Manufacturing Specifications for Steel Doors and Frames".
- .2 See **Section 08 14 16** for wood doors used with metal frames.
- .3 See **Section 08 71 00** for related hardware.

2.2 Materials

- .1 See **Section 05 05 00** for basic metal materials.
- .2 **Hot Dipped Galvanized Steel Sheet:** to ASTM A 653M, ZF75 Zinc Plated; minimum thickness of bare metal conforming to CSDMA standard, Table 1 - Thickness for Component Parts. Use galvanized elements for interior and exterior frames and doors.
- .3 **Cold Rolled Steel Sheet :** Commercial Grade, ZF001 Zinc Plated to A366 Standard, Matte Finish, CGSB 1-GP-181 Primer.
- .4 **Profiles and reinforcements:** in steel conforming to CSA G40.20 / G40.21, grade 44W, ZF75 zinc plated to ASTM A 653M
- .5 **Steel reinforcement and floor anchors:** as per CAN/CSA-G40.20/G40.21, Grade 44W, with galvanized finishes similar to the frames, minimum 1.6 mm (0.060" / 16 ga) base thickness.
- .6 **Bolts and anchorbolts:** as per ASTM A307.
- .7 **High strength bolts:** as per ASTM A325M and A325.
- .8 **Exposed fasteners:** same material and finish as material through which they pass. Screws to be flat headed.
- .9 **Door bumpers:** grey closed cell neoprene.
- .10 **Glazing stops:** commercial grade sheet steel, 0.91 mm (20 ga.) minimum base thickness, screw fixed.
- .11 **Door primer :** compliant to CGSB 1-GP-181M.

- .12 All other door and frame elements as per CSDFMA requirements and the manufacturer's recommendations.

2.3 Doors and Frames

- .1 **Steel doors and frames:** All project steel doors and frames will be ZF75 galvanized steel.
- .2 **Exterior doors and frames:**
 - .1 Thickness of the base metal of the walls of the exterior elements:
 - .1 Doors: 14 gauge
 - .2 Frames: 14 gauge
 - .2 Cores of doors: Polyurethane core: Rigid polyisocyanurate rigid closed-cell panel with a density of 32 kg / m³ according to CGSB 51-GP-21M. RSI factor of 1.65.
 - .3 Door frames: Commercial grade steel section, with thermal breakage.
- .3 **Interior doors and frames (including Window W10 frame):**
 - .1 Thickness of base metal of walls of interior elements:
 - .1 Doors: 14 gauge
 - .2 Frames: 14 gauge
 - .2 Door frames: Commercial grade steel, with or without fire resistance.
 - .3 Core of doors: "Honeycomb" core, with cells of not more than 24.5 mm, of Kraft paper, having a mass of not less than 36.3 kg per ream and a density of not less than 16.5 kg / m³, sanded to the required thickness.
- .4 **Ground anchors, stiffening wedges and wall anchors:** Steel minimum 1.6 mm thick.
- .5 **Fire rating of doors and window (thermal protection rating):** the material of the door core must be able to limit the heating obtained on the unexposed side of the door at 250 ° C for 60 minutes. The core shall be tested as an integral part of the door in accordance with CAN4-S104, ASTM E 152 or NFPA 252 for door fire performance testing and shall be approved by a recognized testing agency nationally and providing a factory inspection service.

2.4 Accessories

- .1 **Adhesives:**
 - .1 Polystyrene and polyurethane cores: heat-resistant contact adhesive based on epoxy resins, low viscosity.
 - .2 Staple gaskets: Polychloroprene-based adhesive / fire-resistant sealant with built-in resin filler, high viscosity.

-
- .2 **Primer:** Rustproofing paint complies with CAN / CGSB-1.181 and complies with Green Seal GS-11.
 - .3 **Painting :** Steel doors and frames to be painted on site in accordance with **Section 09 91 00**. The cutters must not be painted. Finished surfaces must be free from scratches or other imperfections.
 - .4 **White self-adhesive rubber band:** around door frames where indicated on drawings.
 - .5 **Shock absorbers for doors:** single stud, neoprene rubber.
 - .6 Glazes shall be fabricated from shaped sections at least 16 mm high; they must be properly fitted, butted at the corners and fastened to the frame elements by means of countersunk head screws.
 - .7 **Metal filler:** according to manufacturer's specifications.
 - .8 **Fire certification labels:** secured with metal rivets.
 - .9 **Sealant:** see **Section 07 92 00 - Joint Sealants**.
 - .10 **Glazing:** see **Section 08 80 50 - Glazing**.
 - .11 Provide glazing, as indicated, and provide the necessary glazing beads.
 - .12 Glazing shall be secured with removable steel glazing beads of the same finish as doors for use with glazing tape and putty, and fastened with countersunk stainless steel screws.
 - .13 Identification for each of the doors, see **architecture drawings**.

2.5 Fabrication - General

- .1 Fabricate steel doors and frames as detailed, with galvanized steel, as detailed, in accordance with Canadian Steel Door Manufacturer's Association standards, for hollow steel and honeycomb core construction, except where specified otherwise.
- .2 Check dimensions of all openings and ensure that the floor is flat and level under the doors before starting installation.
- .3 Obtain from suppliers of finish hardware (**Section 08 71 00**) and security systems hardware (**Section 08 71 00 / Electricity**) templates and related information to mortise, reinforce, drill and tap doors and frames to receive hardware and wiring, as **necessary**.
- .4 Shop prime structural steel and reinforcing members.
- .5 Touch-ups to be done in shop wherever the zinc coating is damaged.
- .6 All screw heads to be concealed with metal putty and ground smooth.
- .8 Fabricate fire resisting doors and frames as per CAN/ULC-S104 and CAN/ULC-S105, and label and list by an organization accredited by Standards Council of Canada; provide certification for

oversized doors and frames, as mentioned in **Submittals** above.

- .10 Install louvres in plant.

2.6 Fabrication of Frames

- .1 Unless otherwise indicated, cut mitres and joints accurately and weld continuously on inside of frame profile. No knock down frames are acceptable.
- .2 Exposed welds shall be continuous for full length of each joint.
- .3 Grind welded corners, joints and all exposed welds to flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .4 Provide jamb anchors for fixing at floors
- .5 Provide jamb anchors for fixing to walls: 4 anchors in gypsum walls for doors up to 2286 mm high, 5 anchors for doors up to 2440 mm high, and more as required for higher doors. Install double anchorages to prevent torsions, and spacers to insure a clearance of 15 mm between the back of the frame and the supporting surface, where applicable.
- .6 Install 3 neoprene bumpers on strike jamb for each single door and 2 bumpers per door at head for pairs of doors. Fix bumpers with adhesive, do not insert in pre-pierced holes.
- .7 Make provision for glazing and provide necessary glazing stops, as indicated.
- .8 Unless otherwise shown, weld an anchor at every 610 mm on the jambs.
- .9 Reinforce head of frames wider than 1220 mm.
- .10 Arc weld to the frames all casings and reinforcing plates for hardware.
- .11 Where indicated, provide sanitary bases and stops.
- .12 Install temporary stiffeners during transport.

2.7 Fabrication of Doors

- .1 Mechanically interlock or weld together the metal sheets and adhere the vertical edges with adhesive. Apply spot welding at the corners, above and below all hardware cut-outs and on complete height at not more than 305 mm spacing. All spot welding on vertical edges to be ground and sanded to uniform smooth finish.
- .2 Both vertical edges of single or double doors, active and inactive leaves to be bevelled.
- .3 Prepare the openings for glazing, as indicated, and provide glazing stops.

2.8 Shop Cleaning and Priming

-
- .1 Clean surfaces in accordance with SSPC-SP2 or a higher grade, as required.
 - .2 Ensure no fabrication oil remains on galvanized surfaces.
 - .3 Shop apply a coat of primer, in addition to the galvanization, compatible with the paint or special coating to be applied on site.
 - .4 Apply the primer as prepared by the manufacturer, without any modification. Apply it on surfaces which are dry, without rust, oil or flakes. Do not apply at temperatures below 7°C.

3.0 EXECUTION

3.1 General

- .1 Prepare doors and frames to receive the electronic hardware, in coordination with **Departmental Representative and Electrical**.
- .2 Isolate steel from direct contact with dissimilar metals and concrete.
- .3 Install doors after the installation of finishes.
- .4 Install labelled fire-rated frames and doors according to the National Fire Code and NFPA 80 requirements.
- .5 Install accessories as indicated.

3.2 Installation of Frames

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Secure anchors and connections to adjacent construction.
- .3 Brace frames and partitions rigidly in position while building-in. Install temporary horizontal wood spreaders at third points of door opening to maintain frame width. Provide vertical support at centre of head for openings over 1220 mm wide. Remove temporary spreaders after frames are built-in.
- .4 Make allowance for deflection to ensure structural loads are not transmitted to frames.
- .5 Connect exterior door frames to the air/vapour barrier system of the building with compatible membrane. Seal all edges of the membrane, if necessary.
- .6 Install insulation as per **Section 07 20 00** into all exterior door frames, and assure all empty spaces are filled.
- .7 Seal around frames – See **Section 07 92 00**.

3.3 Installation of Doors

- .1 Install doors and hardware in accordance with door schedule, hardware templates and

manufacturer's instructions.

- .2 Provide even margins between doors and jambs, between leaves and between doors and finished floor and thresholds as follows:
 - .1 Sides, top and between leaves: 3.2 mm ± 1.6 mm.
 - .2 Bottom: 19 mm, adjusted to threshold profiles, if necessary.
- .3 Adjust operable parts for correct function.

3.4 Installation of Glazing

- .1 Ensure all finishes are fully dry before installing the glazing.
- .2 Ensure glazing is clean and dry prior to installation.
- .3 Install glazing as specified - See **Section 08 80 50**.

3.5 Insulation of Door Frames

- .1 Place insulation into the void of the insulated door frame and where indicated for interior and exterior doors.
- .2 Ensure that the door frame is entirely filled with insulation without voids or empty spaces.
- .3 To insure the continuity of the thermal protection of the building envelope, fill completely the gap between the exterior door frames and adjacent surfaces with flexible insulation, see **Section 07 20 00** and sealant, see **Section 07 92 00**.

3.6 Finish

- .1 See **Sections 09 91 00**.

3.7 Touch-ups

- .1 Touch up with primer any galvanized finish which is damaged during transport and installation.

3.8 Adjustment

- .1 Re-adjust doors and hardware to function freely and properly, just prior to completion of work and after the final air balancing of the building.

3.9 Cleaning

- .1 Perform cleaning as per **Section 01 74 11**.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American National Standards Institute (ANSI)
 - .1 ANSI A208.1-2009, Particleboard
- .3 AWI / AWMAC / WI
 - .1 Architectural Woodwork Standards, 1st edition, 2009
- .4 National Fire Protection Association (Agency) (NFPA)
 - .1 NFPA 80-2013, Standard for Fire Doors, and Other Opening Protectives
- .5 UL-Underwriters' Laboratories/ULC-Underwriters' Laboratories of Canada (UL/ULC)
 - .1 CAN/ULC-S104-10- EN, Standard Method for Fire Tests of Door Assemblies
 - .2 CAN/ULC-S105-09-EN, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC- S104

1.2 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 **Shop drawings:**
 - .1 Include a schedule identifying each opening using the same identification codes as on the **drawings**.
 - .2 Indicate also variations in height, for floor to ceiling frames, due to variations in slab level, if applicable.

1.3 Handling and Storage

- .1 Supply all doors in water resistant protective covering, with especially protected corner.
- .2 All doors shall be stored inside a dry, warm atmosphere, away from damp surfaces. Stock-pile horizontally, on a flat surface raised above the floor. Top of the pile to be covered with plywood, polyethylene film, wax paper or other acceptable moisture resistant covering.
- .3 Doors shall not be subjected to extremely high or low heat or humidity. Ensure that previous to delivery, doors have been kept in environmental conditions similar to those to be found on site.

1.4 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 Wood doors should not contain added urea formaldehyde.
- .2 See **Sections 05 50 00** and **06 40 00** for metal, wood, or aluminium trims related to doors of this Section.
- .3 See **Section 08 11 00** for metal frames used with wood doors.
- .4 See **Section 08 71 00** for related hardware.

2.2 Wood Doors

- .1 **Type WD1 –Wood doors** - Particle core, ultra heavy-duty, anti-warping construction for intensive use: standard flush doors, 5 ply, having the following characteristics:
 - .1 Core: Solid particleboard. Density of 28-32 lbs per cubic foot. Complies with CSA-0188 and ANSI A208-1 standards.
 - .2 Stiles: 3 mm thick veneer, longitudinally laminated by hot pressing with type 1 structural glue, as per ASTM-D5456-93 (LVL FSC), including a 22 x 27 mm piece of hardwood, matched with faces.
 - .3 Top and bottom rails: 3 mm thick veneer, longitudinally laminated by hot pressing with type 1 structural glue, as per ASTM-D5456-93 (LVL FSC), or laminated strand lumber LSL for a total width of 85 mm.
 - .4 Faces: 3 mm white birch grade AA plywood veneer.
 - .5 Finish: Clear varnish, see **Section 09 91 00**.
 - .6 Total thickness: 45 mm.
- .2 **Type WD2 - Dutch doors 114, 118, 204 ,207, 209** - Particle core, ultra heavy-duty, anti-warping construction for intensive use: standard flush doors, 5 ply, same characteristics as **Type 1** with the two superposed sections working together or separately, with solid wood shelf.
 - .1 Solid wood shelf: white birch, depth and length as per drawings, thickness of 27mm, 15mm radius nosing, installed above lower door edge, protruding on push side, shelf sides chamfered/angled to allow door turning radius through door frame. Shelf supports fabricated of the same material as per shelf, dimensions coordinated with shelf. Varnish as per **Section 09 91 00**.
- .3 **Type WD3 - Sound retardant doors 115 and 120**, 30 mm structural composite lumber with 22 x 27 mm hardwood matched with faces, STC rating of 41dB, 5 ply, having the following characteristics.
 - .1 Core: Sound dampening core
 - .2 Stiles: 30 mm structural composite lumber with 22 mm hardwood matched with faces
 - .2 Top and bottom rails: 84 mm at top and bottom
 - .3 Faces: 3 mm white birch grade AA plywood veneer.
 - .4 Finish: Clear varnish see **Sections 09 91 00**.
 - .5 Total thickness: 45 mm.

-
- .3 **Type WD4 sliding door 105B (2 panels)** - Hollow core for moderate use, 5 ply, whit lock block low-density wood parts, 108 mm wide X 508 mm long, including stile, having the following characteristics.
- .1 Core: 120 mm honeycomb (100% recycled).
 - .2 Stiles: 30 mm low-density wood at top and bottom
 - .3 Top and bottom rails: 30 mm low-density wood at top and bottom
 - .4 Faces: 3 mm white birch grade AA plywood veneer.
 - .5 Finish: Clear varnish see **Sections 09 91 00**.
 - .6 Total thickness: 45 mm.
- 2.3 **Sliding door wood frame for doors 116, 119, 105A, 205, 208, 210** - Hardwood flat frame: 16 mm, white birch plywood with veneer.
- 2.4 **Accessories**
- .1 Glazing moldings: to profiles indicated, in hardwood, same material as door.
 - .2 Water resistant adhesive for wood: polyvinyl based, without urea formaldehyde (VOC <0.683 g/L).
 - .3 Glazing: as indicated in Door Schedule in plans – See **Section 08 80 50**.
 - .4 Hardware: see **Section 08 71 00**.
 - .5 Finishing: factory applied varnish, as per the prescriptions of **Section 09 91 00**.
 - .6 Wood veneers: 0.79 mm, white birch grade AA veneer, longitudinally laminated, varnish (see **Section 09 91 00**).
 - .7 Transfer door louvres: by Mechanical, natural aluminum finish AA-6063-T6, see mechanical drawings and specifications. See Architecture Drawings and Door Schedule for locations.
- 2.5 **Fabrication**
- .1 Check dimensions of openings and ensure that the floors are level under the doors before starting installation.
 - .2 Fabricate wood doors as AWI / AWMAC / WI requirements, Premium Grade, as prescribed in "Architectural Woodwork Standards".
 - .3 Bevel vertical edges of single acting wood doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.
 - .4 Prepare doors to receive glazing and seal edges of the openings.
 - .5 Reinforce door core with solid blocking for hardware requiring special solidity.
 - .6 Install louvres.
-

- .7 Fabricate doors as per CAN/ULC-S104 and CAN/ULC-S105 standards. Homologated doors and their metal frames must be labeled CSA Approved.
- .8 Doors shall resist warping, twisting, cracking, splitting of veneers, delaminating, discoloration, and all other defects in appearance or functioning of the door and frame assembly, due to changes in humidity, temperature or other factors.

3.0 EXECUTION

3.1 General

- .1 See also **Sections 08 11 00, 08 71 00, 08 80 50, and 09 91 00.**
- .2 Ensure that the works of all other finishing sections are complete before the installation of doors.

3.2 Installation of Wood Doors

- .1 Install doors, frames and hardware in accordance with AWI / AWMAC / WI requirements, Premium Grade, as prescribed in "Architectural Woodwork Standards", the manufacturer's written instructions and hardware templates.
- .2 Adjust operable parts for correct function.
- .3 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows, unless otherwise indicated:
 - .1 Sides, top and between leaves: 3.2 mm, \pm 1.6 mm.
 - .2 Door bottom: 19 mm, adjusted according to the threshold profile, if need be.
- .4 Keep doors open a few days after installation.
- .5 Apply varnish finish on wood doors as per **Section 09 91 00**, including on top and bottom of doors.
- .6 Seal around frames: see **Section 07 92 00**.

3.3 Installation of Fire Resistive Frames and Doors

- .1 Install labelled fire-rated metal frames and wood doors according to the National Fire Code and NFPA 80 requirements.

3.4 Installation of Glazing

- .1 Make sure that all finishes are fully dry before installing the glazing.
- .2 Dry install glazing with gasket, as indicated or required – See **Section 08 80 50**. Glazing in acoustical doors shall be factory installed by the manufacturer.

3.5 **Adjustment**

- .1 Re-adjust doors and hardware just prior to completion of work and after the final air balancing of the building, to function freely and properly.

3.6 **Cleaning**

- .1 Perform cleaning as per **Section 01 74 11**.

End of Section

1.0 GENERAL

1.1 References

- .1 Canadian General Standards Board (CGSB)
 - .1 CAN / CGSB-25.20- 95, Floor Primer.
- .2 Canadian Standards Association (CSA)
 - .1 CSA-A23.1-94, Concrete - Components and Execution of Work.

1.2 Performance Requirements

- .1 Submit written certification certifying that the different treatment products used are compatible and will not affect the properties of the flooring or the adhesives used to install them.

1.3 Action and Informational Submittals

- .1 Submit shop drawings in accordance with **Section 01 33 00** - Submittal Procedures.
- .2 Submit, for each type of door proposed, details from manufacturers' catalogs, illustrating the profiles and dimensions of the elements as well as the methods of assembly.

1.4 Closeout submittals

- .1 Provide instructions for cleaning and maintenance of finishes and incorporate into the manual prescribed in **Section 01 78 00** – Closeout submittals.

1.5 Delivery, storage and handling

- .1 Apply temporary protective coating to finished surfaces. Remove the coating once the structures have been put in place. Do not use coatings that may be difficult to remove or that may leave residue.
- .2 Do not remove the protective coating until the final cleaning of the building is completed.

1.6 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 Access doors for gypsum ceiling and wall partitions:

- .1 **Access door for ceiling and wall partition with 0 hour and 1 hour fire resistance:**
 - .1 Product: Fire rated insulated steel access door with drywall flange, 16 gauge cold rolled steel frame and 20 gauge galvaneal steel door, continuous piano hinge, handle operated slam latch, key operated cylinder cam latch, high quality powder coat primer.
 - .2 Finishing: refer to **Section 09 91 00 - Painting**.
 - .3 Color: such as adjacent surfaces; refer to the drawings.

-
- .2 **Access door for ceilings and wall partitions without fire resistance:**
 - .1 Product: Steel access door with drywall flange, 16 gauge cold rolled steel frame, continuous piano hinge, handle operated slam latch, key operated cylinder cam latch, high quality powder coat primer.
 - .2 Finishing: refer to **Section 09 91 00 - Painting**.
 - .3 Color: such as adjacent surfaces; refer to the drawings.
 - .3 Provide and coordinate with mechanical and electrical drawings all access doors required to access mechanical and electrical equipment. Plan for sufficient dimensions to allow adequate access to equipment.
 - .4 The Contractor shall submit reflective ceiling drawings indicating the correct sizes and locations of access doors for Departmental Representative's approval.
- 2.2 **Floor access hatch FAH1, with recess for receiving resilient flooring:**
- .1 Product: Recessed Aluminum floor hatch, aluminum door recessed for receiving resilient flooring, door designed to support a live load of 300 pounds/sq.foot, hold open arm to keep the door in an open position. 50 x 50 x 6 mm aluminum angle frame welded at corners, heavy duty aluminium continuous piano hinge 20 mm, 100 mm removable handle.
 - .2 Finishing: refer to Section **09 65 00 - Resilient Flooring**.
 - .3 Quantities and dimension: refer to the drawings.
- 2.3 **Floor access hatch FAH2, flush for concrete flooring:**
- .1 Product: Flush Aluminum floor hatch, aluminum door diamond plate 6 mm, door designed to support a live load of 300 pounds/sq.foot, hold open arm to keep the door in an open position. 50 x 50 x 6 mm aluminum angle frame welded at corners, heavy duty aluminium continuous piano hinge 20 mm, recessed handle operated hey cam latch.
 - .2 Finishing: aluminum diamond plate
 - .3 Quantities and dimension: refer to the drawings.
- 2.4 **Floor access hatch ladder for FAH1 and FAH2 : aluminum, designed to meet standards, with anti-slip bars.**
- .1 Size of the aluminum bars: 22mm x 19mm.
 - .2 Uprights: aluminum angles 50mm x 50mm x 6mm thick.
 - .3 Accessories:
 - .1 Heavy-duty, factory-installed safety extension consisting of a guided rail system formed of 38mm x 38mm x 6mm thick aluminum angle. With anchoring system and lifting handle.
 - .1 Extension poles: aluminum plates 50mm x 12.5mm thick.
-

- .2 Dimension of the aluminum bars: 22mm x 19mm.
- .2 Fastening: at the head and at the bottom of the ladder, in structural elements, as recommended by the manufacturer and in accordance with the safety codes in force.
- .3 Provide appropriate anchors.

3.0 EXECUTION

3.1 Installation

- .1 Install access doors and hatches according to manufacturer's written instructions.
- .2 Install ladders in accordance with manufacturer's written instructions and applicable safety codes.

3.2 Location

- .1 When hatches are indicated in the drawings, respect the locations described.
- .2 Where hatches must be coordinated with mechanical or electrical equipment, mount access doors at points in the network where equipment can be clearly seen and accessed for operation, inspection, adjustment and maintenance without the help of special tools.
- .3 Locate hatches to provide access to more than one equipment in the ceiling where possible, to minimize the number of access hatches.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 Aluminum Association (AA)
 - .1 AA DAF 45OL-03(R2009), Designation System for Aluminum Finishes.
- .3 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA CW-10, Care and Handling of Architectural Aluminum From Shop to Site .
 - .3 AAMA T1 R-A 1, Sound Control for Fenestration Products .
 - .4 AAMA 503-92, Voluntary Specification for Field Testing of Metal Storefronts, Curtain Wall and Sloped Glazing Systems.
 - .5 AAMA 609/610, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
 - .6 AAMA 611, Voluntary Specifications for Anodized Finishes Architectural Aluminum.
 - .7 AAMA 612, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.
 - .8 AAMA 1305-09, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections
 - .8 AAMA 2603, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - .9 AAMA 2604, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- .4 ASTM International
 - .1 ASTM A36/A36M, Specification for Carbon Structural Steel.
 - .2 ASTM A123/A123M, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip .
 - .4 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process .
 - .5 ASTM 8209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate .
 - .6 ASTM 8221, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .7 ASTM E283, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain's Walls, and Doors Under Specified Pressure Differences Across the Specimen.
 - .8 ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .9 ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference .
 - .10 ASTM E413, Classification for Rating Sound Insulation.
 - .11 ASTM E1105, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference .

-
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings
 - .6 CSA Group (CSA)
 - .1 AAMA/WDMA/CSA 101/I.S.2/A440-11(R2016), NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .2 CSA A440S1-[09], Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .3 CAN/CSA-A440.2-14/A440.3-[14], Fenestration energy performance/User guide to CSA A440.2, Fenestration energy performance.
 - .4 CAN/CSA-A440.4-07(R2016), Window, Door, and Skylight Installation
 - .5 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.
 - .6 CAN/CSA-Z809-08, Sustainable Forest Management.
 - .7 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual - current edition.
- 1.2 **Design Criteria for Glazing**
- .1 See Section 08 80 50.
- 1.3 **Performance Requirements**
- 1. **General Performance:** Aluminum-framed entrances system shall withstand the effects of the following performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
 - .2 **Structural performance:**
 - .1 The glazed aluminum work and doors shall withstand a positive or negative pressure of 1.33 kPa, and shall resist rupture under a maximum of 2.0 kPa force.
 - .2 Deflection of mullions shall be limited to L/175 of clear span, or a maximum of 19 mm for a height up to ± 3660 mm and 1/200 of the span, without exceeding 25 mm for heights between 3660 mm and 4880 mm, perpendicular to the panel, and to L/360 or a maximum of 3 mm parallel to the panel plane, as per CAN3-S157 and ASTM E330 when glazing is installed. Glazing shall fully recover its initial position.
 - .3 Size glass units and glass dimensions to limits established in CAN/CSGB-12.20.
 - .4 The glazed aluminum work shall accommodate allowable structural tolerances of the building and maintain their structural and visual integrity.
 - .5 Design metallic members to provide for thermal movement of component materials caused by ambient temperature range of 110°C (from -35°C to 75°C) over a period of 12 hours, without causing buckling, failure of joint seals, undue stresses on fasteners or other detrimental effects.
 - .6 Design joints to accommodate movement in glazed system and between system and building structure, caused by structural movements, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration - Coordinate with **Structure** plans and specifications.

-
- .7 Design and size anchorages, fasteners and components to withstand seismic loads and sway displacement as calculated in accordance with NBC.
 - .8 Ensure against vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of system.
 - .9 Provide vertical and horizontal reinforcing as required.
 - .10 Seismic resistance to be as per the requirements of the NBC (for claddings), and as per any other applicable code; coordinate with **Structure** plans and specifications.
- .3 **Installation tolerances:**
- .1 Maximum variation from plane or location shown on approved shop drawings: 3 mm in 3 m of length and up to 6 mm in 90 m.
 - .2 Maximum offset from true alignment between two adjacent members abutting end to end, in line: 0.80 mm.
- .4 **Air and water tightness:**
- .1 The design of the curtain wall shall be based on the "Rain Screen" principle.
 - .2 The system shall provide:
 - .1 Gaskets, baffles, overlaps and seals as required to provide a "Rain Screen" barrier to effectively deter rain water entry into the cavities of the system;
 - .2 A weep drainage network to drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior.
 - .3 The necessary "air seals" to minimize air passage from system cavities into building and vice versa, to assure adequate pressure equalization of system cavities with the outside;
 - .4 Continuous "air and vapour seals" required to minimize air borne vapour ex-filtration from the building into system cavities.
 - .5 Openings between these cavities and the outside, of sufficient cross-section to provide pressure equalization. All openings must be effectively baffled or otherwise guarded to minimize direct water entry.
- .5 **Thermal performances:**
- .1 See **above**.
- .6 **Resistance to condensation:**
- .1 Global resistance to condensation to meet design requirements for exterior temperatures from -40°C (± 1°C) and an interior temperature from 20°C (± 1°C) at relative humidity of 30% (± 5%): see **above**.
 - .2 No condensation shall form on any interior surfaces of the aluminum members before any of the exposed area of sealed units reaches the dew point temperature.
- 1.4 **Action and Informational Submittals**
- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 **Shop drawings:** Indicate thermal resistance, in/and ex-filtration as well as water resistance of the systems, as confirmed by the test reports.
-

-
- .2 **Technical data:** submit manufacturer's printed product literature, specifications and data sheets and include product characteristics, performance criteria, finish and limitations.
 - .3 **Test reports:**
 - .1 Conduct tests according to requirements and procedures of AAMA 501, CSA and ASTM standards mentioned in this Section.
 - .2 Submit substantiating engineering data, results of previous tests (conducted not earlier than three years) by an independent laboratory which purport to meet performance criteria, and other supportive data.
 - .4 **Product samples:** submit samples of each type of frame and door finish in the selected colour.
 - .5 **Operation and maintenance data:** submit instructions for maintenance of aluminum, as well as for dismantling of elements, and incorporate them into the Operation and Maintenance Manual, as per **Section 01 78 00**.

1.5 Handling

- .1 Purchase Requisitions: Comply with manufacturer's instructions for orders and lead time requirements to avoid construction delays.
- .2 Materials and materials must be transported, stored and handled in accordance with manufacturers' recommendations.
- .3 Ship materials in manufacturer's original, unopened, undamaged containers with identification tags intact.
- .4 Perform the work specified in this section in accordance with AAMA CW-10.
- .5 Store materials to protect them from the weather. Handle storefront materials and components to prevent damage. Protect storefront materials from damage that may be caused by components, construction and others that could damage them before, during and after the installation of storefronts. Protect the surfaces of pre-finished aluminum elements with protective packaging and peel-off film. Do not use adhesive papers or spray coatings that are very difficult to remove after exposure to the sun or the weather.

1.6 Additional Materials

- .1 Provide all types of extruded fillings (interior) that would be required when replacing any glass insulation board, in an amount equal to at least 1% of the required quantities.

1.7 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 All aluminum materials to be as per ASTM B221-08 and Aluminum Association standards.

2.2 Materials

- .1 Materials: in accordance with CAN / CSA-A440 and following requirements:
 - .1 All entrance door must be manufactured by the same manufacturer.
 - .2 Aluminum Extrusions: Alloy and temper recommended by aluminum storefront manufacturer for strength, corrosion resistance, and application of required finish and not less than 0.070" wall thickness at any location for the main frame and complying with ASTM B 221: 6063-T6 alloy and temper.
 - .3 Fasteners: Aluminum, nonmagnetic stainless steel or other materials to be non-corrosive and compatible with aluminum window members, trim hardware, anchors, and other components.
 - .4 Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 - .5 Reinforcing Members: Aluminum, nonmagnetic stainless steel, or nickel/chrome-plated steel complying with ASTM B 456 for Type SC 3 severe service conditions, or zinc-coated steel or iron complying with ASTM B 633 for SC 3 severe service conditions or other suitable zinc coating; provide sufficient strength to withstand design pressure indicated.
 - .6 Sealant: For sealants required within fabricated storefront system, provide permanently elastic, non-shrinking, and non-migrating type recommended by sealant manufacturer for joint size and movement.
 - .7 Tolerances: Reference to tolerances for wall thickness and other cross-sectional dimensions of storefront members are nominal and in compliance with AA Aluminum Standards and Data.
- .2 Aluminum frame and doors:
 - .1 **Aluminum thermal frames:** nominal size 51 x 114 mm, center glazed, with structural silicone sealant
 - .1 ASTM B221 compliant aluminum, tempered 6063-T6 alloy.
 - .2 Stainless steel fasteners when exposed.
 - .3 Extruded EPDM glazing trim.
 - .4 Aluminum perimeter anchorage.
 - .2 **Aluminum thermal doors:** heavy duty, insulated and glazed swing doors, engineered for thermal efficiency and added strength for institutions and increased traffic applications
 - .1 Wide and vertical stiles : 140 mm

- .2 Top rail : 140 mm
- .3 Bottom rail : 305 mm
- .4 Door : 57.2mm deep
- .5 Typical wall thickness : 3.2 mm
- .6 Dual welded corner construction
- .7 Polyamide thermal break

.3 Frames and doors will be designed to receive sealed units of double insulating glass, refer to Section **08 80 50 - Glazing**.

.4 Finish: Clear anodic coating natural

.5 For hardware, refer to Section **08 71 00**.

.6 Shape and dimensions : see **Architecture** drawings

.3 **Fasteners:**

- .1 In accordance with manufacturer's standards

2.3 Door Hardware

.1 All hardware for aluminum doors, including cylinders, shall be supplied by Section **08 71 00**, but installed by the door manufacturer, unless otherwise indicated. Electronic components, such as recessed magnetic contacts, electromagnets, electrified hinges and exit devices, etc. shall be supplied and installed by Section **08 71 00** and **Electrical**. Coordinate door preparation with them.

.2 Unless noted otherwise, all hardware shall be clear anodised finish.

.3 As much as possible, all hardware supplied by door manufacturer shall be installed at the factory before shipment.

.4 **Hardware items for aluminum thermal doors by door manufacturer:**

- .1 Weatherstripping: on three sides, adjustable.
- .2 Bottom stripping: adjustable, anodised aluminum profile and recessed watertight vinyl strip.
- .3 Thresholds : in aluminum, with thermal break, full width of door frame.
- .4 For all other items see Section **08 71 00**.

2.4 Accessories

1. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.
2. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
3. Sealants and joint fillers for joints at perimeter of frames see Section 07 92 00 - Joint Sealants
4. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and

aluminum material to prevent galvanic action

2.5 Fabrication – General

- .1 Form aluminum frames and doors as per AAMA/WDMA/CSA 101/I.S.2/A440, AAMA GSM-1.
- .2 Form extrusions and aluminum sheet into well defined, clean, straight profiles, free of all mould and lamination marks, scratches or other defects.
- .3 Deburr, smooth and round off raw edges of plates and sheet material prior to forming during fabrication.
- .4 Face dimensions detailed maximum permissible sizes.
- .5 Fabricate aluminum work square and true with maximum tolerances of 1.6 mm for units with diagonal measurement of 1800 mm or less, and 3.2 mm for units with diagonal measurement greater than 1800 mm.

2.6 Fabrication of Doors and Frames

- .1 Fabricate doors and frames according to profiles and sizes as shown. Provide minimum 12.7 mm bite for sealed glazed units.
- .2 Provide structural steel reinforcement as required for doors and frames.
- .3 All joints shall be adjusted, tight, waterproof and secured mechanically with concealed fasteners.
- .4 Coordinate with suppliers of finish hardware (See **Section 08 71 00**) to obtain templates and related information to mortise, reinforce, drill and tap doors and frames to receive hardware installed by this Section.
- .5 Recessed and mortised openings required for installing finish hardware shall be cut with care. Reinforcing plates in aluminum or galvanized steel shall be placed at required locations.
- .6 Exterior doors shall be provided with a removable weather-stripping. The door bottom shall have a seal in which the smooth part is installed in the bottom guide.

2.7 Protective coating: bituminous paint resistant to alkalis.

- .1 Insulate aluminum elements with a protective coating.
 - .1 Elements of different metals, except small elements of stainless steel, zinc or tin bronze;
 - .2 Concrete, mortar and masonry elements;
 - .3 Wood elements.

2.8 Handling and storage

- .1 Materials will be stored in locations providing the best protection possible.
- .2 Materials must be delivered in their original containers; labels and seals will be intact until use.

3.0 EXECUTION

3.1 Examination

- .1 Verify dimensions, tolerances, and method of attachment to other work.
- .2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 Installation

- .1 Install aluminum frames and doors as per AAMA GSM-1 and AAMA CW-1-9 and AAMA/WDMA/CSA 101/I.S.2/A440, and as per manufacturer's recommendations.
- .2 Make allowances for deflection of structure to ensure that structural loads are not transmitted to frames.
- .3 Ensure the integrity of the rain screen system throughout the aluminum work.
- .4 Allow space around frames for caulking, dimensions as per **Architecture** drawings. Install shims on sills and jambs and frames square and plumb.
- .5 Install anchors properly to receive aluminum work. Provide anchors and plates, etc. for other trades if required to be embedded in their work. Coordinate with **Structure**.
- .6 Install aluminum work plumb, square, level, and as indicated on drawings. Installation shall be free from warp, twist and superimposed loads. Maintain assembly dimensional tolerances.
- .7 Make sure exposed raw edges of plates and sheet material are deburred, smoothed and rounded off prior to installation.
- .8 Provide thermal insulation where components penetrate or disrupt building insulation.
- .9 Secure work solidly in required position, attaching to the support elements, in a manner to permit sufficient adjustment, to accommodate construction tolerances and other irregularities as well as thermal movements.
- .10 Provide adjustable attachments and shims to permanently fasten system to building structure. Clean welded surfaces; apply protective primer to field welds and adjacent surfaces.
- .11 Eliminate risk of electrolysis and isolate aluminum from direct contact with another metal or mortar with a protective layer applied on site.
- .12 Cut straight and level with framing member the wet seals of glazing.
- .13 Ensure compatibility of sealants used with the silicone glazing system and the perimeter seals of double sealed glazed units, if applicable.

-
- .14 Use thermal break between exterior aluminum cladding and steel supports.
 - .15 Give exterior sills or flashings at least a 1:10 slope.
 - .16 Install backer rods, where necessary, and seal joints between frame and adjacent surfaces with a sealing compound, as specified in Section 07 92 00 - **Joints Sealing** and **Architecture** drawings, to ensure exterior weathertightness and interior air/vapour tightness.
 - .17 Fill spaces at perimeter of assembly with insulation as per Section - 07 20 00 and **Architecture** drawings to maintain continuity of thermal barrier.
 - .18 Coordinate installation of flashings and copings with Section 07 40 00.
 - .19 Install with care finish hardware not already installed in shop. Install also items specified in Section 08 71 00.
 - .20 Adjust doors once the balancing of the ventilation system is complete.
 - .21 As the aluminum doors are part of the security system, coordination between electrician and aluminum door manufacturer is essential. Card readers, magnetic locks and release, relays and wiring installation shall be executed by security systems contractor at aluminum door manufacturer's shop during fabrication and assembly of door, as indicated in Section 08 71 00. Connections to electric circuits shall be effected by **Electrical** after door installation on site.

3.4 Installation of Glazing for Doors and Frames

- .1 Install glazing of doors in shop as per manufacturer recommendation.
- .2 Install sealed double glazing for doors and frames by the dry method for the interior and for the exterior.
- .2 See Section 08 80 50 for generalities regarding glazing installation.

3.5 Cleaning and Protection

- .1 Perform cleaning as per Section 01 74 11.
- .2 As the work progresses as well as at the end of installation, all foreign substances shall be removed from the work and it shall be cleaned of all stains, paint marks, dirt and mastic smudges, drops of sealant, etc. which may be difficult or impossible to remove later.
- .3 Replace damaged panels or accessories, which cannot be repaired in satisfactory and adequate manner by touch-ups or other minor means of repair.
- .4 Remove protective material from prefinished aluminum surfaces according to the progress of work.
- .5 Remove labels after work is completed and clean glazing and aluminum surfaces with agents recommended by the manufacturers. Eliminate dust. Wipe surfaces clean.

- .6 Provide protection as necessary to protect completed work until end of construction work.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 Aluminum Association (AA)
 - .1 AA DAF 45OL-03(R2009), Designation System for Aluminum Finishes.
- .3 American Architectural Manufacturers Association (AAMA)
 - .1 AAMA CW-10, Care and Handling of Architectural Aluminum From Shop to Site.
 - .2 AAMA CW-11, Design Wind Loads and Boundary Layer Wind Tunnel Testing.
 - .3 AAMA T1 R-A 1, Sound Control for Fenestration Products.
 - .4 AAMA 501, Methods of Test for Exterior Walls.
 - .5 AAMA 609/610, Cleaning and Maintenance Guide for Architecturally Finished Aluminum.
 - .6 AAMA 611, Voluntary Specifications for Anodized Finishes Architectural Aluminum.
 - .7 AAMA 612, Voluntary Specifications, Performance Requirements, and Test Procedures for Combined Coatings of Anode Oxide and Transparent Organic Coatings on Architectural Aluminum.
 - .8 AAMA 2603, Voluntary Specification Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
 - .9 AAMA 2604, Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
- .4 ASTM International
 - .1 ASTM A36/A36M, Specification for Carbon Structural Steel.
 - .2 ASTM A123/A123M, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - .3 ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
 - .4 ASTM A653/A653M, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .5 ASTM 8209, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - .6 ASTM 8221, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - .8 ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 - .9 ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference .
 - .10 ASTM E413, Classification for Rating Sound Insulation.
 - .11 ASTM E1105, Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference.
- .5 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings

- .6 CSA Group (CSA)
 - .1 AAMA/WDMA/CSA 101/I.S.2/A440-11(R2016), NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .2 CSA A440S1-[09], Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard for Windows, Doors, and Skylights.
 - .3 CAN/CSA-A440.2-14/A440.3-14, Fenestration energy performance/User guide to CSA A440.2, Fenestration energy performance.
 - .4 CAN/CSA-A440.4-07(R2016), Window, Door, and Skylight Installation
 - .5 CAN/CSA-Z91-02(R2013), Health and Safety Code for Suspended Equipment Operations.
 - .6 CAN/CSA-Z809-08, Sustainable Forest Management.
- .7 Master Painters Institute (MPI)
 - .1 Architectural Painting Specification Manual.
- .8 Screen Manufacturers Association (SMA)
 - .1 SMA 1201R-2012 Specification for Insect Screens for Windows, Sliding Doors and Swinging Doors.

1.2 Design Criteria for Glazing

- .1 See **Section 08 80 50**.

1.3 Performance Requirements

- .1 General Performance: Aluminum-framed window system shall withstand the effects of the following performance requirements without failure due to defective manufacture, fabrication, installation, or other defects in construction.
- .2 Window System Performance Requirements:
 - .1 Provide windows capable of meeting specified performance requirements and complying with AAMA / WDMA / CSA 101 / I.S.2 / A440-08 (NAFS-08).
- .3 Product Classification:
 - .1 Main designation:
 - .1 Class and Category of Performance: CW-PG50
 - .2 Product type: Type AP and FW.
 - .2 Secondary designation:
 - .1 Positive computational pressures: 2400 Pa
 - .2 Negative design pressure: -2400Pa
 - .3 Water infiltration test pressure: 400 Pa
 - .4 Level of infiltration / exfiltration of air: A3 and fixed
- .4 Air Infiltration: The test specimen shall be tested in accordance with ASTM E283.
- .5 Water Resistance: The test specimen shall be tested in accordance with ASTM E547 and ASTM E331.
- .6 Uniform Load Deflection: A minimum static air pressure difference of 75 psf (3592 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. There shall be no

deflection in excess of $L/175$ of the span of any framing member.

- .7 Uniform Load Structural: A minimum static air pressure difference of 60 psf (2874 Pa) shall be applied in the positive and negative direction in accordance with ASTM E330. The unit shall be evaluated after each load.
- .8 Component Testing: Window components shall be tested in accordance with procedures described in AAMA/WDMA/CSA 101/I.S.2/A440-05
- .9 Thermal Transmittance (U-factor): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall not be more than $2.43\text{W}/(\text{m}^2.\text{k})$.
- .10 Condensation Resistance (CRF): When tested to AAMA Specification 1503, the condensation resistance factor shall not be less than 73 frame and 74 glass, or Condensation Index (I): when tested to CSA-A440-00, the Condensation Index shall not be less than 64 frame and 66 glass.
- .11 Forced Entry Resistance: All windows shall conform to ASTM F588, Grade 10

1.4 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 **Shop drawings:** The shop drawings must clearly indicate the nature of the materials, contain full-size details of the lintel, studs and spandrel, component parts profiles, interior and exterior trim, junctions between elements combined, elevations of the structure and details of the anchors, show the location of the protective coating, and describe the related components, caulking and exposed finishes and fasteners. Indicate the location of the manufacturer's nameplate.
 - .2 **Technical data:** submit manufacturer's printed product literature, specifications and data sheets and include product characteristics, performance criteria, finish and limitations. Indicate thermal resistance, in/and ex-filtration as well as water resistance of the systems, as confirmed by the test reports.
 - .3 **Test reports:**
 - .1 Conduct tests according to requirements and procedures of AAMA 501, CSA and ASTM standards mentioned in this Section.
 - .2 Submit substantiating engineering data, results of previous tests (conducted not earlier than three years) by an independent laboratory which purport to meet performance criteria, and other supportive data.
 - .4 **Product samples:** submit samples of each type of window frame finish in the selected colour.
 - .5 **Operation and maintenance data:** submit instructions for maintenance of aluminum, as well as for dismantling of elements, and incorporate them into the Operation and Maintenance Manual, as per **Section 01 78 00**.

1.5 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 All aluminum materials to be as per ASTM B221-08 and Aluminum Association standards.

2.2 Materials

- .1 Materials: in accordance with CAN / CSA-A440 and following requirements:
 - .1 All windows must be manufactured by the same manufacturer.
 - .2 Aluminum: extruded aluminum profiles, alloy AA 6063-T6 Aluminum Association, enamelled treated by thermo-hardening process.
 - .3 Interior and exterior aluminum supports and trim: extruded aluminum of specified size and type, including joint covers, splines, chairs, anchors. The supports will be extruded aluminum; folded sections will not be accepted.
 - .4 The internal and external aluminum members shall be joined together by a thermal barrier in accordance with the standards in force.
 - .5 Outside window sill (threshold): inclination of 8 °.
 - .6 Insect screen: fixed, same size as opening frame, in accordance with CAN / CGSB-79.1-M91.
 - .1 0.279 mm aluminum sheeting with 18 x 16 mesh per square inch.
 - .2 Frame: aluminum profile
 - .1 Attached to the window frame with screws piercing the window fin from the inside, in addition to the regular mosquito net attachment system. These mosquito nets will always be removable from the inside of the building.
 - .2 aluminum rod and retaining strip.
 - .3 frame finish: such as window.
 - .7 Weather-stripping: double intensity.
 - .8 Protective coating: bituminous paint resistant to alkalis.
 - .9 Glazing Panels: Refer to **Section 08 80 50 - Glazing**.
 - .10 Fasteners: Screws, bolts, fasteners of any kind for fastening hardware parts of frames and shutters will be zinc plated steel.

- .11 Finish - Interior and exterior: Anodic treatment obtained by acid etching, followed by anodic oxide treatment in accordance with the standard AA-M10C21A31 of 10 micros thick natural color no.17.

.2 Fixed and Openable Windows:

- .1 High performing and robust aluminium windows with high thermal resistance, anodized extruded sections, fixed and openable towards the interior (open-in vent / BPI) casements as per indicated on drawings, with multiple thermal breaks.
 - .1 Dimensions: see Architecture drawings; frame depth: 127 mm.
 - .2 Finish: clear anodized natural aluminium no.17, conform to AA-M10C22A31, Architectural category II, minimum 0.4mil.
 - .3 Hardware :
 - .1 Provide manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum; designed to smoothly operate, tightly close, and securely lock aluminum windows, and sized to accommodate sash weight and dimensions.
 - .2 Single Heavy duty handle with multi-point locks, clear anodized natural aluminium
 - .3 Cast White Bronze Cam Locks, clear anodized natural aluminium
 - .4 Access Control Locks
 - .5 Heavy duty 4-bars hinges, limit stop at 45 degrees
 - .6 The hardware will be screwed into 2.4 mm thick aluminum walls.
 - .2 **Fasteners:** In accordance with manufacturer's standards
 - .3 **Glazing:** Windows will be designed to receive sealed units of double insulating glass. See **Section 08 80 50**.

2.3 Accessories

- 1. Spacers, Setting Blocks, Gaskets, and Bond Breakers: Manufacturer's standard permanent, non-migrating types in hardness recommended by manufacturer, compatible with sealants, and suitable for system performance requirements.
- 2. Framing system gaskets, sealants, and joint fillers as recommended by manufacturer for joint type.
- 3. Sealants and joint fillers for joints at perimeter of window see **Section 07 92 00 - Joint Sealants**.
- 4. Perimeter Anchors: When steel anchors are used, provide insulation between steel material and aluminum material to prevent galvanic action.

2.4 Fabrication – General

-
- .1 Fabricate windows as per AAMA/WDMA/CSA 101/I.S.2/A440, AAMA GSM-1 and to the following requirements.
 - .2 Form extrusions and aluminum sheet into well defined, clean, straight profiles, free of all mould and lamination marks, scratches or other defects.
 - .3 Deburr, smooth and round off raw edges of plates and sheet material prior to forming during fabrication.
 - .4 Face dimensions detailed maximum permissible sizes.
 - .5 Fabricate aluminum work square and true with maximum tolerances of 1.6 mm for units with diagonal measurement of 1800 mm or less, and 3.2 mm for units with diagonal measurement greater than 1800 mm.

2.5 Fabrication - Openable casement windows

- .1 Window frames shall be constructed of two tubular, double wall, aluminium interior and exterior sections, integrated with 2 glass reinforced nylon thermal breaks to form a rigid composite assembly and crimp.
- .2 Frame joints assembly shall be done with corrosion resistant screws through the walls and in the extruded grooves which are part of the butted sections.
- .3 Frame joints shall be fabricated precisely, assembled and sealed to be air/watertight, with clean lines.
- .4 Double sealed glazing units shall be held in place with removable interlocking glass beads.
- .5 All glazing pockets shall be vented, pressure equalized and drained to the exterior. The air seal performance will be achieved with an EPDM gasket with a lock-in screwless type glass stop and an extruded black, closed cell elastomeric element of appropriate durometer hardness for this function.

2.6 Protective coating: bituminous paint resistant to alkalis.

- .1 Insulate aluminum elements with a protective coating.
 - .1 Elements of different metals, except small elements of stainless steel, zinc or tin bronze;
 - .2 Concrete, mortar and masonry elements;
 - .3 Wood elements.

3.0 EXECUTION

3.1 Examination

- .1 Verify dimensions, tolerances, and method of attachment to other work.
- .2 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this section.

3.2 Handling and storage

- .1 Materials will be stored in locations providing the best protection possible.
- .2 Materials must be delivered in their original containers; labels and seals will be intact until use.

3.3 Installation of windows

- .1 Install windows in accordance with CAN / CSA-A440.4-F07 (C2012).
- .2 The color must be uniform between the different windows.
- .3 Install and seal membranes at perimeter of openings as per drawings.
- .4 Provide nailing bottoms with spacing for caulking and sealing, dimensions as per drawings.
- .5 Lay shims under jambs and sills and set windows level and plumb. Before installing the glazing panels, appropriate seating blocks will be located according to the manufacturer's recommendations and put in place.
- .6 All shutters will be adjusted and their operation checked.
- .7 Windows must be installed, glazed and adjusted by experienced workers, according to the manufacturer's instructions and in accordance with approved shop drawings.
- .8 Fasten window frames with new stainless steel or zinc plated steel screws.
- .9 Aluminum surfaces that come into contact with concrete, mortar, plaster or other metals will be coated with bituminous paint.
- .10 The space between the window and the frame shall be filled with polyurethane spray. A backer rod will serve as a support for sealants application. Refer to **Section 07 92 00 - Joint Sealants** and to **Architecture** drawings.
- .12 The necessary clearance for thermal movement of window components shall be incorporated in suitable and discreet locations and such play shall not be detrimental to the strength, rigidity, watertightness and good appearance of the installation.
- .13 The windows will be installed according to the strict recommendations of the manufacturer.

3.4 Installation of exterior flashings

- .1 See Section 07 40 00 - Claddings

3.5 Sealing and caulking

- .1 Apply sealant in accordance with **Section 07 92 00 - Joint Sealants**. Conceal the sealant inside the window, except where the Monitor allows it to be visible.

- .2 The joints between the aluminum frames and the cladding, between the dormers and spandrels, as well as the butt joints of the spandrels, will be caulked with a sealant to ensure weather tightness. Refer to **Section 07 92 00 - Joint Sealants**.
- .3 Seal joints between windows and window sills with sealant. The rebates and joint covers for expansion joints of the supports must be embedded in a caulking compound. Caulk the joint between the rising part of the support and the frame of the window. Caulk abutting joints of continuous supports.
- .4 Caulk joints between frame members and other dormant parts with sealant to provide weathertight weathering to exterior as well as airtightness and vapor tightness to interior.

3.6 Cleaning and Protection

- .1 Perform cleaning as per **Section 01 74 11**.
- .2 As the work progresses as well as at the end of installation, all foreign substances shall be removed from the work and it shall be cleaned of all stains, paint marks, dirt and mastic smudges, drops of sealant, etc. which may be difficult or impossible to remove later.
- .3 Replace damaged panels or accessories, which cannot be repaired in satisfactory and adequate manner by touch-ups or other minor means of repair.
- .4 Remove protective material from prefinished aluminium surfaces according to the progress of work.
- .5 Remove labels after work is completed and clean glazing and aluminum surfaces with agents recommended by the manufacturers. Eliminate dust. Wipe surfaces clean.
- .6 Provide protection as necessary to protect completed work until end of construction work.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 American National Standards Institute (ANSI)
 - .1 ANSI/BHMA A156.1-2013, Butts and Hinges
 - .2 ANSI/BHMA A156.2-2011, Bored and Preassembled Locks and Latches
 - .3 ANSI/BHMA A156.3-2008, Exit Devices
 - .4 ANSI/BHMA A156.4-2013, Doors Controls-Closers
 - .5 ANSI/BHMA A156.5-2010, Cylinders and Input Devices for Locks
 - .6 ANSI/BHMA A156.6-2010, Architectural Door Trim
 - .7 ANSI/BHMA A156.8-2010, Doors Controls-Overhead Stops and Holders
 - .8 ANSI/BHMA A156.10-2011, Power Operated Pedestrian Doors
 - .9 ANSI/BHMA A156.13-2012, Mortise Locks
 - .10 ANSI/BHMA A156.14-2013, Sliding and Folding Hardware
 - .11 ANSI/BHMA A156.15-2011, Release Devices
 - .12 ANSI/BHMA A156.16-2013, Auxiliary Hardware
 - .13 ANSI/BHMA A156.17-2010, Self Closing Hinges
 - .14 ANSI/BHMA A156.18-2012, Materials and Finishes
 - .15 ANSI/BHMA A156.19-2013, Power Assist & Low Energy Power Operated Doors
 - .16 ANSI/BHMA A156.21-2009, Thresholds
 - .17 ANSI/BHMA A156.22-2012, Door Gasketing and Edge Seal Systems
 - .18 ANSI/BHMA A156.23-2010, Electromagnetic Locks
 - .19 ANSI/BHMA A156.24-2012, Delayed Egress Locks
 - .20 ANSI/BHMA A156.26-2012, Continuous Hinges
 - .21 ANSI/BHMA A156.31-2013, Electric Strikes and Frame Mounted Actuators
 - .22 ANSI/BHMA A156.36-2010, Auxiliary Locks
- .3 UL-Underwriters' Laboratories/ULC-Underwriters' Laboratories of Canada (UL/ULC)
 - .1 CAN/ULC-S533-08- EN, Standard for Egress Door Securing and Releasing Devices
- .4 Canadian Standards Association (CSA)
 - .1 CSA B651-12 - Accessible Design for the Built Environment.

1.2 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
 - .1 **Shop drawings:**
 - .1 Submit complete list of hardware items, identified by types as indicated herein.
 - .2 Submit also complete hardware schedule listing each door, including hardware group numbers.
 - .3 Indicate proposed hardware, including make, model, material, function, finish, installation height and position, wiring diagrams (if applicable), other relevant information.
 - .4 Submit list of keys for approval.

- .2 **Technical data sheets:** supply templates to the door and frame manufacturers in time to allow for preparation of doors and frames.
- .3 **Operating and maintenance data:** provide a 4-hour training session to the maintenance staff of the Departmental Representative; session shall include the operating procedures, the cleaning of the hardware and how to perform preventative maintenance. Refer to **Section 01 79 00**.
- .4 **Extra materials, special tools and spare parts:** supply two sets of special tools for specified hardware, as applicable.

1.3 Delivery and Storage

- .1 Package each item of hardware including fasteners, separately, according to hardware group, and label each package door by door.
- .2 Store finish hardware in locked, clean and dry area.
- .3 Maintain inventory list with hardware schedule.
- .4 Deliver keys directly to Departmental Representative, in properly identified envelopes.

1.4 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 Coordination

- .1 Closely coordinate with related Sections before supplying hardware.
- .2 Check air pressure differentials to ensure door closers are properly adjusted, and have the required force to operate properly.

2.2 Hardware Finish Legend

626	Satin chromium (brass or bronze)
627	Aluminum, natural (not anodized)
628	Aluminum anodized
629	Bright stainless steel
630	Satin stainless steel
646	Satin nickel plated
652	Satin chromium plated (steel)
689	Aluminum painted (steel, plastic)
693	Black painted (steel, plastic)
719	Aluminum, mill finish (uncoated)
BLACK	Black
P	Primed for paint
SSL	Stainless steel look
WHITE	White

2.3 Abbreviations for Hardware Items

AC	Actuator
AP	Armor plate (protection plate)
AS	Astragal
BU	Bumper (floor/wall)
CA	Carry bar
CB	Chain bolt
CR	Card reader
CN	Chain
CO	Coordinator
CM	Cremone
CT	Contact
CY	Cylinder
DB	Door bottom
DC	Door closer
DD	Dead lock
DE	Door edge
DH	Door holder / overhead stop
DL	Double point lock
DP	Door pull
DS	Door stop/holder (floor/wall)
DU	Dust proof strike
EB	Electrical supply box
EC	Electronic/pneumatic door closer
ED	Exit device
EH	Electro-magnetic door holder
EL	Electronic locking device
EM	Electro-magnet (locking device)
ES	Electric strike
EG	Emergency station, manual
FB	Flush bolt
FC	Floor closer
GU	Guide and channel for folding or sliding doors
HD	Dutch door bolt
HB	Hookbolt
HG	Hinge
HS	Hookbolt strike
KY	Keypad
KP	Kick plate
LA	Latch
AL	Local alarm
LD	Locking or latching device
MB	Mounting bracket
MC	Magnetic catch
MP	Mop plate
MT	Magnetic contact
OP	Operator
OR	Overhead roller (hanger)
PB	Push (and pull) bar
PD	Presence detector
PI	Pivot set
PP	Push Plate
PU	Push button

RE	Relay
RM	Removable mullion
SA	Saddle (threshold)
SB	Surface bolt
SN	Warning sign
SP	Special hardware
SS	Soundstripping
ST	Strike
SW	Switch
TK	Track for folding or sliding doors
TL	Three point lock
TM	Trim
TR	Transformer
WD	Wring diagram
WS	Weather-stripping

2.4 Hardware Items

- .1 Unless otherwise indicated, only hardware items that meet ANSI/BHMA A156 (series) standards are acceptable for use for this project.
- .2 Use ULC listed hardware for fire doors and exit doors.
- .3 All hardware and its installation shall conform to CSA B651-12.
- .4 Electrified hardware shall be as per CAN/ULC-S533, and will carry a ULC or WHI Fire label.
- .5 Use only one manufacturer's products for all similar items unless otherwise indicated.
- .6 All hardware items to include all accessories such as mounting plates, shims, screws, bolts, drop plates, etc. required for installation and operation of hardware.
- .7 Spring Hinges, as per ANSI/BHMA A156.17

LEG.	DESCRIPTION	FIN.
HG1	K81071F spring hinge	652

- .8 Continuous Hinges as per ANSI/BHMA A156.26

LEG.	DESCRIPTION	FIN.
HG2	A51021B stainless steel continuous hinge barrel type edge mount	630
HG3	A31021G heavy duty aluminum continuous hinge geared type edge mount	628
HG4	A51321B stainless steel continuous hinge edge mount with wire transfer, 4 wires minimum, wire size 0.460 mm (26 gauge) minimum	630
HG12	A31021G heavy duty aluminum continuous hinge geared type edge mount	628

	with wire transfer, 4 wires minimum, wire size 0.460 mm (26 gauge) minimum	
--	--	--

.9 Hinges as per ANSI/BHMA A156.1

LEG.	DESCRIPTION	FIN.
HG5	A8111 NRP electrified full mortise heavy duty hinge, non-removable pin, minimum of 4 wires, wire size 0.411 mm (28 gauge)	652
HG6	A8112 NRP electrified full mortise hinge, non-removable pin, standard duty minimum of 4 wires, wire size 0.411 mm (28 gauge)	652
HG7	A8111 NRP full mortise heavy duty hinge, non-removable pin	652
HG8	A8112 NRP full mortise hinge, non-removable pin, standard duty	652
HG9	A5111 NRP full mortise heavy duty hinge, non-removable pin	630
HG10	Adjustable concealed hinge with steel frame adaptor, 3 way adjustments, load capacity 120 kg, opening angle up to 180 degrees, side and height adjustments of +/- 3mm, compression +/- 1mm	652
HG10.1	Adjustable concealed offset hinge with steel frame adaptor, 3 way adjustments, load capacity 100 kg, opening angle up to 180 degrees, side and height adjustments of +/- 3mm, compression +/- 1mm, to be installed with a 14mm recessed frame facing.	652
HG11	Concealed power transfer	630

.10 Pivots as per ANSI/BHMA A156.4

LEG.	DESCRIPTION	FIN.
HG11	Pivot for pocket doors C07601	630

.11 Flush bolts, as per ANSI/BHMA A156.16

LEG.	DESCRIPTION	FIN.
FB1	Recessed manual flush bolt L04081 x dimension as indicated in the hardware schedule	626

.12 Surface bolts as per ANSI/BHMA A156.16

LEG.	DESCRIPTION	FIN.
SB1	Surface bolt 152 mm lock in the shelf of the Dutch door L04512	626
SB2	Surface bolt 152 mm L0452	626

.13 Flush bolts as per ANSI/BHMA A156.3

LEG.	DESCRIPTION	FIN.
FB2	self-latching extension flush bolt set Type 27	626
FB3	Automatic latching flush bolt set Type 23	626

.14 Cylinders locks and latches Series 1000, as per ANSI/BHMA A156.2

LEG.	DESCRIPTION	FIN.
LD1	Heavy-duty office function cylindrical lock F04	626
LD2	Heavy-duty classroom function cylindrical lock F05	626
LD3	Heavy-duty intruder function cylindrical lock, double cylinder F32	626
LD4	Heavy-duty storeroom function cylindrical lock F07	626
LD5	Heavy-duty storeroom function cylindrical lock less outside lever F07	626
LD6	Heavy-duty privacy function cylindrical lock F22	626
LD7	Heavy duty passage function cylindrical lock F01	626

.15 Exit devices and accessories as per ANSI/BHMA A156.3

LEG.	DESCRIPTION	FIN.
ED1	Heavy duty Rim type exit device night latch function with lever trim Type 1-03 Push-pad with back finished same as the front	630
ED2	Heavy duty rim type exit device classroom function with double cylinder and lever trim Type 1-10 Push-pad with back finished same as the front	630
ED3	Heavy duty rim type exit device exit only function Type 1-01 Push-pad with back finished same as the front	630
ED4	Heavy duty mortise type exit device with latch monitoring switch and push bar switch with lever trim passage function Type 3-14 Push-pad with back finished same as the front	630
ED5	Heavy duty recessed vertical rod exit device for hollow metal door passage function with lever trim Type 8-14 Push-pad with back finished same as the front	630
ED6	Heavy duty recessed vertical rod exit device for narrow stile door passage function with lever trim, less bottom rod. Type 6-14 Push-pad with back finished same as the front	630
ED7	Heavy duty surface vertical rod/rim three point latch exit device classroom function with double cylinder and lever trim. Type 9-10 Push-pad with back finished same as the front	630

ED8	Heavy duty surface vertical rod/rim three point latch exit device night latch function Type 9-03 Push-pad with back finished same as the front	630
ED9	Heavy duty surface vertical rod/rim three point latch exit device night latch function with fail secure controlled lever trim Type 9-03 Push-pad with back finished same as the front	630
ED10	Heavy duty surface vertical rod/rim three point latch exit device night latch function with electric latch retraction, lever trim and request for exit switch and power supply Type 9-03 Push-pad with back finished same as the front	630
ED11	Heavy duty Rim type exit device for fire rated door Classroom function with lever trim Type 1-03 Push-pad with back finished same as the front	630
ED12	Heavy duty Rim type exit device for fire rated door passage function with lever trim Type 1-03 Push-pad with back finished same as the front	630
CO1	Door coordinator installed on door stop Type 21A	Black

.16 Latches as per ANSI/BHMA A156.36

LEG.	DESCRIPTION	FIN.
LA1	Latch bolt lock for aluminum door with thumb-turn E0231	628

.17 Deadbolts as per ANSI/BHMA A156.36

LEG.	DESCRIPTION	FIN.
DD1	Heavy duty mortise deadbolt classroom function E06091	630

.18 Cylinders as per ANSI/BHMA A156.5

LEG.	DESCRIPTION	FIN.
CY1	Mortise type cylinder with interchangeable core E19241 x E19251	626
CY2	Rim type cylinder with interchangeable core E19241 x E19261	626
CY3	Mortise type cylinder with thumb-turn, no key	626
CY4	Key in lever type E19241 x E19251	626

.19 Door pulls as per ANSI/BHMA A156.6

LEG.	DESCRIPTION	FIN.
DP1	Stainless steel door pull 1828 mm x 38 mm diam. with 2 posts, back to back mounting J401BTB	630
DP2	Stainless steel door pull "U" shape 381 mm cc x 32 mm diam. J401	630
DP3	Recessed flush pull 96 mm x 87 mm J403	630
DP4	Recessed flush pull 48 mm x 60 mm J403	630
DP5	Recessed edge pull D2801	630
DP6	Rectangular flush pull	626
DP7	Conceal door pull	626

.20 Track and miscellaneous hardware as per ANSI/BHMA A156.14

LEG.	DESCRIPTION	FIN.
TK1	Pocket door frame with sliding door hardware, track, hangers ,stops, guides	628
SP1	Cane bolt D8441 x 610 mm	600
SP2	Top spring bolt x proper chain length D6531 x D8532	600
SP3	Floor door guide	628
SP4	Guide channel	628
SP5	In track door stop	628
SD1	Sliding double door with complete hardware	628
SD2	Sliding double door Fascia and end cap	628

.21 Push plates, as per ANSI/BHMA A156.6

LEG.	DESCRIPTION	FIN.
PP1	Push plate x double sided tape J302	630

.22 Astragals: as per ANSI/BHMA A156.22

LEG.	DESCRIPTION	FIN.
AS1	Surface astragal with weather-strip R0Y634	628
AS2	Surface meeting stile astragal R0Y734	628

.23 Door closers, as per ANSI/BHMA A156.4

LEG.	DESCRIPTION	FIN.
DC1	Heavy-duty adjustable door closer with parallel heavy duty rigid arm C02021	689
DC2	Heavy-duty and adjustable door closer with parallel heavy duty rigid arm and cushion stopper on arm C02021	689
DC3	Heavy-duty adjustable door closer regular arm hold-open C02051	689
DC4	Heavy-duty adjustable door closer parallel heavy duty rigid arm and cushion stopper on arm hold-open C02021	689
DC5	Heavy-duty adjustable door closer parallel heavy duty rigid arm hold open C02021	689
DC6	Heavy-duty adjustable door closer parallel arm C02021	689
DC7	Heavy-duty adjustable door closer parallel hold-open C02021	689
DC8	Heavy-duty adjustable door closer regular arm and delayed action C020211	689
DC9	Heavy-duty adjustable door closer with track arm C020211	689
DC10	Heavy-duty adjustable door closer with track arm with hold open C020211	689

.24 Kick plates, as per ANSI/BHMA A156.6

LEG.	DESCRIPTION	FIN.
KP1	Stainless steel kick-plate 1.27 mm thick dimensions as per hardware schedule J102	630

.25 Overhead door stops, as per ANSI/BHMA A156.8

LEG.	DESCRIPTION	FIN.
DH1	Standard duty surface overhead door stop C05541	630
DH2	Heavy duty concealed overhead door stop C01541	630
DH3	Heavy duty surface overhead door stop C02541	630
DH4	Door holder (floor/wall)	626

.26 Bumpers, as per ANSI/BHMA A156.16

LEG.	DESCRIPTION	FIN.
BU1	Dome floor stop L02141	626
BU2	Heavy duty floor stop L02131	626
BU3	Heavy duty wall bumper L02101	626
*In general, though floor stops are indicated in the hardware groups, provide wall stops at all doors; where the installation of a wall stop is not possible provide an overhead stop on the door.		

.27 Electro-magnets, as per ANSI/BHMA A156.23

LEG.	DESCRIPTION	FIN.
EM1	Surface electromagnetic lock E08501, 545 kg resistance minimum	628

.28 Door contacts

LEG.	DESCRIPTION	FIN.
MT1	Recessed magnetic door contact	white

.29 Magnetic catches as per ANSI/BHMA A156.16

LEG.	DESCRIPTION	FIN.
MT2	Recessed magnetic door contact E09081	606

.30 Weather-stripping: as per ANSI/BHMA A156.22

LEG.	DESCRIPTION	FIN.
WS1	Self-adhesive silicone base air gasket R0E155 x dimension as per hardware schedule	Black
WS2	silicone extrusion in aluminium extrusion, hardware compatible R0E164	628

.31 Sound seal as per ANSI/BHMA A156.22

LEG.	DESCRIPTION	FIN.
SS1	Self-adhesive silicone base air gasket R0E155 x dimension as per hardware schedule	Black

.32 Door bottoms as per ANSI/BHMA A156.22

LEG.	DESCRIPTION	FIN.
DB1	Heavy duty recessed automatic door bottom POY346	719
DB2	Nylon brush door sweep in an aluminium extrusion, 25 mm brush R0A416	628
DB3	Door bottom sweep for outside	719
DB4	Door bottom sweep for inside	NOIR

.33 Thresholds as per ANSI/BHMA A156.21

LEG.	DESCRIPTION	FIN.
SA1	Extruded aluminium threshold with thermal break x required depth J12190	628

.34 Delayed egress system as per ANSI/BHMA A156.24

LEG.	DESCRIPTION	FIN.
SW1	Key switch with double switch MO x MA to power on or off the system or reset. To be mounted in a standard 51 mm x 102 mm electric box	628
EB1	Power supply and delay controller in a metal box with keyed cover	689
AL1	Wall mounted alarm for delayed exit	630
PB1	Narrow stile push button for automatic door with weather resistant gasket (inside to disarm the alarm, Installation 1500mm height)	630
PB2	Adhesive sign	630
PB3	Wiring door diagram	630
PB4	Magnetic Card reader	630
EL1	Electrogard device	630

.35 Electric strikes as per ANSI/BHMA A156.31

LEG.	DESCRIPTION	FIN.
ES1	Heavy duty rim mounted electric strike for rim exit device with buzzer E09371	630
ES2	Heavy duty mortised electric strike for 19 mm latch E09321	630

.36 Automatic swing door operators, as per ANSI/BHMA A156.10

LEG.	DESCRIPTION	FIN.
SP1	Monitoring strike for deadbolt	630
OP1	Automatic full energy swing door operator with security detector (infrared on both sides) the operator must be equipped with a wind load feature able to compensate wind loads with a force of 150N maximum in opening and closing	628
PU1	150 mm round push button for automatic door	630
GR1	Wall mounted guard rail made of ½ x 1 3/4 aluminium bar with divider in the middle 36" w x 30"H	630

.37 Automatic swing door operators – low energy, as per ANSI/BHMA A156.19

LEG.	DESCRIPTION	FIN.
OP2	Automatic low energy swing door operator	628
PU1	150 mm round push button for automatic door	630
PU2	Narrow stile push button 44mm x 116mm for automatic door with weather resistant gasket	630

.38 Electro-magnetic holders as per ANSI/BHMA A156.15

LEG.	DESCRIPTION	FIN.
EH1	Wall mounted electromagnetic door holder, C00011 24 vdc	628
EB2	24 vdc 1 amp. power supply	

.39 Auxiliary Hardware as per ANSI/BHMA A156.16-2013

LEG.	DESCRIPTION	FIN.
DS3	Security hook	626
DS4	Quick connect cable 305 mm	630
DS5	Quick connect cable 4623 mm	630

2.5 Fastenings

- .1 Provide, via the various hardware manufacturers, screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware, as per each manufacturer's recommendations.
- .2 Exposed fastening devices to match finish of hardware.
- .3 Use stainless steel fasteners for stainless steel hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install pull in such a manner that it can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with the materials they penetrate.
- .6 Unless otherwise indicated, use countersunk Phillips head screws for attachment of kick plates, push plates, etc.

2.6 Keying

- .1 It is the architectural hardware distributor's responsibility to establish the keying schedule as per Departmental Representative's requirements.
- .2 This key system will be a visual key system, with keys and cylinders identified as per Departmental Representative's requirements.
- .3 All cylinders to be master-keyed on new master key system as well as on the construction keying system, as per Departmental Representative's requirements, that is construction master key x grand master key x master key x different key. Supply 10 copies of each grand master key and master key.
- .4 Supply and install temporary cylinders and keys during the construction period.
- .5 Install the permanent cylinders at the end of the construction period, when required by the Departmental Representative, before he takes possession.
- .6 Coding of keys used for this project will be the first code of each master key. Codes not used in this project will be used later by the Departmental Representative.
- .7 All permanent keys, including master keys, list of keys, the key code chart, the blank keys and all pinning shall be delivered directly from the manufacturer to the Departmental Representative, at the time of installation of the permanent cylinders, in clearly identified envelopes. Tag all keys.

2.7 Conduits for Electrified Hardware

- .1 See **Electrical**.

2.8 Accessories

- .1 Key cabinet: 20 gauge steel, 19 gauge door, piano hinges and key panels, epoxy finish at Departmental Representative's choice.
 - .1 Install in room 104, exact location will be coordinated on site.
 - .2 Refer to **Section 14 42 00 Wheelchair Lift** for wheelchair lift key cabinet with code, installed in room 203, exact location will be coordinated on site.
- .2 Install hinge pinch protections on all doors except doors 111, 112, 113, 109, 203.
 - .1 Rigid PVC Finger pinch protection devices with no resistance or restriction to the door operation and allowing over 180 degrees of operation, on push and pull side.
- .3 The quantities specified in each hardware group is the unit quantity required for each of the door referred to.

2.9 Hardware wheel chair lift doors 102A and 201A

- .1 See **Section 14 42 00 Wheelchair Lift**.

2.10 Hardware Schedule

.1 GROUP 01 STOREROOMS - DOORS 109, 111, 117, 206

QTY	DESCRIPTION	FINISH
3	HG8 - A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	652
1	LD4 - A156.2 – F07 LOCK STOREROOM Cylindrical lever lock storeroom function	626
1	CY4 – A156.5 - E19241 X E19251 KEY IN LEVER TYPE High security cylinder with key	626
1	DC6 – A156.4 – C02021 PARALLEL HEAVY DUTY RIGID ARM Surface power glide door closer with heavy duty parallel arm	689
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel kick plate with adhesive tape	630
1	BU3 – A156.16 – HEAVY DUTY LARGE WALL BUMPER	626

.2 GROUP 01A STOREROOMS - DOOR 112

QTY	DESCRIPTION	FINISH
3	HG8 - A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	652
1	LD4 - A156.2 – F07 LOCK STOREROOM Cylindrical lever lock storeroom function	626
1	CY4 – A156.5 - E19241 X E19251 KEY IN LEVER TYPE High security cylinder with key	626
1	DC5 – A156.4 – C02051 PARALLEL HEAVY DUTY RIGID ARM AND HOLD OPEN ARM Surface power glide door closer with heavy duty parallel arm and hold open arm	689
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel kick plate with adhesive tape	630
1	BU3 – A156.16 – HEAVY DUTY LARGE WALL BUMPER	626

.3 GROUP 02 STOREROOM DC - DOORS 113, 203

QTY	DESCRIPTION	FINISH
3	HG8 - A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	652
1	LD4 - A156.2 – F07 LOCK STOREROOM Cylindrical lever lock storeroom function	626
1	CY4 – A156.5 - E19241 X E19251 KEY IN LEVER TYPE High security cylinder with key	626
1	DC6 – A156.4 – C02021 PARALLEL HEAVY DUTY RIGID ARM Surface power glide door closer with heavy duty parallel arm	689
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel kick plate with adhesive tape	630
1	WS1 – A156.22 SELF ADHESIVE SEALGASKET Adhesive gasket installed on both side jambs & head	black
1	DB1 – A156.22 - POY346 HEAVY DUTY MORTISED AUTOMATIC DOOR BOTTOM Automatic door bottom full mortise for hollow metal door	
1	BU3 – A156.16 – HEAVY DUTY LARGE WALL BUMPER	626
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP for 203 only	626

.4 GROUP 03 POCKET DOOR - 105A, 116, 119, 205, 208, 210

QTY	DESCRIPTION	FINISH
1	TK1 - A156.14 – POCKET DOOR FRAME WHIT SLIDING DOOR HARDWARE Pocket door kit	628
2	SP3 - A156.14 – FLOOR DOOR GUIDE Floor door guide	628
1	SP4 - A156.14 GUIDE CHANNEL Guide channel	628
2	SP5 - A156.14 IN TRACK DOOR STOP In track door stop	628
2	DP 6 - A156.6 Rectangular flush pull	626
1	DP 7 - A156.6 CONCEALED DOOR PULL Concealed door pull	626

Note: Allow 6mm of space between the two sides of the door and the frame to install the self-adhesive tape.

.5 GROUP 04 OFFICE - DOORS 104, 105

QTY	DESCRIPTION	FINISH
3	HG8 – A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	652
1	LD1 - A156.2 – F04 LOCK OFFICE Cylindrical lever lock office function	626
1	CY4 – A156.5 - E19241 X E19251 KEY IN LEVER TYPE High security cylinder with key	626
1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER CONCAVE	626
1	DB1 – A156.22 - POY346 HEAVY DUTY MORTISED AUTOMATIC DOOR BOTTOM Automatic door bottom full mortise for wood door	719
1	WS1 – A156.22 SELF ADHESIVE SEAL GASKET Adhesive gasket installed both side jambs and head	black

.6 GROUP 05 CLASSROOM DUTCH - DOORS 114, 118, 204

QTY	DESCRIPTION	FINISH
4	HG8 - A156.1 - A8112 NRP X 114 X 101 Four knuckles hinge with non-friction pads and non-removable pin	652
1	LD2 - A156.2 – F05 LOCK CLASSROOM Cylindrical lever lock classroom function	626
1	CY4 – A156.5 - E19241 X E19251 KEY IN LEVER TYPE High security cylinder with key	626
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP	626
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel Kick plate with adhesive tape	630
1	SB1 - A156.16 – SURFACE BOLT FOR TOP PANEL Surface Dutch door bolt	626
1	DH4 - A156.16 – WALL DOOR HOLDER Door Holder (upper section)	626
1	DH4 - A156.16 – FLOOR DOOR HOLDER Door holder	626

.7 GROUP 05A CLASSROOM DUTCH - DOORS 108, 207, 209

QTY	DESCRIPTION	FINISH
4	HG8 - A156.1 - A8112 NRP X 114 X 101 Four knuckles hinge with non-friction pads and non-removable pin	652
1	LD2 - A156.2 – F05 LOCK CLASSROOM Cylindrical lever lock classroom function	626
1	CY4 – A156.5 - E19241 X E19251 KEY IN LEVER TYPE High security cylinder with key	626
1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER	626
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel kick plate with adhesive tape	630
1	DS4 - A156.16 – SURFACE DUTCH DOOR BOLT Surface Dutch door bolt	626
1	DH4 - A156.16 – WALL DOOR HOLDER Door Holder (upper section)	626

.8 GROUP 06 PASSAGE DB - DOORS 115, 120

QTY	DESCRIPTION	FINISH
3	HG8 - A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	652
1	LD7 - A156.2 – F01 LOCK PASSAGE Cylindrical lever lock passage function	626
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP	626
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel kick plate with adhesive tape	630
1	WS1 – A156.22 SELF ADHESIVE SOUND SEAL Adhesive gasket installed both side jams and head	black

.9 GROUP 07 PRIVACY - DOORS 110, 202

QTY	DESCRIPTION	FINISH
3	HG8 - A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	652
1	LD6 - A156.2 – F22 LOCK PRIVACY Cylindrical lever lock privacy function	626
1	DC8 – A156.4 – C020211 HEAVY DUTY DOOR CLOSER DELAYED ACTION Surface power glide door closer with regular arm and adjustable delayed action	689
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel kick plate with adhesive tape	630

1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER CONCAVE	626
---	--	-----

.10 **GROUP 08 CLASSROOM PB - DOORS 121A**

QTY	DESCRIPTION	FINISH
1	HG2 - A156.26 – A51021B CONTINUOUS HINGE Stainless steel continuous hinge barrel type edge mount	630
1	ED11 – A156.3 - HEAVY DUTY RIM TYPE EXIT Rim exit devise class function with lever handle	630
1	CY1 – A156.5 - E19241 X E19251 MORTISE CYLINDER WITH KEY High security cylinder with key	626
1	ES1-A156.31 Electric strike with buzzer	HES
1	DC9 - A156.4 – C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track	689
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP	626
1	DB3 – A156.22 Door bottom sweep for outside	719
2	DP2– A156.6 – STAINLESS STEEL DOOR PULL U SHAPE Grip offset door handle	630
1	DB4 – A156.22 Door bottom sweep for inside	Noir

Note: Threshold and cold cut supplied by the manufacturer of aluminum doors and frames

.11 **GROUP 08B CLASSROOMS - DOORS 106, 201, 211,102**

QTY	DESCRIPTION	FINISH
3	HG8 - A156.1 - A8112 NRP X 114 X 101 Three knuckles hinge with non-friction pads and non-removable pin	630
1	ED12 – A156.3 – HEAVY DUTY RIM TYPE EXIT FIRE RATED Rim exit devise passage function with lever handle	630
1	DC9 - A156.4 – C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track	689
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel Kick plate with adhesive tape	630
1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER	626
1	DB1 – A156.22 - POY346 HEAVY DUTY MORTISED AUTOMATIC DOOR BOTTOM Automatic door bottom full mortise for hollow metal door	719
1	WS1 – A156.22 SELF ADHESIVE SEAL GASKET	black

	Adhesive gasket installed both side jambs and head	
--	--	--

.12 GROUP 08C CLASSROOM PB - DOORS 101A

QTY	DESCRIPTION	FINISH
1	HG2 - A156.26 – A51021B CONTINUOUS HINGE Stainless steel continuous hinge barrel type edge mount	630
1	ED11 – A156.3 - HEAVY DUTY RIM TYPE EXIT Rim exit devise class function with lever handle	630
1	CY1 – A156.5 - E19241 X E19251 MORTISE CYLINDER WITH KEY High security cylinder with key	626
1	ES1-A156.31 Electric strike with buzzer	HES
1	DC9 - A156.4 – C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track	689
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP	626
1	DB3 – A156.22 Door bottom sweep for outside	719
2	DP2– A156.6 – STAINLESS STEEL DOOR PULL U SHAPE Grip offset door handle	630
1	DB4 – A156.22 Door bottom sweep for inside	Noir

Note: Threshold and cold cut supplied by the manufacturer of aluminum doors and frames

.13 GROUP 09 DEADBOLT - DOORS 114A, 118A

QTY	DESCRIPTION	FINISH
1	HG2 - A156.26 – A51021B CONTINUOUS HINGE Stainless steel continuous hinge barrel type edge mount	630
1	DD1 – A156.36 – E06091 DEADBOLT MORTISE Mortise deadbolt	630
2	CY1 – A156.5 – E19241 X E19251 MORTISE CYLINDER WITH KEY Mortise cylinder with key	626
2	DP2– A156.6 – STAINLESS STEEL DOOR PULL U SHAPE Grip offset door handle	630
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP	626
1	DC9 - A156.4 - – C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track	689

Note: Threshold and cold cut supplied by the manufacturer of aluminum doors and frames

.14 **GROUP 10 SLIDING DOORS - DOORS 105B**

QTY	DESCRIPTION	FINISH
1	SD1 - A156.14 SLIDING DOOR WHIT COMPLETE HARDWARE Sliding double door with complete hardware	628
1	SD2 - A156.14 SLIDING DOOR FASCIA AND CAP Fascia and end cap	628
2	SP3 - A156.14 – FLOOR DOOR GUIDE Floor door guide	628
1	SP4 - A156.14 GUIDE CHANNEL Guide Channel	628
2	SP5 - A156.14 IN TRACK DOOR STOP In track door stop	628
2	DP3-A156.6 RECESSED FLUSH PULL J403 Flush door pull	630

.15 **GROUP 11 CLASSROOM ELECTROGUARD PB 3/15 - DOOR 101**

QTY	DESCRIPTION	FINISH
4	HG8 - A156.1 - A8112 NRP X 114 X 101 Four knuckles hinge with non-friction pads and non-removable pin	630
1	HG11-A156.1 Concealed electrical power transfer with quick connect cable	630
1	EL1 – A156.24 Rim exit devise class function with electroguard and lever handle	630
2	CY1 – A156.5 - E19241 X E19251 MORTISE CYLINDER WITH KEY High security cylinder with key	626
1	DC9 - A156.4 – C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track	689
1	ES1-A156.31 Electric strike with buzzer	630
1	PB1 – A156.24 – PUSH BUTTOM (to be installed in the supervisor office 104, location to be confirmed by Departmental Representative)	630
1	PB1 – A156.24 – PUSH BUTTOM (to be installed from 102 side, 1524 mm from F.F. to center of push button)	630
1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER	626
1	DB3 – A156.22 - DOOR BOTTOM SWEEP FOR OUTSIDE Automatic door bottom full mortise for hollow metal door	719
1	DS4 – A156.24 – QUICK CONNECT CABLE 305 MM	

	Quick connect cable	
1	DS5 – A156.24 – QUICK CONNECT CABLE 4623 MM Quick connect cable	
1	EB1-A156.24 Power supply with battery back-up and key lock	600
1	PB2 – A156.24 – ADHESIVE SIGN (see 6/A-611 signage) Adhesive sign	White red
1	PB3 – A156.24 – WIRING DOOR DIAGRAM	
2	PB4 – A156.24 – CARD READER (by other) Card reader (1 both side of the door)	

Note: Threshold and cold cut supplied by the manufacturer of aluminum doors and frames

Note: Electric conduits, electric junction boxes, electric wiring of the 120V power source, card reader and accessories are all excluded from this Section, see Specification for coordination and refer to **Electrical**.

.16 **GROUP 11A CLASSROOM ELECTROGUARD (HOLD OPEN) PB 3/15 - DOOR 106A**

QTY	DESCRIPTION	FINISH
1	HG2 - A156.26 – A51021B CONTINUOUS HINGE Stainless steel continuous hinge barrel type edge mount	630
1	HG11-A156.1 Concealed electrical power transfer with quick connect cable	630
1	EL1 – A156.24 Rim exit devise class function with electroguard and lever handle	630
2	CY1 – A156.5 - E19241 X E19251 MORTISE CYLINDER WITH KEY High security cylinder with key	626
1	ES1-A156.31 Electric strike with buzzer	630
1	DC10 - A156.4 - C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track with hold open	689
1	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH Stainless steel Kick plate with adhesive tape	630
1	BU1 – A156.16 – HEAVY DUTY FLOOR DOME STOP	626
1	DB3 – A156.22 - DOOR BOTTOM SWEEP FOR OUTSIDE Automatic door bottom full mortise for hollow metal door	719
2	DP2- A156.6 – STAINLESS STEEL DOOR PULL U SHAPE Grip offset door handle	630
1	WS1 – A156.22 SELF ADHESIVE GASKETING Adhesive gasket installed both side jambs and head	black
1	DS4 – A156.24 – QUICK CONNECT CABLE 305 MM	

	Quick connect cable	
1	DS5 – A156.24 – QUICK CONNECT CABLE 4623 MM Quick connect cable	
1	EB1-A156.24 Power supply with battery back-up and key lock	600
1	PB2 – A156.24 – ADHESIVE SIGN (see 6/A-611 signage) Adhesive sign	White red
1	PB3 – A156.24 – WIRING DOOR DIAGRAM	
2	PB4 – A156.24 – CARD READER (by other) Card reader (1 both side of de door)	

Note: Threshold and cold cut supplied by the manufacturer of aluminum doors and frames

Note: Magnetic card reader by other, see **Electrical**.

Electric conduits, electric junction boxes, electric wiring of the 120V power source, card reader and accessories are all excluded from this Section, see Specification for coordination and refer to **Electrical**.

.17 **GROUP 11B CLASSROOM ELECTROGUARD PB 3/15 - DOOR 121**

QTY	DESCRIPTION	FINISH
4	HG8 - A156.1 - A8112 NRP X 114 X 101 Four knuckles hinge with non-friction pads and non-removable pin	630
1	HG11-A156.1 Concealed electrical power transfer with quick connect cable	630
1	EL1 – A156.24 Rim exit devise class function with electroguard and lever handle	630
2	CY1 – A156.5 - E19241 X E19251 MORTISE CYLINDER WITH KEY High security cylinder with key	626
1	PB1 – A156.24 – PUSH BUTTOM (to be installed from 102, 1524 mm from F.F. to center of push button)	630
1	ES1-A156.31 Electric strike with buzzer	630
1	DC9 - A156.4 - C020211 HEAVY DUTY DOOR CLOSER Cam action door closer with push side track	689
1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER	626
1	DS4 – A156.24 – QUICK CONNECT CABLE 305 MM Quick connect cable	
1	DS5 – A156.24 – QUICK CONNECT CABLE 4623 MM Quick connect cable	
1	EB1-A156.24 Power supply with battery back-up and key lock	600
1	PB2 – A156.24 – ADHESIVE SIGN (see 6/A-611 signage) Adhesive sign	White red

1	PB3 – A156.24 – WIRING DOOR DIAGRAM Wiring door diagram	
2	PB4 – A156.24 – CARD READER (by other) Card reader (1 both side of de door)	

.18 GROUP 12 DEADBOLT - DOORS EXT-01

QTÉ	DESCRIPTION	FINI
1	HG2 - A156.26 – A51021B CONTINUOUS HINGE Stainless steel continuous hinge barrel type edge mount	630
1	DD1 – A156.36 – E06091 DEADBOLT MORTISE Mortise deadbolt	626
2	CY1 – A156.5 – E19241 X E19251 MORTISE CYLINDER WITH KEY Mortise cylinder with key	626
1	KP1 – A156.6 – J102 KICK PLATE X 254 WIDTH (INSIDE) Stainless steel Kick plate with adhesive tape	630
2	DP2– A156.6 – STAINLESS STEEL DOOR PULL U SHAPE Grip offset door handle	630
1	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER	626

.19 GROUP 13 DEADBOLT - DOORS EXT-02

QTÉ	DESCRIPTION	FINI
2	HG2 - A156.26 – A51021B CONTINUOUS HINGE Stainless steel continuous hinge barrel type edge mount	630
1	DD1 – A156.36 – E06091 DEADBOLT MORTISE Mortise deadbolt	626
2	CY1 – A156.5 – E19241 X E19251 MORTISE CYLINDER WITH KEY Mortise cylinder with key	626
2	KP1 – A156.6 – J102 KICK PLATE X 254 X WIDTH (INSIDE) Stainless steel Kick plate with adhesive tape	630
2	DP2– A156.6 – STAINLESS STEEL DOOR PULL U SHAPE Grip offset door handle	630
2	BU3 – A156.16 – HEAVY DUTY WALL LARGE BUMPER	626
1	AS2 – A156.22 - ASTRAGAL Surface meeting stile astragal	626
2	SB2 – A156.16 – SURFACE BOLT Surface bolt 152 mm	626

Note: Threshold and cold cut supplied by the manufacturer of aluminum doors and frames

Note: Magnetic card reader by other, see **Electrical**.

Electric conduits, electric junction boxes, electric wiring of the 120V power source, card reader and accessories are all excluded from this Section, see Specification for coordination and refer to **Electrical**.

3.0 EXECUTION

3.1 Coordination

- .1 Coordinate with **Departmental Representative**, **door and frame manufacturers**, as well as **Electrical**, for proper installation of hardware and electrified hardware, including the wiring requirements.
- .2 Provide metal and aluminium door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.

3.2 Installation

- .1 Install hardware in accordance with instructions and recommendations of each manufacturer, good practice and published recommendations by DHI (Doors and Hardware Institute).
- .2 Install hardware to standard location dimensions in accordance with "Canadian Metric Guide for Steel Doors and Frames (Modular Construction)" prepared by CSDFMA, or according to requirements of DHI ("Recommended Locations for Builder's Hardware") and hardware manufacturer's instructions.
- .3 Where door bumper makes contact with door pulls, mount bumper to strike bottom of pull.
- .4 Keep the construction cylinders for the exterior door locks in place until building is delivered to the Departmental Representative.

3.3 Installation of Electrified Hardware

- .1 See **Electrical** and **Security** drawings.

3.4 Verification and Adjustments

- .1 Check and adjust every item of finish hardware for each door for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Check all keys and master keys; replace defective keys and cylinders.
- .3 Check and adjust door closers after the final pressurization and balancing of the building are completed by **Mechanical**.
- .4 All installed hardware shall function smoothly, without abnormal noise or restriction, with the appropriate fastenings and accessories.
- .5 Lubricate moving parts with product recommended by the hardware manufacturer.

- .6 Replace all items which cannot be adjusted and/or will not function adequately after lubrication.
- .7 Ensure that all doors in door assemblies with a fire-protection rating of 20min have clearances of not more than 6mm at the bottom and not more than 2mm at the sides and top (article 3.1.8.12. 3) of the N.B.C).

3.5 Cleaning

- .1 Perform cleaning as per **Section 01 74 11**.

End of Section

1.0 GENERAL

1.1 References

- .1 Comply with all standards mentioned in this specification, unless more stringent requirements are given herein.
- .2 ASTM International
 - .1 ASTM C 542-05, Standard Specification for Lock-Strip Gaskets.
 - .2 ASTM D 790-07e1, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 - .3 ASTM D 1003-07e1, Standard Test Method for Haze and Luminous Transmittance of Plastics.
 - .5 ASTM D 1929-96(R2001)e1, Standard Test Method for Determining Ignition Temperature of Plastics.
 - .6 ASTM D 2240-05, Standard Test Method for Rubber Property - Durometer Hardness.
 - .7 ASTM E 84-10, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .8 ASTM F 1233-08, Standard Test Method for Security Glazing Materials and Systems.
- .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-12.8-97 (Jan.01), Insulating Glass Units
 - .4 CAN/CGSB-12.20-M89, Structural Design of Glass for Buildings
- .4 Glass Association of North America (GANA)
 - .1 Glazing Reference Manual 2009
- .5 Laminators Safety Glass Association (LSGA).
 - .1 LSGA Laminated Glass Design Guide 2000.

1.2 Design Criteria

- .1 Glass thickness shall be such that the probability of breakage shall not exceed 8/1000 under average loading on the glazing. Calculations shall be performed by a qualified engineer using procedures outlined in CAN/CGSB-12.20.
- .2 The mechanical resistance of glass shall be such that, under the influence of exterior environmental elements (solar radiation, air temperature, sun screens, etc.) and interior conditions (air temperature, heating & cooling systems, shades, etc.) that generate thermal stresses at glazing edges, the probability of breakage shall not exceed 8/1000. Calculations shall be performed by a qualified engineer using procedures outlined in CAN/CGSB-12.20.
- .3 Under design loading of the glazing (perpendicular to it), the centre point deflection of a window (glazing panel) shall not exceed 6 mm with respect to the edge. Calculations shall be performed by a qualified engineer using procedures outlined in CAN/CGSB-12.20.
- .4 Under the influence of barometric pressure fluctuations, air temperature & solar radiation, the buckling

of the exterior panes of glass in a glazed panel which reflects images (buildings, objects) back to passing pedestrians, shall not exceed 1/700 of the shortest span of window. Calculations shall be performed by a qualified engineer following good engineering practices.

- .5 Window W10: window metal frame, its glazing and the complete assembly must be designed to withstand NBC's specified lateral loads for balcony guards.

1.3 Action and Informational Submittals

- .1 Provide submittals in accordance with **Section 01 33 00** and the following requirements:
- .1 **Shop drawings** : Window W10's glazing shop drawings shall be stamped and signed by professional engineer, who is a member in good standing of the Northwest Territories and Nunavut Association of Professional Engineers and Geoscientists (NAPEG) and must attest conformity to **Design criteria**.
 - .1 **Certificates of conformity**: submit certificates for sealed double-glazed units, showing compliance with IGCC requirements.
 - .2 **Product samples**: submit a 300X300 sample of each type of glass material, including an insulating glass sample comprising all its components.
 - .3 **Operation and maintenance data**: submit instructions for the maintenance of mirrors.

1.4 Delivery, Storage and Handling

- .1 Deliver materials to specified destination in manufacturer's or distributor's packaging, undamaged, complete with installation instructions.

1.5 Waste Management

- .1 Separate waste materials for disposal, re-use and recycling in accordance with **Section 01 74 19**.

2.0 PRODUCTS

2.1 General

- .1 Glass materials and assemblies given below shall be used in doors, windows, frames and other applications as per indicated on **Architecture** drawings.
- .2 Thicknesses specified herein are minimums. Thicknesses must be adjusted according to glazing panel dimensions and design criteria prescribed in the present Section, as well as the performance requirements specified in **Sections 08 41 13 and 08 50 00**, and be submitted to the Departmental Representative for review.

2.2 Glass Materials

- .1 **Type V4: Tempered and Laminated glass**: clear safety glass, as per CAN/CGSB-12.1
- .1 2 x 3 mm Tempered, regular glass, laminated with clear interlayer 1.5 mm thick, for a total thickness of 7.5 mm.
- .2 **Type V6: Sealed Insulating Glass For Windows, storefronts aluminium frames and aluminium doors**:

-
- .1 Insulating glass units: to CAN/CGSB-12.8, double unit, 25 mm overall thickness.
 - .1 Glass: to CAN/CGSB-12.1 and CAN/CGSB-12.3.
 - .2 Exterior glass: 10 mm, clear colour, tempered.
 - .3 Interior glass: 6 mm, clear, tempered with Low-E coating on no.3 position.
 - .2 Air cavity thickness : 12 mm between interior and exterior glass with thermal break spacer, low thermal conductivity, black polycarbonate, steel reinforced, U factor of 0.50 W/m²*K
 - .3 Low-E on face no.3, with following performance. :
 - .1 Visible light transmission: 59%
 - .2 Exterior visible light reflexion :10%
 - .3 Interior visible light reflexion: 10%
 - .4 Solar transmission: 26%
 - .5 Solar gain: 0.40
 - .6 Shading value: 0.43
 - .7 Winter U value: 0,24
 - .8 % initial filling of Argon gaz: 85%
 - .4 Internal gaz filling: argon.
 - .5 Polyisobutyl and silicone double sealer.
- .3 **Type V10: Laminated glass (acoustical for windows type W09):** clear safety glass, as per ASTM C1503
- .1 2 glass: 1 x 12 mm and 1 x 6 mm, regular glass, laminated with clear interlayer 1.5 mm thick, for a total thickness of 7.5 mm.
- .4 **Type V11: Glass ceramic for openings in fire doors with a fire resistance:** to CAN / CGSB-12.11.
- .1 Clear glass ceramic glass, to avoid visual distortion and annoying effect, with surface-applied safety film, fire resistant 45 minutes, UL 9, 10B, UL 10C, NFPA 80, NFPA compliant 252, NFPA 257 and CAN / ULC S104, S106.
 - .2 Total thickness of 5mm glass ceramic glass with a tolerance of + 0.4mm to -0.4mm.
 - .3 Meeting CPSC impact standards 16CFR 1201-CAT I & II, CAN / CGSB-12.1-M and ANSI Z97.1.
 - .4 Glass performance requirements;
 - .1 Visible light transmission: 88%
 - .2 Soundproofing level (STC rating): 35
 - .3 U Value: 0.88
 - .4 Weight: 2.4 lbs / ft²
- .5 **Type V12: Fire-Rated Laminated Polished Safety Glass Ceramic for windows with a fire resistance:** to CAN/ULC-S106, S104
- .1 Listed and labeled with Underwriters Laboratories Inc. File #R14515
 - .2 Tested in accordance with UL 9, UL 10B, UL 10C, NFPA 80, NFPA 252, NFPA 257.
 - .3 Meeting CPSC impact standards 16CFR 1201-CAT I & II, CAN / CGSB-12.1-M and ANSI Z97.1.
 - .4 Thickness : 8mm with a tolerance of + 0.4mm to -0.4mm.
 - .5 Glass performance requirements;
 - .1 Visible light transmission: 82%
 - .2 Soundproofing level (STC rating): 37
 - .3 U Value: 0.88
 - .4 Weight: 4.1 lbs / ft²
-

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, 10-15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; size as required; 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; mm size.
- .4 Glazing clips: manufacturer's standard type.
- .5 Lock-strip gaskets: to ASTM C 542.
- .6 Clear Anodized aluminum extrusion, profile as indicated.
- .7 Structural glazing sealant: High tensile strength sealant, silicone based, one-component neutral-curing sealant.
- .8 Sealants : refer to **Section 07 92 00 – Joint sealants**

2.4 Fabrication

- .1 All sealed double and triple glazed units to be manufactured as per CAN/CGSB-12.8 and by a manufacturer who has certified these units in accordance with the IGCC Certification Programme. The insulating glass product must bear a valid number on the latest IGCC Certified Products List and be properly identified per the IGCC Certification Programme, using the materials specified herein.
- .2 All tempered glass must be produced by the horizontal roller hearth method, and bear a discrete mark of being so treated.

3.0 EXECUTION

3.1 General

- .1 Installation to be performed in accordance with FGMA Glazing Manual, GANA "Glazing Reference" and the manufacturer's recommendations, best practice of the trade and with highest precision and accuracy, to achieve first class work.
- .2 Defective installations shall be replaced at no cost. No imperfection will be tolerated.
- .3 Any imperfections, dust or debris on glazed surfaces visible after installation will be cause for rejection of the work.

3.2 Installation of Single Glazing

- .1 Remove protective coatings and clean contact surfaces with solvent and wipe dry, according to the manufacturer of the glazing tape.
- .2 Set adjacent units of glass with uniformity to pattern, draw, bow, and similar characteristics.
- .3 Apply primer-sealer to contact surfaces.
- .4 Cut glazing tape to the appropriate length and install continuous on all four sides against permanent stop, uniformly 1.5 mm below sightline.
- .5 If required, place temporary setting blocks as per manufacturer's instructions, at quarter points of glass, with edge block no more than 200 mm from corner, sufficiently recessed to allow space for sealant in case blocks are to remain in place permanently.
- .6 If required, insert temporary spacer shims to center glass in space. Place shims at 600 mm centres.
- .7 Remove the anti-adhesion paper from the spacers.
- .8 Install glass, rest on setting blocks, press firmly to ensure full contact and adhesion at perimeter.
- .9 Provide edge clearance of 3 mm minimum.
- .10 Install glazing beads taking care not to displace the glazing tape and applying enough pressure to ensure full contact and adhesion at the perimeter.
- .11 Knife trim protruding tape.
- .12 Apply cap bead of silicone sealant to full depth, where indicated.
- .13 Apply sealant to uniform and level line, flush with adjoining surfaces and tooled or wiped with solvent to smooth appearance, bevelled to form watershed away from glass.
- .14 Polish all exposed glass edges.
- .15 Do not cut or abrade tempered or coated glass.

3.3 Installation of Sealed Double Glazing in aluminium windows, doors and frames

- .1 Install glazing for door by the dry method both for the interior and the exterior, or as per the manufacturer's recommendations.
- .2 Cut preformed glazing tape to length and set against permanent stops aligned and level with the 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 3 points, with edge block maximum 150 mm from corners.
 - .5 Rest glazing on setting blocks and push against tape and heel bead of sealant with sufficient pressure to ensure full contact at perimeter of light or glass unit.
 - .6 In a similar manner place glazing tape against the glass unit and install removable stops.

3.4 Protection and Cleaning

- .1 Perform cleaning as per **Section 01 74 11**.
- .2 Protect glass from contact with contaminating substances resulting from construction activities. Remove such substances by method approved by manufacturer.
- .3 Immediately remove sealant and compound droppings from finished surfaces.
- .4 Remove labels after work is completed, except permanent labels.
- .5 Wash glass on both faces not more than four days prior to date scheduled for inspections intended to establish date of Substantial Performance of the Work. Wash glass by method recommended by glass manufacturer.
- .6 Clean and leave glazed panels in scratch-free condition inside and out.

End of Section