PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED SECTIONS

.1 Section 07 92 00: Joint Sealing.

.2 Section 08 14 00: Wood Doors.

.3 Section 08 34 73: Sound Control Door Assemblies.

.4 Section 08 71 00: Door Hardware.

.5 Section 08 80 00: Glazing.

.6 Section 09 91 00: Painting.

1.3 REFERENCES

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

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

.3 American Society for Testing and Materials (ASTM).
- .1 ASTM A653/653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM E 152, Methods for Fire Tests of Door Assemblies.

.4 Underwriters' Laboratories of Canada (ULC).
- .1 CAN4-S104, Standard Method for Fire Tests of Door Assemblies.
- .2 CAN4-S105, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN 4-S104.
- .3 CAN/ULC-S702, Standard for Thermal Insulation, Mineral Fiber for Buildings.
- .4 CAN/ULC-S704, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

.5 Canadian Steel Door Manufacturers' Association, (CSDMA).
- .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames.
- .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors.

.6 National Fire Protection Association (NFPA).
- .1 NFPA 80, Standard for Fire Doors and Fire Windows.
- .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

1.4 DESIGN REQUIREMENTS

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

1.5 SHOP DRAWINGS

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

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

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

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

1.6 REQUIREMENTS OF REGULATORY AGENCIES

.1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4 S104M for ratings specified or indicated. Fire rated doors, frames and sidelights shall bear ULC labels.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E152 or NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers. Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

.3 Listing labels are to be installed on doors and frames at place of manufacture and not on site. Stamped listings will not be acceptable due to the fact the stampings are obscured by painting and difficult to verify. Factory applied labels must not be covered by paint.

1.7 PRODUCT HANDLING

.1 Tag doors and frames at shop with identification marks indicating proper location for installation.

.2 Deliver, store and handle components so as to prevent damage, distortion and corrosion. Store components off the ground and under cover in a dry protected area. Stack doors and frames to prevent twisting. Do not enclose components in plastic covers without venting.

1.8 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction Waste Management & Disposal.

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

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

.4 Fold up metal banding, flatten and place in designated area for recycling.

PART 2 - PRODUCTS

2.1 **MATERIALS**

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

.2 Reinforcement: to CAN/CSA-640.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

.3 Sheet steel: cold rolled, commercial quality to ASTM A366, with matt finish.

.4 Doors and Frames:

.1 Acceptable products:

.1 Apex Machine Works Limited
.2 Baron Metal Industries Ltd.
.3 Artek Door (1985) Ltd.
.4 S.W. Fleming Ltd.
.5 Ali-Porte Manufacturers of Steel Frames and Metal Doors, St. Laurent, Que.
.6 or approved equal

.5 Doors:

.1 Door face sheets 1.6 mm base thickness.

.6 Door Core Materials:
- .1 Honeycomb construction (interior doors): Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m3 minimum sanded to required thickness.
- .2 Insulated Core (exterior doors):
  - .1 Fibreglass: to CAN/ULC-S702, semi-rigid type, density 24 kg/m3.
  - .2 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m3.
  - .3 Polyurethane: to CAN/ULC-S704 rigid, modified poly/isocyanurate, closed cell board. Density 32 kg/m^3.
- .3 Fire rated doors: in accordance with CAN4-S104, ASTM E 152 or NFPA 252, covering standard Method of Tests of Door Assemblies and listed by ULC or Warnock Hersey.

.7 Frames: Steel frames 1.6 mm base thickness.

.8 Provide other door and frame components in accordance with CSDMA requirements.

.9 Touch-up Primer: to CAN//CGSB-1.181.

.10 Adhesives:
- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement..
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement, low VOC.
- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive, low VOC.

.11 Accessories:
- .1 Door silencers: single stud rubber/neoprene type.
- .2 Top and bottom caps (interior doors): rigid polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Glazing stops: formed channel, minimum 1.5 mm thick x 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws. Glazing stops at outside of exterior doors and frames shall be rendered non-removable.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal, riveted.

.12 Glazing: As specified in Section 08 80 00 – Glazing.

2.2 **FRAME FABRICATION – GENERAL**

.1 Fabricate frames to Canadian Steel Door Manufacturers' Association, (CSDMA) Canadian Manufacturing Specifications for Steel Doors and Frames; except where specified otherwise.

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

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

.4 Interior frames: 1.6 mm, welded type construction.

.5 Reinforce frames to suit hardware requirements specified Section 08 71 00 - Door Hardware. Blank, reinforce, drill and tap frames for mortised templated hardware, using templates provided by door hardware supplier. Reinforce frames for surface mounted hardware.

.6 Protect mortised cutouts with steel guard boxes.

.7 Prepare frames for door silencers, 3 for single door, 2 at head for double door.

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

.9 Conceal fastenings except where exposed fastenings are indicated.

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

.11 Insulate exterior frame components with fibreglass insulation.

.12 Where electrified hardware is specified on the approved hardware schedule, steel door and frame product shall be provided with ElectroLynx™ System consisting of CSA approved conduit, junction boxes and wire harnesses complete with modular plugs for coordinated connection directly to electrified hardware. Refer to Section 08 71 00 – Door Hardware and Door Schedule drawings for openings that require electrified hardware.

2.3 **FRAME ANCHORAGE**

.1 Provide appropriate anchorage to floor and wall construction.

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

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

.4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm o.c. maximum.

2.4 **FRAMES: WELDED**

.1 Welding in accordance with CSA W59.

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

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

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

.5 Securely attach adjustable floor anchors to inside of each jamb profile for fixing at floor.

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

.7 Make provision for glazing as indicated and provide necessary glazing stops.

2.5 **DOOR FABRICATION – GENERAL**

.1 Fabricate doors to Canadian Steel Door Manufacturers' Association, (CSDMA) Canadian Manufacturing Specifications for Steel Doors and Frames; except where specified otherwise. Reinforce doors to suit hardware requirements specified Section 08 71 00 - Door Hardware.

.2 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated. Make provision for glazing as indicated and provide necessary glazing stops.

.3 Exterior doors: insulated hollow steel construction. Interior doors (non-rated): honeycomb construction.

.4 Fabricate doors with longitudinal edges locked seamed. Seams: fill with metallic paste filler and sand to a uniform smooth finish. Construct rail and stile doors in same manner as flush doors. Construct matching panels in same manner as doors.

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

.6 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation. Reinforce doors where required, for surface mounted hardware. Hardware reinforcements shall be minimum 3.42 mm (10 Ga.) thick.

.7 Provide flush, inverted, PVC top caps extending full width of door at interior doors. Provide inverted, flush, steel, spot welded channels to top and bottom of exterior doors.

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

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

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

.11 Where electrified hardware is specified on the approved hardware schedule, steel door and frame product shall be provided with ElectroLynx™ System consisting of CSA approved conduit, junction boxes and wire harnesses complete with modular plugs for coordinated connection directly to electrified hardware. Refer to Section 08 71 00 – Door Hardware for openings that require electrified hardware.

2.6 DOORS: HONEYCOMB CORE CONSTRUCTION

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

2.7 DOORS: HOLLOW STEEL CONSTRUCTION

.1 Form each face sheet for exterior doors from 1.6 mm sheet steel. Form sheets for interior doors from 1.6 mm sheet steel.

.2 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.

.3 Fill voids between stiffeners of exterior doors with fibreglass core.

.4 Fill voids between stiffeners of interior doors with honeycomb core or temperature rise rated core at fire rated doors where indicated on drawings.

2.8 THERMALLY BROKEN DOORS AND FRAMES

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

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

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

.4 Apply insulation.

2.9 ACOUSTIC DOORS AND FRAMES

.1 Acoustic door and frame assemblies as per Section 08 34 73 – Sound Control Door Assemblies.

PART 3 - EXECUTION

3.1 INSTALLATION – GENERAL

.1 Install labelled steel fire rated doors and frames in accordance with National Fire Protection Association (NFPA) 80 except where specified otherwise.

.2 Install doors and frames to Canadian Steel Door Manufacturers' Association, (CSDMA) Installation Guide.

3.2 FRAME INSTALLATION

.1 Set frames plumb, square, level and at correct elevation. Secure anchorages and connections to adjacent construction.

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

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

.4 Caulk perimeter of frames between frame and adjacent material. Maintain continuity of air barrier and vapour retarder.

.5 Install door silencers.

3.3 DOOR INSTALLATION

.1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.

.2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:

.1 Hinge side: 1.0 mm.
.2 Latchside and head: 1.5 mm.
.3 Finished floor noncombustible sill and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

3.4 FINISH REPAIRS

.1 Touch up with primer galvanized finish damaged during installation.

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

3.5 GLAZING

.1 Install glazing for doors and frames in accordance with Section 08 80 00 - Glazing.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED WORK

.1 Section 05 50 00: Metal Fabrications.

.2 Section 06 10 00: Rough Carpentry.

.3 Section 07 92 00: Joint Sealing.

.4 Section 08 71 00: Door Hardware.

.5 Section 08 80 00: Glazing.

.6 Division 26: Electrical.

1.3 REFERENCES

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

.2 American Architectural Manufacturers Association (AAMA).
- .2 AAMA 609, Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.

.3 American Society for Testing and Materials International, (ASTM).
- .1 ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .2 ASTM B221, Standard Specification For Aluminum and Aluminum Alloy Extruded Bars Rods, Wire Profiles and Tubes.

.4 Canadian General Standards Board (CGSB).
- .1 CGSB 1.40, Primer, Structural Steel, Oil Alkyd Type.
- .2 CAN/CGSB-12.1, Tempered or Laminated Safety Glass.
- .3 CAN/CGSB-12.20, Structural Design of Glass for Buildings.

.5 Canadian Standards Association (CSA International).
- .1 CAN/CSA-G40.20/G40.21, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CAN/CSA G164, Hot Dip Galvanizing of Irregularly Shaped Articles.

1.4 SYSTEM DESCRIPTION

.1 Design Criteria.
- .1 Design frames and doors in exterior walls to:
  - .1 Accommodate expansion and contraction within service temperature range of -35 to 35 degrees C.

.1 (continued)

.1 (continued)

.2 Limit deflection of mullions to maximum 1/175th of clear span when tested to ASTM E330 under wind load of 1.2 kpa submit certificate of tests performed.

.3 Accommodate movement within system.

.4 Accommodate movement between system and perimeter framing components or substrate.

.2 Size glass thickness and glass unit dimensions to limits in accordance with CAN/CGSB-12.20.

.3 Provide continuous air barrier through door system. Primarily in line with inside pane of glass and heel bead of glazing compound.

.4 Standard of acceptance:

1. Exterior doors: wide stile with center rail, insulated.
   - .1 Kawneer 560 series (wide stile) Insulclad door;
   - .2 Alumicor Canadiana Series 600B (wide stile) Insuldoor;
   - .3 Prevost Series 2750 Insulated (wide stile) door;
   - .4 or approved equal.

2. Exterior door frames:
   - .1 Kawneer 1602, with door adapters;
   - .2 Alumicor Series 1750 Slimline, with door adapters;
   - .3 Prevost 3800 Narrow, with door adapters;
   - .4 or approved equal.

3. Interior doors: wide stile with center rail.
   - .1 Kawneer 500 series;
   - .2 Alumicor Series 600B;
   - .3 Prevost 2700, wide stile.
   - .4 or approved equal.

4. Interior door frames: flush glazed, center.
   - .1 Kawneer Trifab 450;
   - .2 Alumicor Series Flush Glaze TL1800;
   - .3 Prevost series 60.
   - .4 or approved equal.

1.5 **SUBMITTALS**

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

.2 Product Data: submit manufacturer's instructions, printed product literature and data sheets for doors and frames and include product characteristics, performance criteria, dimensions, methods of assembly, finish and limitations.

.3 Shop drawings:
- .1 Indicate materials and profiles and provide full-size, scaled details of components for each type of door and frame. Indicate:
  - .1 Interior trim and exterior junctions with adjacent construction.
  - .2 Junctions between combination units.
  - .3 Elevations of units.
  - .4 Core thicknesses of components.
  - .5 Type and location of exposed finishes, method of anchorage, number of anchors, supports, reinforcement, and accessories.
  - .6 Location of caulking.
  - .7 Each type of door system including location.
  - .8 Arrangement of hardware and required clearances.

.4 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion in the work.
- .3 Submit one 300 x 300 mm corner sample of each type door and frame.
- .4 Submit sample showing glazing detail, reinforcement, finish and location of manufacturer's nameplates.
- .5 Frame sample to show glazing stop, door stop, jointing detail, finish.

.5 Manufacturers' Field Reports: Submit two copies of manufacturers field reports.

1.6 **CLOSEOUT SUBMITTALS**

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

.2 Operation and Maintenance Data: submit operation and maintenance data for cleaning and maintenance of aluminum finishes for incorporation into manual.

1.7 **QUALITY ASSURANCE**

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

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

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

1.8 **DELIVERY, STORAGE, AND HANDLING**

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

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

.1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Use coatings that are easy to remove and residue free.

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

.3 Storage and Handling:

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

.2 Store and protect aluminum doors and frames from nicks, scratches and blemishes.

1.9 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction Waste Management and Disposal.

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

.3 Dispose of corrugated cardboard, polystyrene, plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

.4 Divert used metal cut-offs from landfill by disposal into the on-site metals recycling bin.

1.10 **WARRANTY**

.1 At no cost to Owner remedy any defects in work of this Section due to faults in materials and/or workmanship for a period of five (5) years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 **MATERIALS**

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

.2 Sheet aluminum: Aluminum Association alloy AA1100-(H14) or AA5005-(H32 or H34) anodizing quality.

.3 Steel reinforcement: to CAN/CSA-G40.20/G40.21, grade 300 W.

.4 Fasteners: aluminum, cadmium plated steel or stainless steel, finished to match adjacent material.

.5 Weatherstrip: replaceable wool pile with plastic fin.

.6 Door bumpers: black neoprene.

.7 Door bottom seal: door seal of anodized extruded aluminum frame and vinyl weather seal, surface mounted with drip cap.

.8 Isolation coating: bituminous paint or epoxy resin solution.

.9 Glass:
- .1 Interior doors and frames: tempered glass as described in Section 08 80 00 – Glazing.
- .2 Exterior doors and frames: insulating glass as described in Section 08 80 00 – Glazing.

.10 Glazing materials: EPDM elastomeric extrusions or thermoplastic elastomer.

.11 Sealants: colour selected by Departmental Representative in accordance with Section 07 92 00 – Joint Sealing.

2.2 **ALUMINUM DOORS**

.1 Construct doors of porthole extrusions with minimum wall thickness of 3 mm, glazing moldings 1.3 mm thick.

.2 Door stiles nominal 127 mm wide plus or minus 6 mm.

.3 Top rail nominal 127 mm wide plus or minus 6 mm.

.4 Bottom rail nominal 190 mm wide plus or minus 6mm.

.5 Centre rail nominal 210 mm wide plus or minus 6mm.

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

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

.8 Supply thermally broken doors and frame sections for exterior.

.9 Hardware: as specified and supplied under Section 08 71 00 – Door Hardware.

2.3 **ALUMINUM FRAMES**

.1 See System Description 1.4.

2.4 **ALUMINUM FINISHES**

.1 Finish exposed surfaces of aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
- .1 Clear anodized finish: AA-M10C22A42/A44 Architectural Class 1 # 14 on doors and frames.

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

2.5 **STEEL FINISHES**

.1 Finish steel clips and reinforcing steel with steel primer to CGSB 1.40 zinc coating to CSA G164.

2.6 **FABRICATION**

.1 Doors and framing to be by same manufacturer.

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

.3 Provide structural steel reinforcement as required.

.4 Fit joints tightly and secure mechanically.

.5 Conceal fastenings.

.6 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware using templates provided under Section 08 71 00 – Door Hardware.

.7 Reinforce interior horizontal head rail to receive automatic door operators.

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

.9 Visible manufacturer's identification labels not permitted.

PART 3 - EXECUTION

3.1 **EXAMINATION**

.1 Verification of Conditions: verify conditions of substrates previously installed under other Section are acceptable for aluminum doors and frames in accordance with manufacturer’s written instructions.
- .1 Visually review substrate with Departmental Representative.
- .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
- .3 Proceed with installation only after unacceptable conditions have been remedied and receipt of approval to proceed by Departmental Representative. continued

3.2 **INSTALLATION**

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

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

.3 Anchor securely.

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

.5 Adjust door components to ensure smooth operation.

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

.7 Glaze aluminum doors and frames in accordance with Section 08 80 00 – Glazing.

.8 Seal joints to provide weather tight seal at outside and air, vapour seal at inside.

.9 Apply sealants in accordance with Section 07 92 00 – Joint Sealing. Conceal sealant within the aluminum work except where exposed use is permitted by Departmental Representative.

3.3 **FIELD QUALITY CONTROL**

.1 Have manufacturer of products supplied under this Section review Work involved in handling, installation/application, protection and cleaning of its products, and submit written reports in acceptable format to verify compliance with this section.

.2 Manufacturer's field services: provide manufacturer's field services consisting of periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.4 **CLEANING**

.1 Progress Cleaning: clean in accordance with Section 01 74 11 – Cleaning.

- .1 Perform cleaning of aluminum components in accordance with AAMA 609.1 - Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.
- .2 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.
- .3 Clean aluminum with damp rag and approved non-abrasive cleaner.
- .4 Remove traces of primer, caulking, epoxy and filler materials; clean doors and frames.
- .5 Clean glass and glazing materials with approved non-abrasive cleaner.

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

3.5 **PROTECTION**

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

.2 Repair damage to adjacent materials caused by work of this Section.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED WORK

.1 Section 08 11 00: Steel Doors and Frames.

.2 Section 08 34 73: Sound Control Door Assemblies.

.3 Section 08 71 00: Door Hardware.

.4 Section 08 80 00: Glazing.

.5 Section 09 91 00: Painting.

.6 Section 12 24 13: Roller Window Shades.

1.3 REFERENCES

.1 Architectural Woodwork Standards, 2nd edition 2014, published Architectural Woodwork Manufacturers Association of Canada (AWMAC), Architectural Woodwork Institute (AWI) and Woodwork Institute (WI).

.2 Canadian Standards Association (CSA)
- .1 CSA O115-M1982(R2001), Hardwood and Decorative Plywood.
- .2 CSA O132.2 Series-90(R2003), Wood Flush Doors.
- .3 CAN/CSA-O132.5-M1992(R1998), Stile and Rail Wood Doors.

.3 Environmental Choice Program (ECP)
- .1 CCD-045-92, Sealants and Caulking Compounds.
- .2 CCD-046-92, Adhesives.

.4 National Fire Protection Association (NFPA)
- .1 NFPA 80-2007, Standard for Fire Doors and Fire Windows.
- .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.

.5 Underwriters' Laboratories of Canada (ULC)
- .1 CAN4-S104M-80(R1985), Fire Tests of Door Assemblies.
- .2 CAN4-S105M-85(R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.4 SUBMITTALS

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

.2 Shop Drawings:
- .1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Indicate door and frame elevations, anchor types and closure methods, finishes, locations of cutouts for hardware, and glazing.
- .3 Include schedule identifying each unit with door numbers relating to numbering on drawings and in door schedule.

.3 Samples:
- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit one 300 x 300 mm corner sample of each type of wood door.
- .3 Show door construction, core, glazing detail and faces.

.4 Manufacturer's Instruction:
- .1 Submit manufacturer's installation instructions.

.5 Certificates: Manufacturer's certification that doors comply with specified performance and physical properties.

1.5 **QUALITY ASSURANCE**

.1 Regulatory Requirements:
- .1 Wood fire rated doors: labeled and listed by an organization accredited by Standards Council of Canada.

.2 Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.

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

.4 Single Source Responsibility: Provide doors from a single source to ensure uniformity in quality and appearance, face veneer, finish and construction.

1.6 **DELIVERY, STORAGE AND HANDLING**

.1 Delivery:
- .1 Protect doors from dampness, humidity, heat, excessive dryness and direct sunlight. Arrange for delivery after work causing abnormal humidity has been completed.

.2 Storage:
- .1 Comply with door manufacturer's written recommendations and requirements of AWI Section 1300 G-23 and WDMA standards.
- .2 Maintain environmental conditions including temperature, humidity, and ventilation within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits. Inspect for damage prior to installation.

.3 Store doors in well ventilated room, off floor. Room must be clean, dry, free of dirt and water, and protected from the elements.

.4 Store products in manufacturer's unopened packaging until ready for installation. Inspect for damage.

.3 Protection:

.1 Protect doors from scratches, handling marks and other damage. Individually package doors in scuff and water resistant wrappings. Do not remove protective coverings from units until ready for installation.

.4 Handling:

.1 Label each door with manufacturer's name, product identification, door number, size, type and hardware set number.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction Waste Management & Disposal.

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

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

PART 2 - PRODUCTS

2.1 **FIRE RATED WOOD DOORS**

.1 Wood doors: tested in accordance with CAN4-S104 and NFPA 252 to achieve rating as indicated on architectural Door Schedule Drawings.

2.2 **WOOD FLUSH DOORS**

.1 Solid core wood doors: to CAN/CSA-O132.2.1, 45 mm thick, 5 - ply anti-warping construction, agrifibre core, with birch veneer faces, factory pre-machined for door hardware, and factory prefinished:

.1 Stiles: 22 mm hardwood, laminated to LVL, total width 107 mm, bonded to core.

.2 Edge: 3mm thick hardwood veneer, matched with faces, laminated to stiles with adhesive.

.3 Top and bottom rails: 3 mm thick hardwood veneer, laminated to LVL, total width 85 mm, bonded to core.

.4 Core: agrifibre core, neutral FSC (UFF), bonded to stiles.

.5 Faces: plain sliced (flat cut), 2 ply, uniform white, birch FSC wood veneer faces (UFF).

.6 Adhesive: type I, PVA cross-link (UFF).

.7 Finish: factory applied clear finish, satin gloss level.

.8 Acceptable product: # 8500-ME-AF Wood Doors by Baillargeon Doors Inc., equivalent PC-5 FSC wood door with "Smartwood" and closer and lock block reinforements by Algoma Hardwoods, Inc., equivalent Series 5 FS 8300 PME wood door by Lambton Doors, equivalent wood door by Mowhawk Finish Doors (a Masonite Company), or approved equal.

2.3 **ACOUSTIC WOOD DOORS**

.1 Sound control door and frames as specified in Section 08 34 73 – Sound Control Door Assemblies.

2.4 **GLAZING**

.1 As per requirements of Section 08 80 00 – Glazing.

2.5 **FABRICATION**

.1 Vertical edge strips to match face veneer.

.2 Prepare doors for glazing and louvres where indicated on Door Schedule. Provide hardwood (Birch) glazing stops, to match face veneer, with mitred corners.

.3 Bevel vertical edges of single acting doors 3 mm in 50 mm on lock side and 1.5 mm in 50 mm on hinge side.

.4 Pre-machine doors for finish hardware in accordance with templates supplied by Section 08 71 00 – Door Hardware. Include for extra reinforcing of concealed overhead stops, concealed door bottoms, exit devices and closers where required.

PART 3 - EXECUTION

3.1 **MANUFACTURER'S INSTRUCTIONS**

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

3.2 **EXAMINATION**

.1 Examine all applicable drawings to determine architectural details which will affect door installations. Examine completed work on which door installation is dependent.

.2 Do not begin installation until adjacent construction has been properly prepared.

3.3 **INSTALLATION**

.1 Unwrap and protect doors in accordance with CAN/CSA-0132.2 Series, Appendix A.

.2 Install labelled fire rated doors to NFPA 80.

.3 Install doors and finish hardware in accordance with door and hardware manufacturer's printed instructions and CAN/CSA-0132.2 Series, Appendix A.

.4 Adjust hardware for proper door function and latching, and for smooth operation without excessive force.

.3 Accurately fit doors into frames to ensure smooth operation without binding. Doors shall have 3 mm clearance at head and jambs and 12 mm over finished floor surfaces unless otherwise indicated.

.4 Install glazing in accordance with Section 08 80 00 - Glazing.

.5 Black-out window shades at glazed openings in resident bedroom doors installed by Section 12 24 13 – Roller Window Shades.

3.4 **ADJUSTMENT**

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

3.5 **CLEANING**

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

.2 Remove traces of primer, caulking; clean doors and frames.

.3 Clean glass and glazing materials with approved non-abrasive cleaner.

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

END OF SECTION

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 09 21 16 - Gypsum Board Assemblies.

.2 Section 23 33 00 - Duct Accessories.

.3 Section 22 42 01 - Plumbing Specialties and Accessories.

1.2 SHOP DRAWINGS

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

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

1.3 SAMPLES

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

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

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

1.4 CLOSEOUT SUBMITTALS

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

1.5 DELIVERY, STORAGE AND HANDLING

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

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

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

PART 2 - PRODUCTS

2.1 ACCESS DOORS

.1 Sizes: Except as indicated otherwise, to be minimum sizes as follows:
- .1 For body entry: 600 x 600 mm.
- .2 For hand entry: 300 x 300 mm.
- .3 Access doors to be sized large enough to serve intended purpose.

.2 Construction: galvanized steel, rounded safety corners, concealed hinges, keyed latch, anchor straps, able

to open 180. Provide fire-rated access doors where penetrating fire-rated construction.

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

2.2 EXCLUSIONS

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

PART 3 - EXECUTION

3.1 INSTALLATION

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

3.2 LOCATION

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

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

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

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

.5 Access to space above lay-in tile ceilings will be by removal of lay-in tiles.

.6 Doors to open greater than 90 degrees, have concealed hangers, anchor straps and must be lockable with removable cores.

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

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

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

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

.11 Access points in ductwork must be no more than 30 feet apart.

.12 Gasketted panels (patches) minimum size 12" x 12" and fabricated from the same material as the duct and fastened with sheet metal screws are permitted if the access is for cleaning only; otherwise access doors shall be provided.

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

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED WORK

.1 Section 08 11 00: Steel Doors and Frames.

.2 Section 08 14 00: Wood Doors.

.3 Section 08 71 00: Door Hardware.

.4 Section 08 80 00: Glazing.

.5 Section 09 91 00: Painting.

1.3 REFERENCES

.1 ANSI/WDMA I.S. 1A-2004 – Industry Standard for Architectural Flush Wood Doors.

.2 ASTM A480/A480M-06b – General Requirements for Flat-Rolled Stainless Heat Resisting Steel Plate, Sheet, and Strip.

.3 ASTM A653/A653M-06 – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Allow-Coated (Galvannealed) by the Hop Dip Process.

.4 ASTM E90-09 – Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.5 ASTM E413-10 – Classification for Rating Sound Insulation.

.6 CAN/CSA-B651-04(R2010) – Accessible Design for the Built Environment.

.7 Environmental Choice Program (ECP)
- .1 CCD-045-92, Sealants and Caulking Compounds.
- .2 CCD-046-92, Adhesives.

.8 HMMA 802-92 – Manufacturing of Hollow Metal Doors and Frames.

.9 HMMA 840-99 – Installation and Storage of Hollow Metal Doors and Frames.

.10 National Fire Protection Association (NFPA)
- .1 NFPA 80-2007, Standard for Fire Doors and Fire Windows.
- .2 NFPA 252-1999, Standard Method of Fire Tests of Door Assemblies.

.11 Underwriters' Laboratories of Canada (ULC)
- .1 CAN4-S104M-80(R1985), Fire Tests of Door Assemblies.
- .2 CAN4-S105M-85(R1992), Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.4 PERFORMANCE REQUIREMENTS

.1 Acoustic Performance: Minimum Sound Transmission Class (STC) as noted on Door Schedule drawings, tested to ASTM E90. Label indicating sound transmission class shall be applied to the door and door frame.

1.5 **REGULATORY REQUIREMENTS**

.1 Installed Door and Frame Assembly: Conform to NFPA 80 for fire rated class as scheduled. Label indicating fire resistance shall be applied to the door and door frame.

1.6 **SUBMITTALS**

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

.2 Product Data: Provide product data on door construction.

.3 Shop Drawings: Indicate door and frame elevations, anchor types and closure methods, finishes, locations of cutouts for hardware, and glazing.
.1 Include schedule identifying each unit with door numbers relating to numbering on drawings and in door schedule.

.4 Samples: Show manufacturer's door finish sample, door corner construction, and perimeter acoustic gasket.

.5 Test Data:
.1 Submit test data indicating compliance with Sound Transmission Class requirements. Include laboratory name, test report number and date of test.

.6 Installation Instruction: Submit manufacturer's installation instructions.

1.6 **QUALITY ASSURANCE**

.1 Perform work to requirements of Canadian Steel Door Manufacturers Association.

1.8 **DELIVERY, STORAGE AND HANDLING**

.1 Transport, handle, store and protect products as per requirements of Section 01 61 00 – Common Product Requirements.

.2 Weld minimum two temporary jamb spreaders per frame prior to shipment.

.3 Remove frames from wrappings or coverings upon receipt on site and inspect for damage. Leave doors covered for protection until hung.

.4 Store frames in vertical position, doors in horizontal position, spaced with blocking to permit air circulation between components.

.5 Store materials out of water and covered to protect from damage. Use covering that allows air circulation and does not permit light to penetrate.

.6 Store doors between 10º to 30ºC and 25 to 55 % relative humidity.

.7 Clean and touch up scratches or disfigurement to metal surfaces on frames or wood surfaces on doors.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction Waste Management & Disposal.

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

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

1.10 **WARRANTY**

.1 At no cost to Owner remedy any defects in work of this Section due to faults in materials and/or workmanship for a period of five (5) years from date of Substantial Performance.

.2 Submit warranty document as per requirements of Section 01 78 00 – Closeout Submittals.

PART 2 - PRODUCTS

2.1 **MATERIALS**

.1 Sheet Steel:
- .1 Galvanized steel to ASTM A653/A653M, ZF180.
- .2 Reinforcement channel: to CSA G40.20/G40.21, coating designation to ASTM A653/A653M, ZF75.

.2 Wood Door Panel:
- .1 Door Facing: Wood face veneer: birch species, minimum thickness before sanding 6 mm.
- .2 Door Edging: Where door face is wood veneer, door edges supplied with matching stiles and rails.

2.2 **ACCESSORIES**

.1 Hinges: Heavy weight butt type as per Section 08 71 00 – Door Hardware.

.2 Glazing stops for steel frames: Formed galvanized steel channel, butted corners, prepared for countersink screws for side lite.

.3 Glazing stop for wood doors: Formed stainless blade stops, mitred corners, prepared for countersink screws.

.4 Glass: Type tested to achieve STC and fire ratings. Glazing to be factory supplied and pre-installed.

.5 Primer: Rust inhibitive zinc chromate on frames.

.6 Threshold: To provide a seal for door in closed position.
- .1 Threshold height and configuration to comply with CAN/CSA-B651-12 requirements for barrier-free access.

.2 Perimeter and bottom acoustic seals: to provide acoustic seal for door in closed position.

2.3 **FABRICATION**

.1 Manufacturer acoustic doors and frames to STC ratings of 47, and 50, as measured in accordance with ASTM E90.

.2 Wood Doors:
- .1 Fabricate doors to ANSI/WDMA IS1A. Provide suitable thickness, design and core to achieve specified STC and fire performance ratings.
- .2 Reinforce doors where surface-mounted hardware is required.
- .3 Drill and tap for mortised, template hardware.

.4 Steel Frames:
- .1 Sheet steel, metal thickness and appropriate to maintain door STC and fire ratings, mitred corners, fully welded seams.
- .2 Factory assemble and weld frames.

.5 Factory install glazing appropriate to meet scheduled STC ratings.

.6 Affix permanent metal nameplates to door and frame indicating manufacturer's name and STC rating.

2.4 **FINISHES**

.1 Steel Frame Finish: factory applied zinc chromate primer. Finished on site by Section 09 91 00 – Painting.

.2 Factory Door Finish: Catalyzed polyurethane finish to WDMA I.S. 1A. Clear coat only, satin gloss level.

.3 Top and bottom rails: factory sealed with wood sealer.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 EXAMINATION

.1 Examine drawings and completed work on which door/frame installation is dependent.

.2 Do not begin installation until adjacent construction has been properly prepared.

3.3 INSTALLATION

.1 Install components to manufacturer's written instructions.

.2 Install wood doors to ANSI/WDMA I.S. 1A standards and in accordance with NFPA 80, and local authority having jurisdiction.

.3 Install steel frames to HMMA 840 standards and in accordance with NFPA 80 and local authority having jurisdiction.

.4 Coordinate with adjacent wall and partition construction for anchor placement.

.5 Set frames plumb, square, level and at correct elevation. Take into account clearance at door threshold.

.6 Allow for deflection to ensure that structural loads are not transmitted to frame.

.7 Adjust operable parts for correct clearances and function.

.8 Install and adjust perimeter and bottom acoustic seals. Ensure bottom seal makes full and positive contact with threshold.

.9 Finish paint in accordance with Section 09 91 00 – Painting.

3.4 ERECTION TOLERANCES

.1 Installation tolerances of installed frame for squareness, alignment, twist and plumbness to be no more than 1.5 mm (1/16") in compliance with HMMA 841.

3.5 **CLEANING**

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

.2 Remove traces of primer, caulking; clean doors and frames.

.3 Clean glass and glazing materials with approved non-abrasive cleaner.

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

3.6 **SCHEDULE**

.1 Install sound control doors and door assemblies, to STC ratings, and in locations as indicated on Door Schedule drawings.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED SECTIONS

.1 Section 07 27 26: Fluid Applied Membrane Air Barriers.

.2 Section 07 84 00: Firestopping and Smoke Seals.

.3 Section 07 92 00: Joint Sealing.

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

.5 Section 08 80 00: Glazing.

.6 Section 08 91 00: Louvers.

1.3 REFERENCES

.1 Aluminum Association (AA)
- .1 AA DAF 45-03(R200), Designation System For Aluminum Finishes.

.2 American Architectural Manufacturers Association (AAMA).
- .1 AAMA CW-DG-1-96, Aluminum Curtain Wall Design Guide Manual.
- .2 AAMA CW-10-97, Care and Handling of Architectural Aluminum From Shop to Site.
- .3 AAMA 501-05, Methods of Test for Exterior Walls.
- .4 AAMA 503-14, Voluntary Specification for Field Testing of Metal Storefronts, Curtain Wall and Sloped Glazing Systems.
- .5 AAMA 611-14, Voluntary Specifications for Anodized Finishes Architectural Aluminum.

.3 American Society for Testing and Materials International, (ASTM).
- .1 ASTM A36/A36M-08, Specification for Carbon Structural Steel.
- .2 ASTM A123/A123M-09, Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- .3 ASTM B209-07, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .4 ASTM B221-08, Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- .5 ASTM E283-04, Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .6 ASTM E330-02, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights, and Curtain Walls, by Uniform Static Air Pressure Difference.
- .7 ASTM E331-00(2009), Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform Static Air Pressure Difference.

.8 ASTM E1105-00(2008), 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.

.4 Canadian General Standards Board (CGSB).
.1 CAN/CGSB 1.108, Bituminous Solvent Type Paint.

.5 Canadian Standards Association (CSA International).
.1 CSA-G40.20/G40.21-04(R2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels.
.2 CSA-S136-07, North American Specification for the Design of Cold-Formed Steel Structural Members.
.3 CAN3-S157, Strength Design in Aluminum.
.4 CSA W59.2-M1991(R2008), Welded Aluminum Construction.

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

.7 Society for Protective Coatings (SSPC).
.1 SSPC - Paint 20 Zinc Rich Coating.
.2 SSPC - Paint 25 Alkyd, Zinc Oxide Linseed Oil and Primer for Use Over Hand Cleaned Steel Type 1 and Type 2.

1.3 **SUBMITTALS**

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

.2 Product data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for curtain wall components, anchorage and fasteners, glass and infill, and internal drainage details. Include product characteristics, performance criteria, dimensions, finish and limitations.

.3 Shop drawings:
.1 Submit shop drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia.
.2 Indicate system dimensions, profiles of components, materials, details to scale, including head, jamb and sill conditions, elevations, opening vents and hardware, framed opening requirements and tolerances. Show adjacent construction and anchorage details, anticipated deflection under load; internal weep drainage network; expansion and contraction joint location and details, and field welding required.

.4 Samples:
.1 Submit for review and acceptance of each unit.
.2 Samples will be returned for inclusion in the work.
.3 Submit two samples 300 x 300 mm in size illustrating prefinished aluminum surface, finish, colour, texture, specified glass units, insulated infill panels, glazing materials illustrating edge and corner.

.5 Delegated Design Submittals: Include framing member structural and physical characteristics, calculations, dimensional limitations, special installation requirements.

Test Reports: Submit substantiating engineering data, test results of previous tests by independent laboratory which purport to meet performance criteria, and supportive data.

1.4 **QUALITY ASSURANCE**

.3 Regulatory Requirements: conform to applicable code for acoustic attenuation, sound transmission requirements.

.4 Mock-ups:
- .1 Construct mock-ups in accordance with Section 01 45 00 – Testing and Quality Control.
- .2 Provide mock-up of curtain wall assembly including intermediate mullion, corner mullion, sill muntin, vision glass light, and insulated infill panel and glass.
  - .1 Assemble to illustrate component assembly including glazing materials, weep drainage system, attachments, anchors, and perimeter sealant.
- .3 Locate mock-up where directed by Departmental Representative.
- .4 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with work.
- .5 When accepted, mock-up will demonstrate minimum standard for this work.
- .6 Mock-up may remain as part of finished work.

.3 Pre-Installation Meeting:
- .1 Conduct pre-installation meeting to verify project requirements and manufacturer's installation instructions.
- .2 Convene minimum one week before starting work of this Section.

1.5 **DELIVERY, STORAGE, AND HANDLING**

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

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

.3 Storage and Handling:
- .1 Handle work of this section in accordance with AAMA CW-10.
- .2 Store materials off ground, indoors in dry location and in accordance with manufacturer’s recommendations in clear, dry well-ventilated area.
- .3 Store and protect aluminum doors and frames from nicks, scratches and blemishes.
- .4 Protect prefinished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather.
- .5 Replace defective or damaged materials with new.

1.6 **AMBIENT CONDITIONS**

.1 Install sealants when ambient temperature is above 5 degrees C. minimum.

.2 Maintain this minimum temperature during and for 48 hours minimum after installation of sealants.

1.7 **COORDINATION**

.1 Coordinate work of this section with installation of fire stopping, air barrier placement, vapour retarder placement, flashing placement, and components or materials.

1.8 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 – Construction Waste Management and Disposal.

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

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

.4 Divert unused metal from landfill to metal recycling facility as approved by Departmental Representative.

.5 Dispose of unused sealant and adhesive material at official hazardous material collections site approved by Departmental Representative.

.6 Fold up metal banding, flatten and place in designated area for recycling.

1.9 **WARRANTY**

.1 At no extra cost to contract remedy any defects in work of this Section due to faults in materials and/or workmanship for a period of five (5) years from date of Substantial Performance.

.2 Glazed aluminum curtain walls and operable vents shall stay in place and remain leakproof for a period of five (5) years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

.1 Description:

.1 Vertical glazed aluminum curtain wall system includes thermally broken tubular aluminum sections with self-supporting framing, shop fabricated, factory prefinished, vision glass, insulated glass spandrel infill panels, column covers; related flashings, anchorage and attachment devices.

.2 Assembled system to permit re-glazing of individual glass (and infill panel) units from exterior without requiring removal of structural mullion sections.

.2 Performance Requirements:

.1 Design and size components to withstand dead and live loads caused by pressure and suction of wind, snow and hail for sloped glazing, acting normal to plane of system as calculated in accordance with National Building Code 2010 to a design pressure of 1.10kPa (23psf) as measured in accordance with ASTM E330.

.2 Design and size components to withstand seismic loads and sway displacement as calculated in accordance with National Building Code 2010.

.3 Limit mullion deflection to L/175; with full recovery of glazing materials.

.4 Size glass units and glass dimensions to limits established in CAN/CGSB-12.20.

.5 Provide system to accommodate, without damage to components or deterioration of seals:

.1 Movement within system.

.2 Movement between system and perimeter framing components.

.3 Dynamic loading and release of loads.

.4 Deflection of structural support framing.

.5 Shortening of building concrete structural columns.

.6 Creep of concrete structural members.

.7 A mid-span slab edge deflection of 19 mm.

.6 Thermal Resistance of:

.1 System (overall): RSI of 0.44.

.2 Vision glass areas: RSI of 0.8.

.7 Sound attenuation through wall system (exterior to interior): STC 31 ASTM E413.

.8 Limit air infiltration through assembly to 0.0003m3/s/m2 of wall area, measured at a reference differential pressure across assembly of 75 Pa as measured in accordance with ASTM E283.

.9 Vapour seal with interior atmospheric pressure of 25 mm sp, 22 degrees C, 40% RH: No failure.

.10 Water leakage: none, when measured in accordance with ASTM E331.

.11 System to provide for expansion and contraction within system components caused by a cycling temperature range of 95 degrees C over a 12 hour period without causing detrimental affect to system components.

.12 Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

.13 Maintain continuous air barrier and vapour retarder throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.

.14 Ensure no 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 occur.

2.2 **MATERIALS**

.1 Extruded aluminum: ASTM B221.

.2 Sheet aluminum: ASTM B209.

.3 Sheet steel: CSA-S136M and ASTM A653/A653M; galvanized.

.4 Steel sections: CSA-G40.20/G40.21M and ASTM A36/A36M; shaped to suit mullion sections.

.5 Anchors: 3-way adjustable hot-dip galvanized cast iron.

.6 Fasteners: stainless, finish to match curtain wall.

.7 Isolation coating: alkali resistant bituminous paint to CAN/CGSB 1.108, Type 1, without thinner.

.8 Glazing: See Section 08 80 00 – Glazing and schedules for types and locations.

.9 Fire Safety Materials: See Section 07 84 00 – Firestopping and Smoke Seals.

.10 Curtain wall spandrel panel insulation: Section Section 07 21 00 – Building Insulation.

.11 Sealant: See Section 07 92 00 – Joint Sealing.

2.2 **COMPONENTS**

.1 Mullion profile:
- .1 Vertical members: 63.5 x 190 mm nominal dimension (overall with 19 mm cap).
- .2 Horizontal members: 63.5 x 190 mm nominal dimension.
- .3 Thermally broken with interior tubular section insulated from exterior pressure plate.
- .4 Matching stops and pressure plate of sufficient size and strength to provide adequate bite on glass and infill panels.
- .5 Face caps: 19mm (or capless structural silicone glazing as shown on drawings).
- .6 Drainage holes, deflector plates and internal flashings to accommodate internal weep drainage system.
- .7 Reinforced mullion: internal reinforcement of shaped steel structural section as required for maximum design deflection.
- .8 Provide manufacturer's engineered approval for application.
- .9 Acceptable product: Kawneer 1600 (2), Alumicor Series 2500, or approved equal.

.2 Spandrel panel: internally reinforced, glazing edge sealed preventing internal air movement to glazing space, inside air barrier line:
- .1 Outer face: 6 mm thick glass.
- .2 Core: glass fibre insulation core with RSI of 0.67per 25 mm.
- .3 Inner face: 1.5 mm thick aluminum.

.3 Closures, covers and trim: 2 mm thick aluminum, finish to match curtain wall mullion sections where exposed, secured with concealed fastening method.

.4 Exterior Sills: formed aluminum of type and size as detailed to suit job conditions; minimum 2.5 mm thick, complete with joint covers, and jamb drip deflectors, clear anodic finish: designation AA-M12 C22 A41 Class1.

.5 Operable sash: to CAN/CSA – A440, extruded aluminum, thermally broken with insulating glass. Acceptable Product: Kawneer 526 Isoport, Alumicor Series 1350, or approved equal.
- .1 Types (see Building Elevation drawings and Window Type Drawings for locations and sizes):
  - .1 Open-out top-hinged vent.
  - .2 Casement.
- .2 Glass reinforced nylon 6/6 thermal break.
- .3 Tubular extrusions, short leg for curtainwall installation.
- .4 Mitred, clip, adhesive, stake joinery (factory fabricated).
- .5 Full rain screen drainage.
- .6 25 mm sealed glazed units, replaceable from interior.
- .7 Exterior pre-shim rubber gaskets/ interior EPDM rubber gaskets.
- .8 Lock-in glass stop.
- .9 Insect screens to CGSB 79-GP-1M
  - .1 Type: 1.
  - .2 Class: C.
  - .3 Style: 2.
  - .4 Insect screening mesh: count 18 x 16, aluminum.
  - .5 Colour: Black.
  - .6 Fasteners: tamper proof.
  - .7 Screen frames: colour to match window frames.
  - .8 Mount screen frames for interior replacement.

.6 Air Barrier and Flexible Membrane Flashing: modified bitumen, pressure sensitive compound, self-adhering type, reinforced with polyethylene or glass scrim, nominal total thickness of 40 mils (1 mm). Primer and lap sealant as recommended by manufacturer. Acceptable manufacturer:
- .1 Perm-A-Barrier by W.R. Grace & Co. of Canada Ltd.
- .2 Blueskin SA by Monsey Bakor, Inc.
- .3 Sopraseal Stick by Soprema Inc.
- .4 Aquabarrier AVB by IKO Industries Ltd.
- .5 or approved equal.

2.3 **FABRICATION**

.1 Fabricate system components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.

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

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

.4 Size units to allow for structural deflection of surrounding construction.

.5 Design work so that it will not be distorted, nor fasteners overstressed, from expansion and contraction of metal.

.6 Window vents: operable vents, bottom hinged opening in as shown on drawings. Mount all vents into framing in factory, complete with all hardware and maintain in locked position until glazed. Limit maximum opening of vents to 150 mm. Finish of hardware to match window frame finish.

.7 Make provisions to drain to exterior any moisture entering or forming inside systems while preventing passage of air, dirt or insects to the interior.

.8 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof. Deburr and make smooth all sharp edges and corners.

.9 Prepare components to receive anchor devices. Install anchors.

.10 Arrange fasteners and attachments to ensure concealment from view.

.11 Prepare system components to receive exterior doors and hardware.

.12 Reinforce interior horizontal head rail to receive automatic door operators, drapery track brackets and attachments.

.13 Reinforce framing members for external imposed loads.

.14 Visible manufacturer's identification labels not permitted.

2.4 **FABRICATION: INFILL PANELS**

.1 Fabricate infill panels with metal covered edge seals around perimeter of panel assembly, enabling installation and minor movement of perimeter seal.

.2 Reinforce interior surface of exterior panel sheet from deflection caused by wind and suction loads.

.3 Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

.4 Place insulation within panel, adhered to exterior face of interior panel sheet over entire area of sheet with impale fasteners in accordance with Section 07 21 00 – Building Insulation.

.5 Ventilate and pressure equalize the air space outside the exterior surface of the insulation, to the exterior.

.6 Arrange fasteners and attachments to ensure concealment from view.

.7 Reinforce panel to receive convector cabinet brackets and attachments.

2.5 **FINISHES**

.1 Finish exposed surfaces of aluminum windows and aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.

.1 Clear anodized finish: designation AA-M10C22A41, Architectural Class 1, with a minimum coating thickness of 0.7 mils.

.2 Formed components such as sills, closures, trim shall be formed prior to finishing.

.3 Shop and touch-up primer for steel components: SSPC 25 Paint red oxide.

.4 Touch-up primer for galvanized steel surfaces: SSPC 20 Paint zinc rich.

.5 Concealed steel items: primed with iron oxide paint.

.6 Apply one coat of bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar materials.

2.6 **ISOLATION COATING**

.1 Isolate aluminum from following components, by means of isolation coating:

.1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.

.2 Concrete, mortar and masonry.

.3 Wood.

2.7 **SOURCE QUALITY CONTROL**

.1 Perform work in accordance with AAMA GSM and AAMA CW-I-9. Maintain one copy on site.

.2 Design structural support framing components to CAN3 S157 under direct supervision of a professional structural engineer experienced in design of this Work of the type described in this Section and registered or licensed to practice in the Province of New Brunswick.

.3 Perform welding Work in accordance with CSA W59.2.

PART 3 - EXECUTION

3.1 **EXAMINATION**

.1 Verification of Conditions: verify conditions of substrates previously installed under other Section are acceptable for curtain wall installation in accordance with manufacturer's written instructions.

.1 Visually review substrate in presence of Departmental Representative.

.2 Verify dimensions, tolerances, and method of attachment with other work.

.3 Verify wall openings and adjoining air barrier and vapour retarder materials are ready to receive work of this Section.

.4 Inform Departmental Representative of unacceptable conditions immediately upon discovery.

.5 Proceed with installation only after unacceptable conditions have been remedied.

3.2 **INSTALLATION**

.1 Install curtain wall and sloped glazing system in accordance with manufacturer's instructions.

.2 Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

.3 Provide alignment attachments and shims to permanently fasten system to building structure. Clean weld surfaces; apply protective primer to field welds and adjacent surfaces.

.4 Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances and align with adjacent work.

.5 Provide thermal isolation where components penetrate or disrupt building insulation.

.6 Install sill flashings and formed aluminum sills where indicated.

.7 Install eave edge flashings at sloped glazing system.

.8 Coordinate installation of fire stop insulation at each floor slab edge and intersection with vertical construction where indicated.

.9 Co-ordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.10 Fill voids in shim spaces and voids between perimeter of assembly framing and surrounding building elements with non-expanding type foamed-in-place insulation to maintain continuity of thermal barrier.

.11 Install fire-stopping in areas as indicated.

.12 Install operating sash in accordance with manufacturer's recommendations, to glazing method required to achieve performance criteria.

.13 Install glass and infill panels in accordance with Section 08 80 50 - Glazing, to exterior wet/dry method of glazing. Place sealant on the up-slope side of the pressure plate cover caps; finish the surface with a slope to encourage drainage over the cap. Cover caps to conceal screws and provide continuous sightline.

.14 Install perimeter sealant to method required to achieve performance criteria, backing materials, and installation criteria in accordance with Section 07 92 00 - Joint Sealing.

.15 Install louvers in curtain wall window assembly, associated flashings, blank-off panels and screening. Fit blank off panels tight to ductwork.

3.3 **SILL INSTALLATION**

.1 Where indicated apply flexible membrane flashing and effectively seal all joints and to adjacent building elements.

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

.3 Cut sills to fit window opening.

.4 Secure sills in place with anchoring devices located at ends and evenly spaced 600 mm o.c. in between.

.5 Fasten sill expansion joint covers with self tapping stainless steel screws.

.6 For sills over 2000 mm in length, maintain 3 to 6 mm space at each end.

3.4 **SEALANTS**

.1 Apply sealant in accordance with Section 07 92 00 – Joint Sealing.

.2 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window frame. Caulk butt joints in continuous sills.

.3 Clean and prime contact surfaces in accordance with manufacturers recommendations prior to installation of sealant.

.4 Provide caulking between framing members and adjoining work and where required to render work of this Section weather tight.

.5 Effectively seal window units to adjacent building elements to provide for continuity of air and vapour barrier in all locations.

.6 Fill voids between framing and surrounding building elements with foamed-in-place insulation.

.7 Match colour of sealant to colour of window frame.

3.5 **SITE TOLERANCES**

.1 Maximum variation from plumb: 1.5 mm/m non-cumulative or 12 mm/30 m, whichever is less.

.2 Maximum misalignment of two adjoining members abutting in plane: 0.8 mm.

.3 Maximum sealant space between curtain wall and adjacent construction: 13 mm.

3.6 **FIELD QUALITY CONTROL**

.1 Inspection will monitor quality of installation and glazing.

.2 Test to ASTM E1105, and AAMA 501.

.3 Evaluate installed system by thermo-photographic scan.

3.7 **ADJUSTING**

.1 Adjust operating sash for smooth operation.

3.8 **CLEANING**

.1 Remove protective material from prefinished aluminum surfaces.

.2 Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.3 Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

3.9 **PROTECTION**

.1 Protect finished Work from damage.

END OF SECTION

PART 1 - GENERAL

1.1 RELATED REQUIREMENTS

.1 Section 07 46 19: Preformed Metal Wall Cladding.

.2 Section 07 62 00: Sheet Metal Flashing and Trim.

.3 Section 07 92 00: Joint Sealing.

.4 Section 08 80 00: Glazing.

1.2 REFERENCES

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

.2 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-79.1-M91, Insect Screens.

.3 CSA International
- .1 CSA-A440-00/A440.1-00(R2005),A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
- .2 CAN/CSA-A440.2-09, Fenestration Energy Performance.
- .3 CAN/CSA-Z91-02(R2008), Health and Safety Code for Suspended Equipment Operations.

1.3 ACTION AND INFORMATION SUBMITTALS

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

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

.3 Shop Drawings:
- .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Nova Scotia, Canada.
- .2 Indicate materials and details in full size scale for head, jamb and sill, profiles of components, interior and exterior trim, junction between combination units, elevations of unit, anchorage details, location of isolation coating, description of related components and exposed finishes fasteners, and caulking. Indicate location of manufacturer's nameplates.

.4 Samples:
- .1 Submit for review and acceptance of each unit.
- .2 Samples will be returned for inclusion into work.
- .3 Submit one representative model complete full size window sample of each type window.
- .4 Include frame, sash, sill, glazing and weatherproofing method, surface finish and colour. Show location of manufacturer's nameplates.

.4 (continued)

.5 Include 150 mm long samples of head, jamb, sill, meeting rail mullions to indicate profile.

.5 Test and Evaluation Reports:

.1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:

.1 Windows classifications.
.2 Anodized finish, weathering characteristics.
.3 Air tightness.
.4 Water tightness.
.5 Wind load resistance.
.6 Condensation resistance.
.7 Sash strength and stiffness - operable casement projecting.
.8 Ease of operation - windows with operable lights.
.9 Forced entry resistance.
.10 Mullion deflection - combination and composite windows.

1.4 CLOSEOUT SUBMITTALS

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

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

1.5 QUALITY ASSURANCE

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

.2 Qualifications:

.1 Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
.2 Installer: experienced in performing work of this Section and approved by window manufacturer.

.3 Mock ups:

.1 Construct mock ups in accordance with Section 01 45 00 - Quality Control.
.2 Construct mock up panel of exterior wall assembly 1800 x 1800 mm incorporating window.
.3 Mock-up will be used:

.1 To judge workmanship, substrate preparation, operation of equipment and material application.
.2 For testing to determine compliance with performance requirements.

.4 Construct mock up where directed by the Departmental Representative.

.5 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with Work of this Section.

.6 When accepted by Departmental Representative, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.6 **DELIVERY, STORAGE AND HANDLING**

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

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

.3 Storage and Handling Requirements:
- .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Store and protect windows from nicks, scratches, and blemishes.
- .3 Replace defective or damaged materials with new.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 22 - Construction / Demolition Waste Management and Disposal.

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

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

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Fold up metal banding, flatten and place in designated are for recycling.

1.7 **WARRANTY**

.1 At no cost to Departmental Representative remedy any defects in work of this section due to faults in materials and/or workmanship for a period of five (5) years from date of Substantial Performance.

.2 At no cost to Departmental Representative replace any window unit whose finish shows any defects such as delamination, blisters or excessive fading within five (5) years of Substantial Performance.

PART 2 - PRODUCTS

2.1 **SYSTEMS**

.1 Window frame: fixed type, to CAN/CSA-A440, extruded aluminum, thermally broken with triple glazed sealed insulated glass with 50 mm exterior nose and 89 mm back section. Acceptable products:
- .1 Series 518 “Isoport” (125 mm deep perimeter frame and mullions) windows by Kawneer Company Canada Ltd.
- .2 Series 970 (125 mm deep perimeter frame and mullions) by Alumicor Limited.

.1 (continued)

.3 Series 20-500 (130 mm deep perimeter frame and mullions) Insulated Window Framing System by Prevost.

.2 All aluminum windows by same manufacturer.

2.2 **WINDOW TYPE AND CLASSIFICATION**

.1 Type: Fixed, with sealed triple-glazed insulating unit.
- .1 Classification rating: to CAN/CSA-A440:
- .2 Air tightness: A3
- .3 Water tightness: B4
- .4 Wind load resistance: C3
- .5 Condensation resistance: Temperature Index, I-51
- .6 Forced Entry: F2
- .7 Glazing: G2
- .8 Side hinged, swing-out glazed casement units where indicated on architectural drawings.
- .9 Limiter on vent operator to restrict unit opening to no more than 125 mm.

2.3 **MATERIALS**

.1 Framing Components:
- .1 Aluminum extrusions: AA 6063-T6 alloy, minimum 1.6 mm thick.
- .2 Aluminum plate and sheet: AA 1100 alloy.
- .3 Screws, bolts, nuts, washers, rivets and other fasteners incorporated into aluminum sections: aluminum or ANSI Series 300 stainless steel, or hot dip galvanized steel.
- .4 Anchoring devices: aluminum, non-magnetic stainless steel or hot dip galvanized steel.

.2 Glass and glazing materials: Triple-glazed, sealed insulating glass as specified in Section 08 80 00 - Glazing.

.3 Infill panel: internally reinforced, glazed edge sealed preventing air movement to glazing space inside air barrier line:
- .1 Outer face: 6 mm. thick float glass, coloured.
- .2 Core: glass fibre insulation core with RSI of 0.67 per 25mm. thickness.
- .3 Inner face: 1.5mm. thick aluminum.

.4 Caulking and sealants: as specified in Section 07 92 00 – Joint Sealing. VOC limit 250 G/L maximum to SCAQMD rule 1168.

.5 Isolation coating: alkali resistant bituminous paint.

.6 Exterior sills: extruded aluminum of type and size as detailed to suit job conditions; minimum 2.5 mm thick, complete with joint covers, jamb drip deflectors, chairs, anchors, and extruded aluminum end caps. Colour to match windows.

2.4 **FABRICATION**

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

.2 Window framing shall consist of thermally broken tubular sections with planted stop on exterior side, and snap-in glass stops on interior side. Use either closed tubular mullion sections at window frame perimeter locations or fill perimeter frame with rigid insulation.

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

.4 Face dimensions detailed are maximum permissible sizes.

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

.6 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40 380 g/m2 zinc coating to ASTM A/123/A123M.

.7 Aluminum components shall be extruded sections and shapes unless otherwise specified.

.8 Size units to allow for structural deflection of surrounding construction.

.9 Design work so that it will not be distorted, nor fasteners overstressed, from expansion and contraction of metal.

.10 Fastenings shall be concealed.

.11 Assemble all joints in main window frame and sash, neatly, in weathertight manner and secure by means of screws anchored into integral screw ports. Mechanically joined sections shall have hairline joints. Deburr and make smooth all sharp edges and corners. Fabricate entire window in a manner that will allow easy replacement of any defective, damaged or worn components, hardware or weather-stripping.

.12 Removable glazing stops shall be fabricated in sections not exceeding length of the pane of glass being restrained.

.13 Double weather-strip window units at all sash perimeters. Install all weather-stripping in specially extruded ports and secure to prevent shrinkage or movement.

.14 Make provisions to drain to exterior any moisture entering or forming inside systems while preventing passage of air, dirt or insects to the interior.

.15 Closures, covers and trim shall be extruded or formed to profiles shown and unless otherwise shown, minimum 2 mm thick.

2.5 **ALUMINUM FINISHES**

.1 Finish exposed surfaces of aluminum windows and aluminum components in accordance with Aluminum Association Designation System for Aluminum Finishes.
  .1 "Dark bronze" anodized finish designation AA-M10C22A44, Architectural Class 1, with a minimum coating thickness of 0.7 mils.

.2 Formed components such as sills, closures, trim shall be formed prior to finishing.

2.6 **ISOLATION COATING**

.1 Primers Paints Coatings: in accordance with manufacturer's recommendations for surface conditions.
  .1 Primer: VOC limit 100 g/L maximum to GS-11
  .2 Coating: VOC limit 100 250 275 g/L maximum to GS-11
  .3 Paint: VOC limit 50 150 g/L maximum to GS-11

.2 Isolate aluminum from following components, by means of isolation coating:
  .1 Dissimilar metals except stainless steel, zinc, or white bronze of small area.
  .2 Concrete, mortar and masonry.
  .3 Wood.

2.7 **GLAZING**

.1 Glaze windows in accordance with CSA-A440 / A440.1.

.2 Triple glazed insulating unit: as described in Section 08 80 00 Glazing.

.3 Glazing to be site installed, removable.

2.8 **AIR BARRIER AND VAPOUR RETARDER**

.1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:
  .1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
  .2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

PART 3 - EXECUTION

3.1 **EXAMINATION**

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
  .1 Visually inspect substrate in presence of Departmental Representative.
  .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
  .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 **INSTALLATION**

.1 Window installation:
- .1 Install in accordance with CSA-A440/A440.1.
- .2 Arrange components to prevent abrupt variation in colour.

.2 Sill installation:
- .1 Install aluminum sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece mm lengths at each location.
- .2 Cut sills to fit 12mm longer than window opening.
- .3 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm on centre in between.
- .4 Fasten expansion joint cover plates and drip deflectors with self-tapping stainless steel screws.
- .5 Maintain 6 to 9 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3 to 6 mm space at each end.

.3 Caulking:
- .1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
- .2 Apply sealant in accordance with Section 07 92 00 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 **ACCEPTANCE**

.1 Manufacturer to replace any glazed units broken, chipped or otherwise damaged during transport to site.

.2 Replacement units to be to same specification as that for original, damaged units.

3.4 **CLEANING**

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

3.5 **PROTECTION**

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

.2 Repair damage to adjacent materials caused by window installation.

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Comply with requirements of Division 1.

1.2 RELATED REQUIREMENTS

.1 Section 07 46 19: Preformed Metal Wall Cladding.

.2 Section 07 46 23: Wood Siding.

.3 Section 07 62 00: Sheet Metal Flashing and Trim.

.4 Section 07 92 00: Joint Sealing.

.5 Section 08 80 00: Glazing.

1.3 REFERENCES

.1 American Architectural Manufacturers Association (AAMA)
- .1 AAMA 303, Certification Procedural Guide.
- .2 AAMA 305, Voluntary Specification for Fiberglass Reinforced Thermoset Profiles.
- .3 AAMA 1503, Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.

.2 American National Standards Institute (ANSI)
- .1 ANSI Z97.1, Safety Performance Specifications and Methods of Test for Safety Glazing Materials Used in Buildings.

.3 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-1.40-97, Anticorrosive Structural Steel Alkyd Primer.
- .2 CAN/CGSB-79.1-M91, Insect Screens.

.4 CSA International
- .1 CSA-A440-00/A440.1-00(R2005),A440-00, Windows / Special Publication A440.1-00, User Selection Guide to CSA Standard A440-00, Windows.
- .2 CAN/CSA-A440.2-09, Fenestration Energy Performance.
- .3 CAN/CSA-Z91-02(R2008), Health and Safety Code for Suspended Equipment Operations.

1.4 ACTION AND INFORMATION SUBMITTALS

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

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

.3 Shop Drawings:
- .1 Submit drawings in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Include elevations, sections, details, hardware, attachments to other work, clearances required and the following:
  - .1 Installation details including wall conditions, framed opening tolerances, anchorage locations, rough opening and general installation requirements.
  - .2 Mullion details: fabrication, reinforcements and stiffeners.
  - .3 Flashing and drainage details: including air barrier and transition membrane flashing seal to adjacent construction.
  - .4 Glazing details: information on insulating glass unit.
  - .5 Weatherstripping details.
  - .6 Thermal break details

.4 Samples:
- .1 Submit two (2) samples, 300 mm x 300 mm in size illustrating typical corner construction, accessories and finishes for review and acceptance by Departmental Representative.
- .2 Samples will not be returned.
- .3 Submit colour samples for selection by Departmental Representative.

.5 Test and Evaluation Reports:
- .1 Submit test reports from approved independent testing laboratories, certifying compliance with specifications, for:
  - .1 Windows classifications.
  - .2 Anodized finish, weathering characteristics.
  - .3 Air tightness.
  - .4 Water tightness.
  - .5 Wind load resistance.
  - .6 Condensation resistance.
  - .7 Sash strength and stiffness - operable casement projecting.
  - .8 Ease of operation - windows with operable lights.
  - .9 Forced entry resistance.
  - .10 Mullion deflection - combination and composite windows.

1.5 **CLOSEOUT SUBMITTALS**

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

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

1.6 QUALITY ASSURANCE

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

.2 Qualifications:
- .1 Manufacturer Qualifications: Company specializing in manufacturing products specified in this section.
- .2 Installer: experienced in performing work of this Section and approved by window manufacturer.

.3 Mock ups:
- .1 Construct mock ups in accordance with Section 01 45 00 - Quality Control.
- .2 Construct mock up panel of exterior wall assembly 1800 x 1800 mm incorporating window.
- .3 Mock-up will be used:
  - .1 To judge workmanship, substrate preparation, operation of equipment and material application.
  - .2 For testing to determine compliance with performance requirements.

.4 Construct mock up where directed by the Departmental Representative.

.5 Allow 48 hours for inspection of mock-up by Departmental Representative before proceeding with Work of this Section.

.6 When accepted by Departmental Representative, mock-up will demonstrate minimum standard for this work. Mock-up may remain as part of finished work.

1.7 DELIVERY, STORAGE AND HANDLING

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

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

.3 Storage and Handling Requirements:
- .1 Store materials off ground indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Handle fiberglass windows in accordance with manufacturer’s instructions to avoid damage. Protect units from elements, construction activities and other hazards.
- .3 Replace defective or damaged materials with new.

1.8 PROJECT CONDITIONS

.1 Install windows in accordance with safety and weather conditions specified by manufacturer’s product literature and recommendations specific to this project and location.

.2 Use caution in below freezing temperatures. Acclimatize all products to manufacturer’s recommended temperature range before installation.

1.8 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

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

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

.4 Place materials defined as hazardous or toxic in designated containers.

.5 Fold up metal banding, flatten and place in designated are for recycling.

1.9 **WARRANTY**

.1 At no cost to Departmental Representative remedy any defects in work of this section due to faults in materials and/or workmanship for a period of five (5) years from date of Substantial Performance.

.2 At no cost to Departmental Representative replace any window unit whose finish shows any defects such as delamination, blisters or excessive fading within five (5) years of Substantial Performance.

PART 2 - PRODUCTS

2.1 **SYSTEMS**

.1 Fiberglass window frame: casement type, to CAN/CSA-A440, pultruded fiberglass frame and sash, open-back frame insulated with extruded fiberglass insulation, with double glazed sealed insulated glass unit (IG). Acceptable products:
- .1 Series 300 windows by Cascadia Windows.
- .2 Series 325 windows by Accurate-Dorwin.
- .3 Series 700 windows, by InLine Fiberglass.
- .4 Or other equivalent product and manufacturer accepted during tendering period.

.2 All fiberglass windows by same manufacturer.

2.2 **WINDOW TYPE AND CLASSIFICATION**

.1 Type: Fixed, with casement vent. Windows with sealed double-glazed insulating unit.
- .1 Classification rating: to CAN/CSA-A440:
- .2 Air tightness: A3
- .3 Water tightness: B4
- .4 Wind load resistance: C3
- .5 Condensation resistance: Temperature Index, I-51
- .6 Forced Entry: F2
- .7 Glazing: G2
- .8 Side hinged, swing-out glazed casement units where indicated on drawings.
- .9 Limiter on casement operator to restrict unit opening to no more than 125 mm.

2.3 **MATERIALS**

.1 Framing Components:
- .1 Aluminum extrusions: AA 6063-T6 alloy, minimum 1.6 mm thick.
- .2 Aluminum plate and sheet: AA 1100 alloy.
- .3 Screws, bolts, nuts, washers, rivets and other fasteners incorporated into aluminum sections: aluminum or ANSI Series 300 stainless steel, or hot dip galvanized steel.
- .4 Anchoring devices: aluminum, non-magnetic stainless steel or hot dip galvanized steel.

.2 Glass and glazing materials: Triple-glazed, sealed insulating glass as specified in Section 08 80 00 - Glazing.

.3 Infill panel: internally reinforced, glazed edge sealed preventing air movement to glazing space inside air barrier line:
- .1 Outer face: 6 mm. thick float glass, coloured.
- .2 Core: glass fibre insulation core with RSI of 0.67 per 25mm. thickness.
- .3 Inner face: 1.5mm. thick aluminum.

.4 Caulking and sealants: as specified in Section 07 92 00 – Joint Sealing. VOC limit 250 G/L maximum to SCAQMD rule 1168.

2.4 **FABRICATION**

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

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

.3 Face dimensions detailed are maximum permissible sizes.

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

.5 Finish steel clips and reinforcement with shop coat primer to CAN/CGSB-1.40 380 g/m2 zinc coating to ASTM A/123/A123M.

.6 Fiberglass components shall be pultruded sections and shapes unless otherwise specified.

.7 Size units to allow for structural deflection of surrounding construction.

.8 Design work so that it will not be distorted, nor fasteners overstressed, from expansion and contraction of metal.

.9 Fastenings shall be concealed.

.10 Assemble all joints in main window frame and sash, neatly, in weathertight manner and secure by means of screws anchored into integral screw ports. Mechanically joined sections shall have hairline joints. Deburr and make smooth all sharp edges and corners. Fabricate entire window in a manner that will allow easy replacement of any defective, damaged or worn components, hardware or weather-stripping.

.11 Removable glazing stops shall be fabricated in sections not exceeding length of the pane of glass being restrained.

.12 Double weather-strip window units at all sash perimeters. Install all weather-stripping in specially extruded ports and secure to prevent shrinkage or movement.

.13 Make provisions to drain to exterior any moisture entering or forming inside systems while preventing passage of air, dirt or insects to the interior.

.14 Closures, covers and trim shall be extruded or formed to profiles shown and unless otherwise shown, minimum 2 mm thick.

2.5 **FINISHES**

.1 Finishes for fiberglass, aluminum and PVC components shall conform to AAMA 613, AAMA 620 and AAMA 2603.

.2 Fiberglass finish: standard baked enamel finish. Colour selection by Departmental Representative from full range of manufacturer's standard colours.

.3 Hardware and window operators: baked enamel finish to match fiberglass frame colour selection by Departmental Representative.

2.6 **GLAZING**

.1 Glaze windows in accordance with CSA-A440 / A440.1.

.2 Triple glazed insulating unit: as described in Section 08 80 00 Glazing.

.3 Glazing to be site installed, removable.

2.7 **AIR BARRIER AND VAPOUR RETARDER**

.1 Equip window frames with site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:

.1 Material: identical to, or compatible with, building air barrier and vapour retarder materials to provide required air tightness and vapour diffusion control throughout exterior envelope assembly.
.2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verification of Conditions: verify conditions of substrates previously installed under other Sections or Contracts are acceptable for product installation in accordance with manufacturer's written instructions.
.1 Visually inspect substrate in presence of Departmental Representative.
.2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

.1 Window installation:
.1 Install in accordance with CSA-A440/A440.1.
.2 Arrange components to prevent abrupt variation in colour.

.2 Caulking:
.1 Seal joints between windows and window sills with sealant. Bed sill expansion joint cover plates and drip deflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.
.2 Apply sealant in accordance with Section 07 92 00 - Joint Sealing. Conceal sealant within window units except where exposed use is permitted by Departmental Representative.

3.3 ACCEPTANCE

.1 Manufacturer to replace any glazed units broken, chipped or otherwise damaged during transport to site.

.2 Replacement units to be to same specification as that for original, damaged units.

3.4 ADJUSTING

.1 Adjust operating sashes and ventilators, hardware, weatherstripping and accessories for tight fit at contact points and smooth operation.

3.5 CLEANING

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

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

.3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

3.6 **PROTECTION**

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

.2 Repair damage to adjacent materials caused by window installation.

END OF SECTION

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

.2 Furnish and delivery of all finish hardware necessary for all doors. Also hardware as specified herein and as enumerated in “Set Numbers” and as indicated and requested by actual conditions of the building. The hardware shall include the furnishing of all necessary screws, special screws, bolts, special bolts, expansion shields, drop plates and all other devices necessary for the proper installation of the hardware.

.3 The Departmental Representative approval of the schedule will not be construed as certifying that the list is complete. Acceptance of the Hardware Schedule does not relieve the supplier of responsibility of errors or omissions.

.4 Hardware should not be ordered unless a corrected copy of the shop drawings is reviewed and returned from the specification writer and bearing the approval of the Departmental Representative.

.5 Aluminum Door hardware is to be ordered immediately after approval of shop drawings and shipped directly to the Aluminum Door supplier.

.6 Furnish, deliver and install all finish hardware necessary for all doors, also hardware as specified herein and as enumerated in hardware group indicated by actual conditions at the project site.

.7 The electrical hardware shall include the furnishing of plug in connections and final connections of Low voltage wiring at the door opening. Electrical hardware devices to be installed by Section 08 71 00 with all final connection with termination above the frame. Electric hardware devices for the proper operation and application of the hardware noted by connection notes in the hardware schedule. Power, conduit, low voltage wire to junction box above the frame. Connection of the card readers, maglocks and high voltage wire by the electrical section Division 28.

.8 Division 28 to provide high voltage wiring and conduit to the door opening or power supplies including conduit to hardware locations.

1.2 REFERENCES

.1 American National Standards Institute (ANSI) A117.1 Specification

- .1 ANSI/BHMA A156.1-2006, Butts and Hinges.
- .2 ANSI/BHMA A156.26-2006, Continuous Hinges.
- .3 ANSI/BHMA A156.13-2005, Mortise Locks and Latches.
- .4 ANSI/BHMA A156.3-2001, Exit Devices.
- .5 ANSI/BHMA A156.4-2000, Door Controls (Closers)
- .6 ANSI/BHMA A156.5-2001, Auxiliary Locks and Associated Products.
- .7 ANSI/BHMA A156.6-2005, Architectural Door Trim.
- .8 ANSI/BHMA A156.7-2003, Template Hinge Dimensions.
- .9 ANSI/BHMA A156.8-2005, Door Controls - Overhead Holders.

.10 ANSI/BHMA A156.15-2006, Closer/ Holder Release Device.

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

.12 ANSI/BHMA A156.18-2006, Materials and Finishes.

.13 ANSI/BHMA A156.19-2007, Power Assist and Low Energy Power Operated Doors.

.14 ANSI/BHMA A156.21-2006, American National Standards for Thresholds.

.15 ANSI/BHMA A156.22-2005, Door Gasketing and Edge Seal Systems.

.16 ANSI/BHMA A156.24-2003, Delayed Egress Locks.

.17 ANSI/BHMA A156.25-2002, Electrified Locking Devices.

.18 ANSI/BHMA A156.29-2001, American National Standards for Exit Locks, Exit Locks with Alarms, Exit Alarms, Alarms for Exits.

.19 ANSI/BHMA A156.30-2003, American National Standards for High Security Cylinders.

.20 ANSI/BHMA A156.31-2001, American National Standards for Electric Strikes and Frame Mounted Actuators.

.2 Canadian Standards Association (CSA)

.1 CAN/CSA-B651-04.Accessible Design for the Built Environment.

.3 Canadian Steel Door Manufacturer's Association (CSDMA).

.1 Standard Hardware Locations in Accordance with the Canadian Steel Door and Frame Association Guidelines.

.2 Recommended locations for Architectural Hardware for Wood Flush Doors.

.4 National Fire Protection Agency (NFPA)

.1 NBC - National Building Code – Latest Edition

.2 NFPA-80 - Standard for Fire Doors and Windows – Latest Edition

.3 NFPA101 - Life Safety Code – Latest Edition

.4 NFPA-105 - Smoke and Draft Control – Latest Edition

1.3 ABBREVIATIONS

.1 The following abbreviations are applicable to this section:

.1	AHC	Architectural Hardware Consultant
.2	ALD ALF	Aluminum Door and Frame
.3	ATMS/STMS	Arm/Strike to Template with Machine Screws
.4	BB or FBB	Ball Bearing Hinges
.5	BC	Back Check
.6	BTB	Back to Back
.7	B3E or B4E	Bevel 3 or 4 sides
.8	C to C, C/L	Centerline to Centerline
.9	CDC	Certified Door Consultant
.10	CMK	Construction Masterkeyed
.11	CSC	Construction Specifications Canada
.12	CSK	Countersunk Screw Holes.
.13	Cyl.	Cylinder of a lock

.14	Deg.	Degree of opening
.15	DEL	Delay Action
.16	DHI	Door and Hardware Institute
.17	DR	Door
.18	FC	Full Cover
.19	FS	Fail Safe
.20	FSE	Fail Secure
.21	FTMS	Full template machine screws
.22	½ TMS	Half template machine screws
.23	GMK	Grand Masterkeyed
.24	KA/KD	Keyed Alike, Keyed Different
.25	HMD/PSF	Hollow Metal Door, Pressed Steel Frame
.26	LH/RH	Left Hand, Right Hand
.27	LHR/RHR	Left Hand Reverse, Right Hand Reverse
.28	MK or MKD	Master Keyed
.29	NBC	National Building Code
.30	NRP	Non removable pin
.31	TB/SB	Thru Bolts, Sex Bolts
.32	TJ	Top Jamb
.33	ULC	Underwriters Laboratories Canada
.34	WD	Wood Door

1.4 SUBMITTALS

.1 Product Data:

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

.2 Samples:

.1 Upon Departmental Representative request submit samples of door hardware.

.2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.

.3 After approval samples will be returned for incorporation in the Work.

.3 Hardware List:

.1 Submit detailed hardware list and keying schedule.

.2 Hardware Schedule is to be submitted as per DHI vertical format which is in the "Sequence and Format for Hardware Schedules".

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

.4 Furnish other Sections with templates required for hardware preparation and installation. Issue templates when requested so as not to cause any delays but not before hardware list has received final review by Departmental Representative.

.3 (continued)

.5 Keying Schedule to be in accordance with DHI manual “Keying Systems Names and Nomenclature”. Key schedule is not to hold up the processing of the hardware list.

.6 Wiring Diagrams will only be supplied after the final approval of the Hardware Schedule. Submit wiring diagrams as requested for proper installation of electrical, electrical-mechanical and electrical-magnetic products.

.4 Manufacturer’s Instructions: Submit manufacturer’s installation instructions.

.5 Closeout Submittals: Provide operation and maintenance data for door closers, locksets, door holders, electrified hardware and fire exit hardware for incorporation into Operations and Maintenance Manuals specified in Section 01 78 00.

1.5 WARRANTY

.1 Provide guarantee.

.1	Closers	10 year
.2	Mortise Locks	10 year mechanical / 2 year electrical
.3	Electronic Closer	2 year
.4	Exit Device	3 years
.5	Hinges	Lifetime of Building
.6	All other Hardware	1 year

1.6 QUALITY ASSURANCE

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

.2 Meet requirements of National Building Code of Canada and other applicable regulations.

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

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

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

.6 Upon completion of finish hardware installation, hardware supplier shall inspect work and shall certify in writing that all items and their installation are in accord with requirements of Contract Documents and are functioning properly.

1.7 PRODUCT DELIVERY, HANDLING & STORAGE

.1 Packing, Shipping, Handling and Unloading:

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

.2 Package each item of hardware including fastenings, separately or in like groups of hardware, with necessary screws, keys, instructions and installation templates.

.1 (continued)

.3 All items of hardware should be itemized and tagged as per the approved Finish Hardware Schedule.

.4 Hardware for Aluminum Doors to be shipped directly to the Aluminum Door supplier. Hardware for Aluminum Doors will be ordered immediately after approval of shop drawings. Delays in ordering the Aluminum Door hardware will not be accepted.

.5 Shortages will not delay installation.

.6 Items damaged in shipment will be replaced properly with proper material.

.7 All Hardware shall be handled in a manner to avoid damage, marking and scratching.

.8 Hardware is to be inventoried on site and confirmed by the Contractor and Hardware Supplier.

.2 Storage and Protection:

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

1.8 WASTE DISPOSAL AND MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 74 21.

.2 Collect and separate metal, plastic, paper packing and corrugated cardboard and deposit in appropriate on site recycling bins.

.3 Dispose of corrugated cardboard, plastic packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

1.9 MAINTENANCE

.1 Provide maintenance materials in accordance with Section 01 78 00.

.2 Provide three sets of maintenance tools for closers, locks and exit devices as well as a complete set of installation instructions.

.3 After the building is occupied, arrange for an appointment with the Departmental Representative to instruct them of proper use, service, adjusting and maintenance of the hardware furnished in this section.

.4 Extra Material if required.

1.10 SITE VISITS

.1 The hardware supplier shall arrange at least four visits to the job site.

.1 Visit project at time of delivery of hardware and inspect the personnel who will be looking after the installation and issuing of hardware at the job site. Delivered hardware to be received, sorted and itemized at the jobsite with contractor.

.2 Second visit will be required for key meeting with the Departmental Representative at a location at their request.

.3 Third visit will take place when about sixty percent of hardware is installed.

.4 Check all hardware on site and correct any errors or shortages. Co-ordinate with contractor to determine proper time for visit.

.5 Fourth visit shall take place just prior to building turnover. All hardware shall be checked for proper installation and adjustment. Any errors shall be corrected and adjustments made. Check the key system and furnish a report along with maintenance manuals detailing any errors found.

.6 Cost of this service will be included as part of this Section and is not covered by any allowance amount.

PART 2 PRODUCTS

2.1 HARDWARE ITEMS

.1 Only locksets and latchsets listed are acceptable for use on this project.

.2 Use one manufacturer's products only for all similar items.

.3 Manufacturer's Listed:

.1 Hinges

.1 McKinney – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.2 Continuous Hinges

.1 McKinney – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.3 Locks

.1 Sargent – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.4 Card Locks

.1 Sargent Wireless – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.5 Exit Devices

.1 Sargent – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.6 Closers

.1 Sargent – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.7 Power Operators

.1 Nabco Gyro-Tech Entrance Solutions, Royal Door Ltd., 105 Henri Dunant Street, Moncton, NB, E1E 1E4.

.8 Flush Bolts

.1 Rockwood Manufacturing – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.9 Overhead Stops

.1 Sargent – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.10 Flatware

.1 Rockwood Manufacturing – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.11 Floor/Wall Stops

.1 Rockwood Manufacturing – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.12 Weatherstrip/Thresholds

.1 Pemko – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan, Ontario, L4H 4T9.

.13 Key Cabinet

.1 Telkee, 60 Starlifter Ave. Dover Delaware 19901-9254.

.14 Power Supplies

.1 Securitron – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan Ontario, L4H 4T9.

.15 Electric Strikes

.1 HESS – ASSA ABLOY Door Security Solutions Canada, 160 Four Valley Drive, Vaughan Ontario, L4H 4T9.

2.2 DOOR HARDWARE

.1 All fasteners to come complete with the hardware as described. Hardware supplier must be Advised immediately if required fasteners are not enclosed with hardware.

.2 Hardware must be installed with fasteners supplied by the manufacturer.

.3 Hinges Butts and hinges:

.1 To ANSI/BMHA A156.1, designated by letter A and numeral identifiers, followed by size and finish, as listed in Hardware Schedule.

.2 Non removable pins (NRP) for all exterior and out swinging secure doors.

.3 Exterior hinges and hinges in wet areas of stainless steel, brass or bronze.

.4 Interior hinges of plated steel, unless otherwise noted.

.5 Size and quantity to be as the manufacturers hinge selection guide.

.6 Unless otherwise scheduled, supply (1) hinge for every 762mm of door height.

.7 The width of hinges shall be sufficient to clear all trim.

.8 All hinges to be five-knuckle design and ball bearing.

.9 All electric hinges to be supplied with Electrolynx QC plug in connectors as specified.

.10 Finish to Dull Chrome 26D.

.11 Standard of Acceptance:

.1	Specified	Acceptable Alternates	
.2	ANSI	McKinney	Hager
.3	A8112	TA2714	BB1279
.4	A2112	TA2314	BB1191
.5	A8111	TA3786	BB1168
.6	A5111	TA3386	BB11699

.4 Continuous Geared Hinges: to ANSI/BMHA A156.26.

.1 Provide continuous hinges of the type and style noted in the Hardware legend.

.2 To be non-handed and completely reversible.

.3 Material: Extruded tempered aluminium.

.4 Material Standard: 6063-T6 Alloy.

.5 Configuration: Three interlocking extrusions in pinless assembly, installed to full height of door.

.6 Type: Full Mortise: 45mm for extra heavy duty weights.

.7 Length: Full height less 25mm.

.8 Strength: Heavy Duty – 27 bearings each leaf for 2108mm, minimum door weight 245 kg.

.9 Mortise Fasteners: TEK, #12 x ¾" inch, FHUC, Philips head screws.

.10 Size to suite door height complete with installation aids and fasteners to suit door an frame conditions.

.11 All electric hinges to be supplied with Electrolynx QC plug in connectors as specified.

.12 Finish to Anodized Aluminum US28.

.13 Standard of Acceptance:

.1	Specified	Acceptable Alternates	
.2	McKinney	Pemko	Hager (Roton)
.3	MCK-12HD	CFM83SLFHD	780-112HD

.5 Mortise locks and latches: to ANSI/BMHA A156.13, Series 1000 mortise lock, grade 1, designed for function as stated in Hardware Schedule.

.1 Locks shall meet or exceed the requirements of ANSI/BHMA A156.13 Series 1000, Operational Grade 1, and Security Grade 1 with all standard trims.

.2 Meets or exceeds impact requirements of ASTM F1577-95b Detention Locks for Swinging Doors.

.3 Locks shall be easily re-handed without opening the lock body.

.4 Multi-functional lock body to make it easy to change functions in the field.

.5 Locks shall comply with UL10C and UBC.

.6 Construction: Lock functions shall be manufactured in a single-sized case formed from 2.6mm steel minimum.

.7 Locks shall have field adjustable, beveled, armored front, with a 3mm thickness minimum.

.8 Locks shall have a one piece, 19mm throw anti-friction stainless steel latch.

.9 Deadbolts, where specified, shall be full one inch 25mm throw made of one-piece hardened stainless steel.

.10 Locks shall have a 70mm backset, standard.

.11 Electrical functions Fail Safe and Fail Secure, Voltage 12VDC or 24VDC Regulated. Full wave rectification installed inside the lockbody. Current .25 at 24VDC and .5 at 12VDC. UL and CUL listed for use on fire doors. Operating temperature: Max 66 (C) degrees and Min. -35(C) degrees.

.12 Strikes shall be non-handed with a curved lip. Strikes for pairs of doors to be supplied with short lip strike (82-0229). Not to extend beyond the face of the door.

.13 To ensure proper alignment, trim, knobs or levers, shall be through-bolted and fully interchangeable between rose and escutcheon.

.14 Lever handles: "LNL" design.

.15 Roses: round.

.16 Designed for function as stated in Hardware Schedule.

.17 Finished to 26D.

.6 Exit Devices: to ANSI/BMHA A156.3, Grade 1.

.1 Type , function , grade 1, conventional modern modern-narrow stile special (describe) design.

.2 Modern touch pad type, fabricated of brass, bronze, stainless steel or aluminum.

.3 UL listed for Accident Hazard or Fire Exit Hardware as required.

.4 Hex key dogging standard on non fire-rated exit devices. Cylinder dogging where specified.

.5 Exit devices shall be UL listed panic exit hardware. All exit devices for fire rated openings shall be ULC labeled fire exit hardware.

.6 Include all electrified functions as specified.

.7 Device Length as per manufacturer's guidelines.

.8 The design of the exit device shall eliminate the necessity of removing the device from the door for standard maintenance or keying changes.

.9 Trim as specified shall be through-bolted.

.10 All vertical rod in pairs to be less bottom rod where noted.

.11 Extension rods are required as per manufacturer's requirements.

.12 Electronic exit devices to have Linx quick connectors (QC).

.13 Exit devices to suite doors over 45mm where required.

.14 Finish and Function as specified in the Hardware Sets.

.15 Standard of acceptance:

.1 Specified Acceptable Alternates

.2

ANSI Type	Sargent	Corbin	Yale
.3 Type 01	8800 - Series	ED5200	7100
.4 Type 02	8700 - Series	ED5400	7110
.5 Type 08	8600 - Series	ED5800	7120
.6 Type 04	8500 - Series	ED4200	7200
.7 Type 06	8400 - Series	ED4800	7220

.7 Door controls (closers): to ANSI/BMHA A156.4 as listed in Hardware Schedule.

.1 Designated by letter C and numeral identifiers listed in Hardware Schedule, size in accordance with ANSI/BHMA A156.4, table A1.

.2 All closers for both interior and exterior doors shall be the product of one manufacturer and be matched in style.

.3 Surface closers shall be adjustable to provide sizes 1 through 6 and comply with ADA.

.4 Full rack and pinion construction.

.5 Closing speed, latching speed and backcheck shall be controlled by key operated valves.

.6 Captivated valves.

.7 Delayed action feature shall be available and controlled by a separate valve.

.8 Delayed action shall be available in addition to, not in lieu of, backcheck.

.9 The one piece closer body shall be of die cast aluminum alloy with 14% silicon minimum content. An increase of 15% in closing power shall be provided by means of adjustment of the arm leverage at the foot connection. (Standard Arm).

.10 All arms shall be finely finished with heavy duty forged steel main arm.

.11 Two mounting positions of the closer shall meet all requirements. Standard mountings shall provide 120° door opening and alternate mounting 180° door opening.

.12 All closers shall be suitable for standard, top jamb, parallel arm and track type applications when provided with proper brackets and arms.

.13 Closer covers shall be of high impact plastic material of flame retardant grade.

.14 Secured by machine screws.

.15 Spring power shall be continuously adjustable over the full range of closer sizes and allow for reduced opening force for the physically handicapped. Hydraulic regulation shall be tamper proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed and backcheck.

.16 All closer to have a forged steel main arm and forged forearm for parallel arm closers.

.17 Finish to Aluminum 689.

.18 Standard of acceptance:

.1 Specified Acceptable Alternates:

.2	ANSI Type	Sargent	Norton	Corbin
.3	C02011	1431	8500	DC6200
.4	C02021	351	7500	DC3000
.5		421	2800ST	DC5000

.8 Architectural door trim: to ANSI/BHMA A156.6, as listed in Hardware Schedule, finished to stainless steel 32D.

.1 Door protection plates: kickplates type, 1.3 mm thick stainless steel, 203mm high, unbevelled edges, width less 40mm push side, width less 25mm on pull side for single doors. Width less 25mm for pairs. Finished to stainless steel 630.

.1 Standard of acceptance:

.1	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	J102	K1050	K10A

.2 Push plates: 1.3 mm thick stainless steel, size 89mm x 381mm, finished to stainless steel 630.

.1 Standard of acceptance:

.1	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	J301	70RC	K14A

.8 (continued)

.3 Door Pulls: 19mm round pull, 228.6mm center to center pulls, with 76mm x 305mm protection plate, mount type 1, finished to stainless steel 630.

.1 Standard of acceptance:

	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	J406	111 x 73CL	K14 x 2409-1(RC)

.4 Door Pulls: 32mm Round Offset Pull, mount type 1, 1220mm center to center, mounting to be with a security bolt (#4B) for single application and (#5) for back to back, finished to stainless steel 630.

.1 Standard of acceptance: Standard Metal D-352 x Mnt.

	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	J402	BF159	3018-2

.9 Door controls - overhead stop: to ANSI/BMHA A156.8, heavy duty construction, BHMA Grade 1 Certified, heavy duty architectural bronze construction.

.1 UL Classified: The 590 and 690 stops are UL 10B and UL 10C classified as miscellaneous fire door accessories.

.2 Corrosion resistance: Brass construction provides corrosion resistance in a variety of conditions.

.3 Holder Selector: 590 and 690 series holders are equipped with a turn knob to activate and deactivate the hold open function

.4 Thru bolts capture channel and end caps.

.5 Heavy duty shock spring absorbs load and gradually stops door.

.6 Blade shim required for all Aluminum Doors.

.7 Sized as per manufacturer's guidelines. Take into account other hardware mounted on doors.

.8 Finishes

.1 Exterior to stainless steel, 26D.

.2 Interior to steel sprayed finish, EN.

.9 Standard of acceptance:

	Specified	Acceptable Alternates	
.2	ANSI Type	Rixson	Sargent
.3	C01541	#1 (Concealed)	690
.4	C02541	#9 (Surface)	590
.5	C05542	#55 (Surface)	1540

.10 Door Stops and Holders and Auxiliary hardware: to ANSI/BMHA A156.16 designated by letter L and numeral identifiers as listed in Hardware Schedule finished to 26D.

.1 Floor stops dome style classification. Low dome or High dome. Die cast brass. Stops to be sized according to door clearances, thresholds or undercuts as noted in the Door Schedule. Fasteners to suite floor conditions.

.1 Standard of acceptance:

	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	L02141	441	S101
.4	L02161	443	S103
.5	L02131	483	S110
.6	L02141	441H	

.2 Wall stops classification, convex or concave, cast brass or bronze. Fasteners to suite wall conditions.

.1 Standard of acceptance:

	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	L02101	406	S121
.4	L02251	409	S123

.3 Flush Bolts classification. Meets ANSI/BMHA A156.16. Bolt tip is 13mm Diameter with 19mm throw and bolt backset of 19mm. To be supplied with F68 Dust Proof Strike.

.1 Wood doors

.1 Standard of acceptance: DCI 790.

.2 Metal Doors

.1 Standard of acceptance: Standard Metal F65.

.3 Standard of acceptance:

	Specified	Acceptable Alternates	
.2	ANSI Type	Rockwood	Standard Metal
.3	L04261	557	
.4	L04251	555	F65
.5	L04021	570	F68
.6	Type 272845	840	
.7	Type 272945	940	

.11 Power assist and low energy power operated doors: to ANSI/BMHA A156.19.

.1 Automatic operators shall be complete with all components including Operator Housing, Power Operator, Electronic Control, Soft Start, Switching Networks and all Connecting Hardware.

.2 Size and type to be as indicated in Hardware Groups.

.3 Operator Housing shall be complete with finished end caps prepared for mounting to door frame.

.4 Operator shall be factory assembled with all necessary components for proper operation and switching. Relays, wiring harness and other components shall be plug-in type.

.11 (continued)

.5 Operator controls shall include adjustable time delay, safe-swing circuit as well as provision for accessories as detailed in Hardware Groups.

.6 All wiring shall be of the shielded type with proper number of conductor wires to install all components specified.

.7 Operator shall include sufficient power supplies to operate all hardware and accessory items as detailed in Hardware groups. In the event additional power supplies are required it shall be added at no increase in contract price.

.8 Complete unit shall be mounted with provisions for easy servicing or replacement without removing the door or frame.

.9 Confirm frame detail and if necessary provide a suitable mounting plate to install operator properly.

.10 Standard of acceptance:

.1	Specified	Acceptable Alternates	
.2	Gyro-Tech	Besam	Hunter
.3	GT20	SW200i	HA-08

.12 Thresholds and Weatherstripping Thresholds: to ANSI/BMHA A156.21.

.1 Saddle threshold 152.4 mm wide x full width of door opening, extruded aluminum mill finish, serrated surface, with thermal break of rigid PVC.

.2 Panic threshold 93.7 mm wide x full width of door opening, extruded aluminum mill finish, serrated surface, with lip and vinyl door seal insert.

.3 Standard of acceptance:

.1	Specified	Acceptable Alternates	
.2	PEMKO	KN Crowder	Hager
.3	253 x 3AFG	CT46A	421S
.4	254 x 4AFG	CT45-1/CT-43-1	515S
.5	1842A	CT-40S	

.13 Door Gasketing and Edge Seal Systems: to ANSI/BMHA A156.22.

.1 Head and Jamb seal:

.1 Extruded aluminum frame and neoprene insert, clear anodized finish.

.2 Surface overhead stops and exit device strikes to mount on top of weatherstrip to provide continuous seal.

.3 Adhesive backed black “Santoprene” to provide smoke, light and sound control. Fire labeled 1 1/2hrs.

.4 Standard of acceptance:

.1	Specified	Acceptable Alternates	
.2	PEMKO	KN Crowder	Hager
.3	319S	W-14S	878S
.4	290APK	W20N	881S
.5	2891AS	W20S	881S
.6	S88B	W22	726S

.13 (continued)

.2 Door bottom seal:

.1 Extruded Aluminum frame and nylon brush sweep, clear anodized finish.

.2 Heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene weather seal, recessed in door bottom, closed ends, automatic retract mechanism when door is open, clear anodized finish.

.3 Standard of acceptance:

	Specified	Acceptable Alternates	
.1	PEMKO	KN Crowder	Hager
.2	3452CNB	W35-1	770SB
.3	18100CNB	W24S	801SB
.4	4301	CT-52	747S

.3 Astragal:

.1 Flat overlapping extruded aluminum by door height with pile insert.

.2 Meeting astragal extruded aluminum frame with brush insert by each door by door height, clear anodized finish.

.3 Standard of acceptance:

	Specified	Acceptable Alternates	
.1	PEMKO	KN Crowder	Hager
.2	357CS	W8S	835S
.3	18061CNB	W-25S	802SB
.4	3672A	W8P	835

.14 WiFi Access Control Mortise Locks

.1 Lever type mortise lock conforming to ANSI/BHMA A156.13 Grade 1 mortise standard and ANSI A117.1 accessibility guidelines. Electronic motorized locking control of lever handle trim with 19mm anti-fricyion deadlocking latch and 25mm case-hardened steel deadbolt. UL listed and labelled for up to 3 hour fire ratings.

.2 WiFi access control locking devices interface using field replaceable IEEE 802.11b/g/n, 2.4 GHz wireless radio connection to an Ethernet Local Area Network facilitating centralized control via a Software Development. Locks will continue to operate independent of the Ethernet wireless connection slowdown or failure.

.3 Supports WEP, WPA, WPA2 and 802.1x wireless encryption (IEEE 802.11 b/g/n, 2.4 GHz). AES 128 encrypted communication between IP Enabled lock and electronic access control system platform via SDK. Programmable time zone periods, blocked holidays, automatic unlock with or without first entry, minimum of 2,400 user codes and the ability to audit the last 10,000 transactions (event type, date, time, user ID and name). Distributed intelligence allows stand alone functional operation of lock in absence of network communication or slowdown allowing for system operational redundancy.

.4 Integrated reader supports HID 125 kHz proximity credentials or ISO 14443 A/B and ISO 15693 13.56 MHz contactless credentials: HID iCLASS / iCLASS SE (full authentication, all formats), MIFARE Classic and DESFire EV1 (full authentication, all formats); NFC (Near Field Communications) and HID SIOEnabled.

.14 (continued)

.5 Environmental Conditions: Conformally coated weather resistant electronic controller shall meet the following minimum requirements:

.1 Operating temperature: -13°F (-25°C) to 151°F (66°C)

.2 Operating humidity: < 85% non-condensing

.3 Weatherized design suitable to withstand harsh environments with a certified rating of IP55.

.6 Configuration: Programming of time zone periods, blocked holidays, automatic unlock with or without first entry, and listing 10,000 event transaction history consisting of event type, date, time, user ID and name is required.

.1 Provide network and lock configuration CD tool kit for initial lock set-up and programming via USB connection.

.7 Monitoring: Software accessible monitoring (via SDK) of inside lever handle (Request-to-Exit), door position switch (DPS) integral to the lock (door open/closed status), forced door, unknown card, door held open, battery and tamper.

.1 Privacy function initiated from push button on inside escutcheon and cancelled upon activation of valid Request-To-Exit (REX) or user defined credentials.

.8 Emergency override access capability by mechanical key cylinder retraction of lock latch bolt without electronic activation necessary.

.9 Inside lever retracts latch bolt.

.10 Power Source: Locks to use optional hard wired power by means of 12-24 VDC power supply.

.11 Cylinders: Keying for keying requirements.

.12 Standard of acceptance:

	Specified	Acceptable Alternates
.1		
.2	IN120	Persona 1000 (P2)

.15 Power Supplies:

.1 Dual output, field selectable 12 or 24 VDC via clearly marked toggle switch.

.2 Supplies 1 full AMP continuous current output, even while charging back-up batteries.

.3 SPDT AC monitoring output allows for remote monitoring of the power supply's 110V AC input.

.4 Separate voltage inputs for load and battery allow the batteries to charge at a higher output while the load remains at exactly 12 or 24 VDC.

.5 LED indication (AC & DC) showing power supply status UL listed low current fire alarm disconnect requires only a minimum size fire alarm relay and wire gauge Polyswitch type breakers allow for large short duration inrush current if batteries are installed (approx. 20A for 1 second) Line voltage and DC fuses Sealed lead acid-gel battery charging capability (battery not included).

.6 UL Class 2, linear regulated power supply provides the cleanest power available sensitive, active safety and security devices.

.7 UL Listed.

.8 CFAR Relay - Securitron's Fire Alarm reset module interconnects with a Securitron BPS series power supply and a fire alarm (made by others). The purpose is to provide additional safety and control in an installation where activation of the fire alarm is intended to switch off the BPS power supply.

.15 (continued)

.9 This is often done to release power to magnetic locks which are installed on perimeter doors so as to permit safe evacuation in the event of a fire. The module has three specific functions:

.1 It will maintain the released condition of devices released by activation of the fire alarm even after the fire alarm resets and until the module itself is reset by key.

.2 It allows key controlled release of the same devices (separate from the fire alarm control).

.3 It signals the released or "normal" condition of the devices via a bicolor LED.

.10 Standard of acceptance:

	Specified	Acceptable Alternates
.1		
.2	Securitron	Sargent
.3	BPS	3500

.16 Key Switches:

.1 Mortise Keyswitch – MKA Series.

.2 Standard with 12 or 24 VDC bi-color LED

.3 Backing bracket permits integration with any 32mm or 28mm mortise cylinder (Not Included)

.4 Additional switch position on backing bracket allows another switch to be activated by turning the key in the opposite direction 5 Amp rated plunger switch UL Listed.

.17 Door Status Switch:

.1 Monitors door position remotely.

.2 SPDT concealed switch (3 wire).

.3 Contacts rated .25 Amp @24 VDC, requires 25mm diameter hole.

.4 Standard of acceptance:

	Specified	Acceptable Alternates
.1		
.2	Sargent	Securitron
.3	3287	DPS W/M

2.3 FASTENINGS

.1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.

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

.3 Exposed fastening devices to match finish of hardware.

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

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

2.4 FINISHES

	Description	Material	BMHA
.2	Exterior Hinges	Stainless Steel Metal, Satin	630
.3	Interior Hinges	Satin Chromium Plated	626
.4	Locks	Stainless Steel Metal, Satin	630
.5	Exit Devices	Satin Chromium Plated	626
.6	Closers	Aluminum Powder Coated	689
.7	Flatware	Stainless Steel Metal, Satin	630
.8	All other items	Satin Chromium Plated	626

2.5 KEYING

.1 All locks to be masterkeyed to a new factory registered masterkey system. Prepare detailed keying schedule in conjunction with Departmental Representative DCC Representative Consultant.

.2 All cylinders to be Degree Series.

.3 All cylinders to be construction master keyed.

.4 All locks and cylinders to be visually keyed.

.5 Consult with the Departmental Representative and secure written approval of the complete keying layout prior to placing lock order with the factory.

.6 Grand masterkeys and masterkeys shall be sent directly to the Departmental Representative by registered mail, return receipt if requested.

Supply:

1.	Grand Masterkeys	3
2.	Masterkeys	3 per group
3.	Change Keys/Lock	4
4.	Construction Masterkeys	10

2.6 KEY CONTROL

.1 Provide a key control system, including envelopes, labels with self-locking clips, receipt forms, 3-way visible card index, temporary markers and permanent markers and standard metal cabinet. Allow for 150% of the number of locks required on the project.

.2 Provide complete cross index system set up by the Hardware Supplier and place keys on markers and hooks in the key cabinet as determined by the final key schedule.

.3 Install and give instruction to Departmental Representative on how the system is to be used.

.4 Provide hinged-panel type cabinet for wall mounting.

.5 Standard of acceptance: TCA-234-S.

PART 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

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

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

.4 Wiring Diagrams: Provide any special information, voltage requirements and wiring diagrams to other trades requiring such information.

3.2 INSTALLATION

.1 Install door hardware in accordance with manufacturer's instructions, using special tools and jigs. Fit accurately and apply securely. Ensure that hardware is installed correctly. Issue instructions if required to Sections concerned.

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

.3 Installation is to be done by a qualified tradesman, if technical assistance is required contact the hardware supplier.

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

.5 Install key control cabinet.

.6 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.7 Remove construction cores and locks when directed by Contractor; install permanent cores and check operation of locks.

.8 Hardware should not be installed until all finishing is complete.

.9 All hardware to be installed level plumb and true.

.10 All operating parts to work freely and smoothly.

.11 Exterior thresholds to be set in exterior sealants.

.12 Install Power Operators as per manufacturer's instructions and by a qualified installer.

.13 Access control to be installed by a certified installer.

.14 High voltage wiring by Division 28. Low voltage wiring by access control supplier.

3.3 ADJUSTING

.1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.

.2 Lubricate hardware, operating equipment and other moving parts.

.3 Adjust door hardware to provide tight fit at contact points with frames.

.4 All defective or damaged hardware will have to be repaired or replaced at the contractors expense.

3.4 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacturer's instructions.

.3 Remove protective material from hardware items where present.

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

.2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

.1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.5 DEMONSTRATION

.1 Keying System Setup and Cabinet:

.1 Set up key control system with file key tags, duplicate key tags, numerical index, alphabetical index and key change index, label shields, control book and key receipt cards.

.2 Place file keys and duplicate keys in key cabinet on their respective hooks.

.3 Lock key cabinet and turn over key to Departmental Representative.

.2 Maintenance Staff Briefing:

.1 Brief maintenance staff regarding:

.2 Proper care, cleaning, and general maintenance of projects complete hardware.

.3 Description, use, handling, and storage of keys.

.4 Use, application and storage of wrenches for door closers, locksets and fire exit hardware.

.5 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.6 FIELD QUALITY CONTROL

.1 An inspection report will be required 6 months after substantial completion by a qualified Architectural Hardware Consultant to note any deficiencies. The inspection should include checking each lock against the key schedule to make sure the correct locks and cylinders are on the proper doors.

3.7 PROTECTION

.1 Protection must be given to all products and finishes until such time as the Departmental Representative accepts the project.

3.8 CERTIFICATION

.1 After installation, Hardware Supplier is to have a regular member of the Architectural Hardware Consultants'' (AHC) Association inspect and certify in writing that all items and their installations are in accordance with specified requirements.

3.9 HARDWARE SCHEDULE

.1 The door hardware sets represent the design intent and direction of the Departmental Representative. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the Departmental Representative with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

.2 The supplier is responsible for handing and sizing all products as listed in the door hardware sets. Quantities listed are for each pair of doors, or for each single door.

.3 Products listed in the Door Hardware Sets must meet the requirements described in the specification sections noted.

3.10 HARDWARE SCHEDULE

Set: 1.0

1	Continuous Hinge	CFM x Height x SLF-HD1		PE
1	Continuous Hinge	CFM x Height x SLF-HD1 PT		PE
1	Exit Device	DG1 16 31 63 64 AD8413 ETL (Type 6, Function 08)	US32D	SA
1	Exit Device	DG1 31 55 56 63 64 AD8413 ETL (Type 6, Function 08)	US32D	SA
1	Cylinder	DG1 63 64-41	US26D	SA
2	Concealed Overhead Stop	1-X36 (ANSI C01541)	630	RF
1	Door Closer (surface)	421 PCTB (Push Side)	EN	SA
1	Cover Plate	1431J	EN	SA
1	Power Operator	GT20 x Full Header	689	BM
1	Mounting Plate	Mounting Plate x Full Header	Std	BM
1	Backing Plate	Backing Plate x Full Header	Std	BM
2	Wall Actuaor 114mm	10BR451 - Wall Mount Actuator	32D	BM
2	Escutcheon 114mm	10ESCUTCHEON45	32D	BM
1	Lock Out Relay	LE-21	Std	BM
1	Sensors (Pull Side)	Superscan11	Std	BM
1	Sensors (Push Side)	Superscan 11	Std	BM
1	Door Switch	10SWITCH75	Std	BM
1	Relay Switch	CX-33	Std	00
1	Threshold	253x3AFG x Door Width		PE
1	By Aluminum Door Supplier	Weatherstripping	Std	00
2	Sweep	3452CNB x Door Width		PE
1	Electric Power Transfer	EL-CEPT		SU
1	Key Switch	MKA2 x MKSA2	32D	SU
2	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Power Supply	BPS-24-2		SU
1	Raceway Harness Wires W/Pins-2'0	93993-QC-C200P-QC12-12	Std	MK
1	Wiring Harness Wires W/Pins-15'0	93998-QC-1500P-QC12-12	Std	MK
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
REQUIRES 120VAC POWER TO POWER OPERATOR LOCATION BY ELECTRICAL SUPPLIER.
REQUIRES 120VAC POWER TO POWER SUPPLY LOCATION BY ELECTRICAL SUPPLIER.
REQUIRES LOW VOLTAGE FROM POWER OPERATOR TO POWER SUPPLY LOCATION.
REQUIRES LOW VOLTAGE FROM POWER OPERATOR TO EXIT DEVICE LOCATION.
REQUIRES LOW VOLTAGE FROM POWER OPERATOR TO ACTUATOR BUTTON LOCATION.
REQUIRES LOW VOLTAGE FROM POWER SUPPLY TO EXIT DEVICE LOCATION.
REQUIRES LOW VOLTAGE WIRE FROM KEY SWITCH TO POWER SUPPLY.
REQUIRES CONDUIT TO BE SUPPLIED AND INSTALLED BY THE ELECTRICAL SUPPLIER.
REQUIRES WIRE AND WIRE PULL BY THE ELECTRICAL SUPPLIER.
REQUIRES WIRE CHASE IN THE DOOR.

MODE OF OPERATION:
DOORS TO BE IN THE UNLOCKED POSITION AT ALL TIMES. DOORS CAN BE MANUALLY OPENED BY DEPRESSING THE LEVER AND MANUALLY OPENENING THE DOOR. THE DOOR CAN BE AUTOMATICALLY OPENED BY ACTIVATING THE ACTUATOR SWITCHES EITHER SIDE OF THE DOOR. ACTIVATING THE INTERIOR ACTUATOR BUTTON WILL SIMULTANEOUSLY RETRACT THE LATCH AND ACTIVATE THE POWER OPERATOR. KEY SWITCH CAN ACTIVATE OR DEACTIVATE THE EXTERIOR ACTUATOR BUTTON OR ELECTRIC LATCH RETRACTION. ENTRY BY KEY. FREE EXIT AT ALL TIMES.
LOCATION OF ACTUATOR BUTTONS TO BE DETERMINED.

Set: 2.0

1	Continuous Hinge	CFM x Height x SLF-HD1		PE
2	Continuous Hinge	CFM x Height x SLF-HD1 PT		PE
1	Exit Device	DG1 16 63 64 AD8413 ETL (Type 6, Function 08)	US32D	SA
1	Exit Device	DG1 55 56 63 64 AD8413 ETL (Type 6, Function 08)	US32D	SA
2	Concealed Overhead Stop	1-X36 (ANSI C01541)	630	RF
1	Door Closer (surface)	421 PCTB (Push Side)	EN	SA
1	Cover Plate	1431J	EN	SA
1	Power Operator	GT20 x Full Header	689	BM
1	Mounting Plate	Mounting Plate x Full Header	Std	BM
1	Backing Plate	Backing Plate x Full Header	Std	BM
2	Wall Actuaor 114mm	10BR451 - Wall Mount Actuator	32D	BM
2	Escutcheon 114mm	10ESCUTCHEON45	32D	BM
1	Lock Out Relay	LE-21	Std	BM
1	Sensors (Pull Side)	Superscan11	Std	BM
1	Sensors (Push Side)	Superscan 11	Std	BM
1	Door Switch	10SWITCH75	Std	BM
1	Relay Switch	CX-33	Std	00
1	Electric Power Transfer	EL-CEPT		SU
2	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
REQUIRES 120VAC POWER TO POWER OPERATOR LOCATION BY ELECTRICAL SUPPLIER.
REQUIRES 120VAC POWER TO POWER SUPPLY LOCATION BY ELECTRICAL SUPPLIER.
REQUIRES LOW VOLTAGE FROM POWER OPERATOR TO POWER SUPPLY LOCATION.
REQUIRES LOW VOLTAGE FROM POWER OPERATOR TO EXIT DEVICE LOCATION.
REQUIRES LOW VOLTAGE FROM POWER OPERATOR TO ACTUATOR BUTTON LOCATION.
REQUIRES LOW VOLTAGE FROM POWER SUPPLY TO EXIT DEVICE LOCATION.
REQUIRES LOW VOLTAGE WIRE FROM KEY SWITCH TO POWER SUPPLY.
REQUIRES CONDUIT TO BE SUPPLIED AND INSTALLED BY THE ELECTRICAL SUPPLIER.
REQUIRES WIRE AND WIRE PULL BY THE ELECTRICAL SUPPLIER.
REQUIRES WIRE CHASE IN THE DOOR.

MODE OF OPERATION:
DAYTIME OPERATION:
THE DOOR TO BE SECURED AT ALL TIMES. ENTRY BY KEY OR REMOTE RELEASE. WHEN ENTRY BY REMOTE RELEASE FROM THE SECURITY DESK THE REMOTE RELEASE WILL ACTIVATE THE ELECTRIC LATCH RETRACTION IN THE EXIT DEVICES AND THE SIGNAL SWITCH IN THE RAIL. WHEN THE SIGNAL SWITCH IN THE RAIL IS ACTIVATED THE EXTERIOR ACTUATOR BUTTON WILL BE ENABLED. THE DOOR MAY BE MANUALLY PULLED OPEN OR AUTOMATICALLY BY ACTIVATING THE ACTUATOR SWITCHES EITHER SIDE OF THE DOOR. THE INTERIOR ACTUATOR BUTTON WILL ALWAYS RETRACT THE LATCH AND SIMULTANEOUSLY ACTIVATE THE POWER OPERATOR. ENTRY BY KEY.
FREE EXIT AT ALL TIMES.
LOCATION OF ACTUATOR BUTTONS TO BE DETERMINED.

Set: 3.0

1	Continuous Hinge	CFM x Height x SLF-HD1		PE
1	Exit Device	DG1 31 63 64 AD8513 ETL (Type 4, Function 08)	US32D	SA
1	Concealed Overhead Stop	1-X36 (ANSI C01541)	630	RF
1	Door Closer (surface)	421 PCTB (Push Side)	EN	SA
1	Cover Plate	1431J	EN	SA
1	Threshold	253x3AFG x Door Width		PE
1	By Aluminum Door Supplier	Weatherstripping	Std	00
1	Sweep	3452CNB x Door Width		PE
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
DOOR CONTACT TO BE TIED TO BUILDING SECURITY SYSTEM.

Set: 4.0

3	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Continuous Hinge	CFM x Height x SLF-HD1		PE
1	Exit Device (exit only)	8810(Type 1, Function 01)	US32D	SA
1	Door Closer	351 CPS (ANSI C02021)	EN	SA
1	Drop Plate	351B	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Threshold	254x4AFG x Door Width		PE
1	Threshold	1842APK x Door Width		PE
1	Gasketing	2891AS x 3 Sides		PE
1	Sweep	3452CNB x Door Width		PE
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
DOOR CONTACT TO BE TIED TO BUILDING SECURITY SYSTEM.

Set: 5.0

1	Continuous Hinge	CFM x Height x SLF-HD1		PE
1	Exit Device (exit only)	12 8810 (Type 1, Function 01)	US32D	SA
1	Door Closer	351 CPS (ANSI C02021)	EN	SA
1	Drop Plate	351B	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Threshold	254x4AFG x Door Width		PE
1	Threshold	1842APK x Door Width		PE
1	Gasketing	2891AS x 3 Sides		PE
1	Sweep	3452CNB x Door Width		PE
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
DOOR CONTACT TO BE TIED TO BUILDING SECURITY SYSTEM.

Set: 6.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Passage Set	8215 LNL (ANSI F01)	US26D	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO

Set: 7.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Passage Set	8215 LNL (ANSI F01)	US26D	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

Set: 8.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Office Lock	DG1 63 64 8205 LNL (ANSI F04)	US26D	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

Set: 9.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Classroom Lock	DG1 63 64 8237 LNL (ANSI F05)	US26D	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

Set: 10.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Classroom Lock	DG1 50 63 64 8237 LNL (ANSI F05)	US26D	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

Set: 11.0

3	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Classroom Lock	DG1 63 64 8237 LNL (ANSI F05)	US26D	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

Set: 12.0

6	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Dust Proof Strike	570 (ANSI L04021)	US26D	RO
1	Flush Bolt (Latching)	2845 (Hollow Metal) (ANSI Type 27)	US32D	RO
1	Classroom Lock	DG1 63 64 8237 LNL (ANSI F05)	US26D	SA
1	No Lip Strike (82-0229)	82-0229	US26D	SA
2	Door Closer (surface)	421 CTB (Pull Side)	EN	SA
2	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
2	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Astragal	355CS x Height		PE
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

Set: 13.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO

Set: 14.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE

Notes:
DOOR CONTACT TO BE TIED TO BUILDING SECURITY SYSTEM.

Set: 15.0

3	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Surface Overhead Holder	55-X26 (ANSI C05512)	652	RF
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO

Set: 16.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Door Closer	1431 O (ANSI C02011)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Universal Door Stop	441H (ANSI L02141)	US26D	RO

Set: 17.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Door Closer	1431 O (ANSI C02011)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Gasketing	319CS x 3 Sides		PE

Set: 18.0

3	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Door Closer	1431 CPS (ANSI C02021)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Gasketing	319CS x 3 Sides		PE

Set: 19.0

6	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
2	Flush Bolt	555 (ANSI L04251)	US26D	RO
1	Dust Proof Strike	570 (ANSI L04021)	US26D	RO
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	No Lip Strike (82-0229)	82-0229	US26D	SA
2	Door Closer (surface)	421 PCTB (Push Side)	EN	SA
2	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
2	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Gasketing	319CS x 3 Sides		PE
1	Astragal	355CS x Height		PE

Set: 20.0

6	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
2	Flush Bolt	555 (ANSI L04251)	US26D	RO
1	Dust Proof Strike	570 (ANSI L04021)	US26D	RO
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	No Lip Strike (82-0229)	82-0229	US26D	SA
2	Surface Overhead Holder	55-X26 (ANSI C05512)	652	RF
2	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Astragal	355CS x Height		PE

Set: 21.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Privacy Set	LB 8265 LNL (ANSI F22)	US26D	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO

Set: 22.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Institutional Privacy Lock	DG1 LB 50 63 64 8267 LNL (ANSI F26)	US26D	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO

Set: 23.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Electric Strike	1006-12/24-LBM (ANSI E09321)	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Door Closer (surface)	421 CTB (Pull Side)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Power Supply	BPS-24, To Be Shared - Note in Misc Set	Std	SU
1	Card Reader	By the Electrical Contractor		00
1	Controller	By the Electrical Contractor		00
1	Wiring Harness Wires W/Pins-15'0	93998-QC-1500P-QC12-12	Std	MK
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
REQUIRES 120VAC POWER TO POWER SUPPLY LOCATION BY ELECTRICAL CONTRACTOR.
REQUIRES LOW VOLTAGE FROM POWER SUPPLY TO ELECTRIC SRIKE LOCATION.
REQUIRES LOW VOLTAGE AND COMMUNICATION WIRE BY ELECTRICAL CONTRACTOR.
REQUIRES CONDUIT TO BE SUPPLIED AND INSTALLED BY ELECTRICAL SUPPLIER.
REQUIRES WIRE AND WIRE PULL BY ELECTRICAL SUPPLIER.

MODE OF OPERATION:
DOOR TO BE SECURED AT ALL TIMES. ENTRY BY AUTHORIZED CARD OR KEY.
ENTRY BY AUTHORIZED CARD WILL ACTIVATE ELECTRIC STRIKE FOR DOOR
TO BE MANUALLY OPENED. STANDARD FUNCTIONALITY FOR DOOR
CONTACTS AND REQUEST TO EXIT. LOCK HAS MECHANICAL KEY OVERIDE.
FREE EXIT AT ALL TIMES.

Set: 24.0

3	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Electric Strike	1006-12/24-LBM (ANSI E09321)	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Door Closer (surface)	421 PCTB (Push Side)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Power Supply	BPS-24, To Be Shared - Note in Misc Set	Std	SU
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00
1	Card Reader	By the Electrical Contractor		00
1	Controller	By the Electrical Contractor		00
1	Certified Installer	Access Control Installation		00
1	Wiring Harness Wires W/Pins-15'0	93998-QC-1500P-QC12-12	Std	MK
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
DOOR AND FRAME SOUND RATED TO STC-45.

REQUIRES 120VAC POWER TO POWER SUPPLY LOCATION BY ELECTRICAL CONTRACTOR.
REQUIRES LOW VOLTAGE FROM POWER SUPPLY TO ELECTRIC SRIKE LOCATION.
REQUIRES LOW VOLTAGE AND COMMUNICATION WIRE BY ELECTRICAL CONTRACTOR.
REQUIRES CONDUIT TO BE SUPPLIED AND INSTALLED BY ELECTRICAL SUPPLIER.
REQUIRES WIRE AND WIRE PULL BY ELECTRICAL SUPPLIER.

MODE OF OPERATION:
DOOR TO BE SECURED AT ALL TIMES. ENTRY BY AUTHORIZED CARD OR KEY.
ENTRY BY AUTHORIZED CARD WILL ACTIVATE ELECTRIC STRIKE FOR DOOR
TO BE MANUALLY OPENED. STANDARD FUNCTIONALITY FOR DOOR
CONTACTS AND REQUEST TO EXIT. LOCK HAS MECHANICAL KEY OVERIDE.
FREE EXIT AT ALL TIMES.

Set: 25.0

2	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Hinge - Electrified	TA2714 114mm x 102mm QC-4 (Middle) (ANSI A8112)	US26D	MK
1	Access Control Lock	DG1 63 64 91 IN120 82276 IP B LNL	26D	SA
1	Electric Strike	1006-12/24-LBM (ANSI E09321)	630	HS
1	SMART Pac Bridge Rectifier	2005M3		HS
1	Door Closer (surface)	421 PCTB (Push Side)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Power Supply	BPS-24, To Be Shared - Note in Misc Set	Std	SU
1	Sound Seal, Threshold and Auto Door Bottom	By Door Manufacturer	Std	00
1	Card Reader	By the Electrical Contractor		00
1	Controller	By the Electrical Contractor		00
1	Certified Installer	Access Control Installation		00
1	Raceway Harness Wires W/Pins-3'0	93995-QC-C300P-QC12-12	Std	MK
2	Wiring Harness Wires W/Pins-15'0	93998-QC-1500P-QC12-12	Std	MK
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
DOOR AND FRAME SOUND RATED TO STC RATING AS INDICATED.

DOORS TO BE ACTIVATED BY BOTH THE STAFF AND RESIDENT CARDS.
THE HID VERTEX MAIN CONTROLLER AND TWO DOOR CONTROLLERS LISTED IN THE MISCELLANEOUS SECTION ARE REQUIRED ON THESE DOORS FOR BOTH THE STAFF AND RESIDENT CARD ACCESS TO WORK ON IT.

REQUIRES 120VAC POWER TO POWER SUPPLY LOCATION BY ELECTRICAL CONTRACTOR.
REQUIRES LOW VOLTAGE FROM POWER SUPPLY TO ELECTRIC SRIKE LOCATION.
REQUIRES LOW VOLTAGE AND COMMUNICATION WIRE BY ELECTRICAL CONTRACTOR.
REQUIRES CONDUIT TO BE SUPPLIED AND INSTALLED BY ELECTRICAL SUPPLIER.
REQUIRES WIRE AND WIRE PULL BY ELECTRICAL SUPPLIER.
REQUIRES WIRE CHASE IN THE DOORS.

MODE OF OPERATION:
STAFF ENTRY:
DOOR TO BE SECURED AT ALL TIMES. ENTRY BY AUTHORIZED CARD OR KEY.
ENTRY BY AUTHORIZED CARD WILL ACTIVATE ELECTRIC STRIKE FOR DOOR TO BE MANUALLY PUSHED OPEN. STANDARD FUNCTIONALITY FOR DOOR CONTACTS AND REQUEST TO EXIT. LOCK HAS MECHANICAL KEY OVERIDE.
FREE EXIT AT ALL TIMES.
RESIDENT ENTRY:

DOOR TO BE SECURED AT ALL TIMES. ENTRY BY AUTHORIZED CARD OR KEY. ENTRY BY AUTHORIZED CARD WILL ACTIVATE SOLENOID IN THE LEVER AND ALLOW LEVER TO BE DEPRESSED. STANDARD FUNCTIONALITY FOR DOOR CONTACTS AND REQUEST TO EXIT. LOCK HAS MECHANICAL KEY OVERIDE. FREE EXIT AT ALL TIMES.

Set: 26.0

2	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Hinge - Electrified	TA2714 114mm x 102mm QC-4 (Middle) (ANSI A8112)	US26D	MK
1	Access Control Lock	DG1 63 64 91 IN120 82276 IP B LNL	26D	SA
1	Door Closer	1431 O (ANSI C02011)	EN	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Gasketing	S773BL x 3 Sides		PE
1	Power Supply	BPS-24, To Be Shared - Note in Misc Set	Std	SU
1	Certified Installer	Installation		00
1	Raceway Harness Wires W/Pins-3'0	93995-QC-C300P-QC12-12	Std	MK
1	Wiring Harness Wires W/Pins-15'0	93998-QC-1500P-QC12-12	Std	MK
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
WIRELESS LOCK TO BE HARDWIRED TO POWER SUPPLY.
REQUIRES 120VAC POWER TO POWER SUPPLY LOCATION BY ELECTRICAL CONTRACTOR.
REQUIRES LOW VOLTAGE FROM POWER SUPPLY TO ELECTRIFIED LOCK LOCATION.
REQUIRES LOW VOLTAGE AND COMMUNICATION WIRE BY ELECTRICAL CONTRACTOR.
REQUIRES CONDUIT TO BE SUPPLIED AND INSTALLED BY ELECTRICAL SUPPLIER.
REQUIRES WIRE AND WIRE PULL BY ELECTRICAL SUPPLIER.
REQUIRES WIRE CHASE IN THE DOORS.

MODE OF OPERATION:
DOOR TO BE SECURED AT ALL TIMES. ENTRY BY AUTHORIZED CARD OR KEY. ENTRY BY AUTHORIZED CARD WILL ACTIVATE SOLENOID IN THE LEVER AND ALLOW LEVER TO BE DEPRESSED. STANDARD FUNCTIONALITY FOR DOOR CONTACTS AND REQUEST TO EXIT. LOCK HAS MECHANICAL KEY OVERIDE. FREE EXIT AT ALL TIMES.

Set: 27.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Institutional Privacy Lock	DG1 LB 50 63 64 8267 LNL (ANSI F26)	US26D	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO

Set: 28.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Passage Set	8215 LNL (ANSI F01)	US26D	SA
1	Door Closer	1431 O (ANSI C02011)	EN	SA
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Gasketing	319CS x 3 Sides		PE

Set: 29.0

3	Hinge	TA2714 114mm x 102mm (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Door Closer	1431 O (ANSI C02011)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Gasketing	332CR x 3 Sides		PE
1	Door Bottom	420APKL x Door Width		PE

Set: 30.0

3	Hinge	TA2714 114mm x 102mm NRP (ANSI A8112)	US26D	MK
1	Storeroom Lock	DG1 63 64 8204 LNL (ANSI F07)	US26D	SA
1	Door Closer (surface)	421 CTB (Pull Side)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Door Position Switch (Triple Biased)	Supplied by Electrical, Frame prepared for concealed rectangular cut out	Std	SE
1	Wiring Diagrams	Wirung Diagrams (Elevations & Point to Point)	Std	SA

Notes:
DOOR CONTACT TO BE TIED TO BUILDING SECURITY SYSTEM.

Set: 31.0

1	Continuous Hinge	CFM x Height x SLF-HD1		PE
1	Exit Device	12 8813 ETL (Type 1, Function 08)	US32D	SA
1	Door Closer (surface)	421 CTB (Pull Side)	EN	SA
1	Kickplate	K1050 355mm x 25mm LDW (ANSI J102)	US32D	RO
1	Wall Stop	406 (Convex HD) (ANSI L02101)	US32D	RO
1	Gasketing	319CS x 3 Sides		PE

Set: 32.0

5	Key Charge	Master Keys (Per Group)		SA
5	Key Charge	Construction Master Keys		SA
5	Key Charge	Control Keys - Construction Cores		SA
1	Key Charge	Control Keys - Permanent Cores		SA
2	Key Charge	Extra Keys per Lock		SA
1	Key Charge	Visual Keying (Cylinder and Keys)		SA
200	Key Charge	Key Blanks		SA
1	Network and Lock Configuration Tool Kit	WFCD1		SA
500	Proximity Card	PCH-L30		SA
1	HID Vertex Main Controller	Vertx - CS, V1000	Std	SA
3	HID Vertex 2 Door Controller	Vertx V100 (2 Door Controller)	Std	SA
2	Persona Campus Online Software	1062-25/1 for up to 25 Locks	Std	SA
1	Persona on Line - Vertex 32 Readers	1062-16/1 Vertx 32 Readers	Std	SA
6	Power Supply	BPS-24-6		SU
6	Battery Backup	B-24-5		SU
1	Molex Hand Crimp Tool	94036-QC-R003	Std	MK
1	Extraction Tool	94035-QC-R002	Std	MK
1	Molex Service Repair Kit	94034-QC-R001	Std	MK
1	Wiegand Tester	WT1	Std	MK
5	Certified Installer	Installation		00
1	Certified Installer	Access Control Installation		00
1	Key Cabinet	TCA-234-S	Grey	TK

Notes:
LOCKS TO BE INSTALLED BY A CERTIFIED INTEGRATER. THERE WILL BE TWO CARD ACCESS SYSTEMS ON THIS PROJECT. ONE FOR THE STAFF AND ONE FOR THE RESIDENCE. THE STAFF ACCESS CONTROL TO BE SUPPLIED BY THE ELECTRICAL CONTRACTOR.
THE RESIDENT CARD ACCESS TO BE SUPPLIED BY THIS SECTION. THE HID VERTEX MAIN CONTROLLER AND TWO DOOR CONTROLLERS ARE REQUIRED FOR THE RESIDENCE POD DOORS WHICH HAS BOTH THE STAFF AND RESIDENT CARD ACCESS ON IT.
POWER SUPPLIES CAN BE CONSOLIDATED WITH COORDINATION
WITH THE ELECTRICAL SUPPLIER.

Door Index

Opening Numbers	Heading Numbers
X100	1.0
X105	3.0
X110	5.0
X118	5.0
XA105	4.0
001	30.0
003	15.0
004	13.0
005	17.0
006	16.0
007	30.0
008	13.0
009	23.0
010	17.0
011	14.0
012	14.0
013	19.0
014	18.0
015	18.0
100	2.0
102	23.0
103	23.0
104	17.0
106	10.0
107	13.0
109	22.0
110	31.0
111	9.0
112	15.0
114	22.0

Opening Numbers	Heading Numbers
115	22.0
116	17.0
118	31.0
202	31.0
203	13.0
204	22.0
205	22.0
206	31.0
207	12.0
208	15.0
209	20.0
210	11.0
211	17.0
A100	24.0
A101	7.0
A102	7.0
A103	7.0
A104	7.0
A105	6.0
A106	6.0
A107	7.0
A108	23.0
A110	21.0
A111	21.0
A112	8.0
A113	15.0
B100	23.0
B103	7.0
B104	7.0
B105	7.0

Opening Numbers	Heading Numbers
B106	7.0
B107	7.0
B108	7.0
B109	15.0
B110	6.0
B111	7.0
B112	7.0
B114	21.0
B115	21.0
B200	25.0
B203	26.0
B204	26.0
B205	26.0
B206	26.0
B207	26.0
B208	26.0
B209	26.0
B210	26.0
B211	27.0
B212	27.0
B213	29.0
B214	28.0
C100	25.0
C103	26.0
C104	26.0
C105	26.0
C106	26.0
C107	26.0
C108	26.0
C109	26.0

Door Index

Opening Numbers	Heading Numbers
C110	26.0
C111	27.0
C112	27.0
C113	29.0
C114	28.0
C200	25.0
C203	26.0
C204	26.0
C205	26.0
C206	26.0
C207	26.0
C208	26.0
C209	26.0
C210	26.0
C211	27.0
C212	27.0
C213	29.0
C214	28.0
D100	25.0
D103	26.0
D104	26.0
D105	26.0
D106	26.0
D107	26.0
D108	26.0
D109	26.0
D110	26.0
D111	27.0
D112	27.0
D113	29.0

Opening Numbers	Heading Numbers
D114	28.0
D200	25.0
D203	26.0
D204	26.0
D205	26.0
D206	26.0
D207	26.0
D208	26.0
D209	26.0
D210	26.0
D211	27.0
D212	27.0
D213	29.0
D214	28.0
Misc	32.0

Opening Numbers	Heading Numbers

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

.1 Comply with requirements of Division 1.

1.2 RELATED SECTIONS

.1 Section 08 11 10: Hollow Metal Doors and Frames.

.2 Section 08 11 16: Aluminum Doors and Frames.

.3 Section 08 14 00: Wood Doors.

.4 Section 08 34 73: Sound Control Door Assemblies.

.5 Section 08 44 13: Glazed Aluminum Curtain Wall.

.6 Section 08 51 13: Aluminum Windows.

.7 Section 08 54 13: Fiberglass Windows.

.8 Section 10 28 13: Washroom Accessories.

1.3 REFERENCES

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

.2 CAN/CGSB-12.1 Tempered or Laminated Safety Glass.

.3 CAN/CGSB-12.3 Flat, Float Glass

.4 CAN/CGSB-12.4 Heat Absorbing Glass.

.5 CAN/CGSB-12.5 Mirrors, Silvered.

.6 CAN/CGSB-12.8 Insulating Glass Units.

.7 CAN/CGSB-12.9 Spandrel Glass.

.8 CAN/CGSB-12.10 Glass, Light and Heat Reflecting.

.9 CAN/CGSB-12.11 Wired Safety Glass.

.10 Flat Glass Manufacturer's Association (FGMA) Glazing Manual.

.11 CCD-045, Sealants and Caulking – Environmental Choice Program (ECP).

1.4 PERFORMANCE REQUIREMENTS

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

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads acting normal to plane of glass to a design pressure of as measured in accordance with ANSI/ASTM E330.

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

1.5 SUBMITTALS

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

.2 Submit two copies of WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 29 – Health and Safety Requirements. Indicate VOC's for glazing materials during application and curing.

.3 Shop Drawings: Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.4 Samples: Submit samples in accordance with Section 01 33 00 - Submittal Procedures. Submit 300 mm x 300 mm size samples of insulating glazing units.

.5 Manufacturer's Instructions: Submit manufacturer's installation instructions.

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

1.6 QUALITY ASSURANCE

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

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

.3 Tempered glass identification must be sandblasted into glass and shall be visible after installation.

1.7 **ENVIRONMENTAL REQUIREMENTS**

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

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

1.8 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

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

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

.4 Divert unused caulking and sealant materials from landfill through disposal at special wastes depot.

1.9 **WARRANTY**

.1 At no cost to Departmental Representative, replace factory sealed insulating window units should cracking of glass or any other breakdown or failure of glass unit occur or should obstruction of vision develop due to dust or film forming on inner glass surfaces within a period of five (5) years from date of Substantial Performance.

PART 2 - PRODUCTS

2.1 **MATERIALS: FLAT GLASS**

.1 Float Glass: to CAN/CGSB-12.3, glazing quality, 6 mm thick.

.2 Safety Glass (tempered): to CAN/CGSB-12.1, tempered glass, type 2, Class B, 6 mm thick.

.3 Wired Glass: to CAN/CGSB-12.11, type 1, wire mesh style 3 (square), 6 mm thick.

.4 Low Emissivity (LOW E) glass: to CAN/CGSB-12.10, low-E coating on clear tempered glass, 6 mm thick.
- .1 Light transmittance: 70.
- .2 Shading co-efficient: 0.45.
- .3 U-Value (Imperial): winter night-time 0.29 / summer daytime 0.27.
- .4 Acceptable product:
  - .1 Solarban 60 Low E.
  - .2 or approved equal.

.5 Silvered Mirror Glass: to CAN/CGSB-12.5, type 3C – film reinforced, 6 mm thick.

.6 Decorative Window Film: translucent, polyester film for decorative use, with mounting adhesive on one side and abrasion resistant coating on the other. Acceptable product: Fasara, Milky Way by 3M, or equivalent product by other manufacturers.

2.2 **MATERIALS: SEALED INSULATING GLASS**

.1 Insulating glass units (IG) – Type 1: aluminum curtain wall: factory sealed units to CAN/CGSB-12.8, double unit, nominal 25 mm overall thickness.
- .1 Glass: to CAN/CGSB-12.1; 12.4; 12.10 and 12.13 – see insulating glass units descriptions.
- .2 Glass thickness: 6 mm inner light, 6 mm outer light.
- .3 Inter-cavity space thickness: 13 mm with black, low conductivity spacer.
- .4 Glass coating: low “E” on third surface (exterior surface of inner light).
- .5 Inert gas fill: Argon.
- .6 Insulating glass units:
  - .1 IG: Outer light – to CAN/CGSB-12.4, tempered, clear, 6 mm thick. Inner light - to CAN/CGSB-12.10, low-E coating on clear tempered glass, third surface, 6 mm thick.
    - .1 Light transmittance - visible: 70%.
    - .2 Shading co-efficient: 0.45.
    - .3 Solar heat gain coefficient: 0.45.
    - .4 U-Value (Imperial): winter 0.29 (night-time), summer 0.27 (daytime).
    - .5 U-Value (metric): 1.6

.2 Insulating glass units (IG) – Type 2: aluminum and fiberglass windows: factory sealed units to CAN/CGSB-12.8, **triple unit**, nominal 40 mm overall thickness.
- .1 Glass: to CAN/CGSB-12.1; 12.4; 12.10 and 12.13 – see insulating glass units descriptions.
- .2 Glass thickness: 6 mm inner light, 6 mm centre light, 6 mm outer light.
- .3 Inter-cavity space thickness: 12 mm with black, low conductivity spacer for triple-glazing.
- .4 Glass coating: low “E” on third surface (exterior surface of inner light).
- .5 Inert gas fill: Argon.
- .6 Insulating glass units:
  - .1 Light transmittance - visible: 63%.
  - .2 Solar heat gain coefficient: 0.44.
  - .3 U-Value (Imperial): winter 0.21
  - .4 U-Value (metric): 1.18

2.3 **GLAZING AND SEALING COMPOUNDS**

.1 Sealant: as specified in Section 07 92 00 – Joint Sealing.

.2 Heel bead: as specified in Section 07 92 00 – Joint Sealing.

.3 Cap bead compound: as specified in Section 07 92 00 – Joint Sealing.

2.4 **ACCESSORIES**

.1 Setting blocks: Neoprene, 80 - 90 Shore A durometer hardness to ASTM D 2240, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene, 50-60 points 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: Preformed butyl compound with integral resilient tube spacing device, 10 - 15 Shore A durometer hardness to ASTM D 2240; coiled on release paper; sized to suit; black colour.

.4 Glazing splines: resilient PVC, extruded shape to suit glazing channel retaining slot, colour to match adjacent material.

.5 Lock-strip gaskets: to ASTM C542.

.6 Primer - sealers and cleaners: to glass manufacturer’s standard.

.7 Window treatment films.

PART 3 - EXECUTION

3.1 **MANUFACTURER’S INSTRUCTIONS**

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

3.2 **EXAMINATION**

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

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

3.3 **PREPARATION**

.1 Clean and prime surfaces scheduled to receive sealant in accordance with sealant manufacturers recommendations. Use solvents and cleaning agents recommended by manufacturer of sealing materials.

.2 Clean contact surfaces with solvent and wipe dry.

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

.4 Prime surfaces scheduled to receive sealant.

3.4 **GLASS INSTALLATION GENERAL**

.1 Provide clearance at perimeter edge of glass on all four sides, minimum equal to glass thickness.
  .1 Accurately cut glass to fit openings, allowing for expansion in accord with glass manufacturer's recommendations.
  .2 Provide sealer space between face of glass and glazing stops of minimum 3 mm.

.2 Set glass on setting blocks, spaced as recommended by glass manufacturer. Provide at least one setting block at quarter points from each corner.

.3 Centre glass in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centred position of glass in rabbet and provide the required sealer thickness on both sides of glass.

.4 On interior hollow metal screens, locate glass and glazing stops on “secure” side of frame (i.e. to interior of room side).

.5 Carefully remove glazing stops and reinstall after glazing.

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

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

.2 Cut glazing tape to length and set against permanent stops, 3 mm below sight line. Seal corners by butting tape and dabbing with sealant.

.3 Apply heel bead of 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 ¼ points, with edge block maximum 150 mm from corners.

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

.6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape 3 mm below sight line.

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

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

3.6 **INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)**

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

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

.3 Place setting blocks at ¼ points, with edge block maximum 150 mm from corners.

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

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

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

.7 Knife trim protruding tape.

3.7 **INSTALLATION: DECORATIVE FILM**

.1 Install adhesive decorative film, applied in accordance with film manufacturer's instructions

.2 Clean and dry all glazed surfaces to receive decorative window film before commencing application.

.3 Apply film without air bubbles, creases or visible distortion, to room side of glazing.

3.8 **CLEANING**

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

.2 Remove dust, dirt, sealant, plaster, paint spatter, and other harmful and deleterious matter from glass promptly and completely, before they establish tight adhesion.

.3 Remove glazing materials promptly from finish surfaces as the work progresses. Remove traces of primer and caulking.

.4 Remove labels after work is complete.

.5 Clean glass and mirrors using approved non-abrasive cleaner in accordance with manufacturer's instructions. Avoid using abrasives, steel wool razor blades, solvents alkaline or other harsh cleaning agents.

.6 Replace chipped, broken, scratched or otherwise damaged glass.

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

3.9 **PROTECTION OF FINISHED WORK**

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

3.10 **SCHEDULE**

.1 Provide glazing for the following elements and components:
- .1 Windows, curtain wall, doors and entrances.
- .2 Exterior and interior doors and sidelights.
- .3 Interior hollow metal screens.
- .4 Other glazing shown on drawings prepared and not covered in other Sections.

.2 Provide the following glass:
- .1 Insulating double glazed sealed units: curtain wall, entrances and exterior doors.
- .2 Insulating triple glazed sealed units: aluminium windows, fibreglass windows.
- .3 Wired glass: at fire rated locations and where shown.
- .4 Tempered safety glass: interior doors and door sidelights, and interior hollow metal screens.

.3 Apply window treatment film to glazing at screens at the following locations:
- .1 Screen S1 – Director's Office (A101),
- .2 Screen S2 – Reception (B100)
- .3 Screen S4 – Program Room #1 (111)
- .4 Screen S6 – Security Office (103)

END OF SECTION

PART 1 - GENERAL

1.1 GENERAL

.1 Comply with requirements of Division 1.

1.2 RELATED WORK

.1 Section 07 27 26: Fluid Applied Membrane Air Barrier.

.2 Section 07 42 43: Composite Metal Wall Panels.

.3 Section 07 62 00: Sheet Metal Flashings and Trim.

.4 Section 07 92 00: Joint Sealing.

.5 Section 08 44 13: Glazed Aluminum Curtain Wall.

.6 Division 23: Heating Ventilation and Air Conditioning (HVAC).

1.3 REFERENCES

.1 AAI DAF-45-2003(R2009), Designation System for Aluminum Finishes - Aluminum Association Inc. (AAI).

.2 ASTM A653/A653M - 11, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

.3 ASTM B209 -10, Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

1.4 PERFORMANCE REQUIREMENTS

.1 Deflection: louvre members shall deflect not more than 1/180 of span between supports when subjected to wind load of 1 kPa applied horizontally to louvre blade.

.2 Louvres shall provide for nominal 50% free area.

.3 Vibration: louvre members shall not vibrate or rattle.

1.5 ACTION AND INFORMATION SUBMITTALS

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

.2 Product Data:
  .1 Submit manufacturer's printed product literature, specifications and datasheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:
  .1 Submit shop drawings in accordance with Section 01 33 00-Submittal Procedures.

.2 Indicate fabrication and erection details, including anchorage, accessories, and finishes.

.4 Samples:
- .1 Submit samples in accordance with Section 01 33 00 – Submittal Procedures.
- .2 Submit samples of louvre blade, frame, screening and finish.

.5 Quality Assurance Submittals: submit following in accordance with Section 01 45 00 – Quality Control.
- .1 Instructions: submit manufacturer's installation instructions and special handling criteria, installation sequence and cleaning procedures.

1.6 **DELIVERY, STORAGE AND HANDLING**

.1 Packing, shipping, handling and unloading:
- .1 Deliver, store and handle in accordance with Section 01 61 00 – Common Product Requirements.
- .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
- .3 Deliver materials to the site in undamaged condition.

.2 Storage and Protection:
- .1 Store materials off ground and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
- .2 Protect louvers from nicks, scratches and blemishes.
- .3 Replace defective or damaged materials with new.

1.7 **WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 21 - Construction Waste Management and Disposal.

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

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

.4 Divert metal cut-offs from landfill by disposal into on-site metal recycling bin.

.5 Divert uninstalled materials for reuse at nearest used building materials facility or similar type facility.

.6 Fold up metal banding, flatten and place in designated are for recycling.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Anodized aluminum extrusions: Aluminum Association alloy AA6063-T5.

.2 Galvanized steel sheet: commercial quality to ASTM A653/A653M with Z275 zinc coating.

.3 Fasteners: same material as fabricated items.

.4 Extruded aluminum louvre (Type 1): stationary, mullion type louvre with 3 mm thick blades, 177 mm deep with “storm resistant” blades, aluminum bird screen and blank-off panels as required. Finish: clear anodized aluminum.

.1 Acceptable products:

.1 Model # RS 7315 Architectural Mullion Louvres by Construction Specialties.

.2 Model EME 745 Wind Driven Rain Resistant Stationary Louver by Ruskin Company.

.3 Equivalent product by E.H.Price, M.W. McGill, Airolite.

.4 or approved equal.

.5 Screens (Birdscreen): 12 mm size mesh, 1.5 mm double crimped aluminum wire cloth secured to 2.2 mm thick extruded aluminum frame mitered at corners and secured with corner locks.

.6 Blank-off panels: 50 mm thick, with 0.81 mm thick aluminum face sheets both sides of panels with expanded polystyrene (EPS) core, R=8 minimum. Panel perimeter frame: 1.27 mm thick, formed aluminum channels with mitered corners. Finish panels to match louvers.

.7 Sill extensions: formed aluminum, depth and profile to suit continuous horizontal sill flashing condition. Concealed clip anchor, drip deflector at sill ends.

2.2 FABRICATION

.1 Construct louvres from aluminum extrusions and/or galvanized steel sections to sizes and shapes indicated.

.2 Arrange blades, mullions and frame extrusions as indicated.

.3 Install concealed vertical stiffeners spaced to meet required loads.

.4 Complete louvre assembly to have 45% free area.

2.3 FINISHES

.1 Aluminum components: finish exposed surfaces of aluminum louvres in accordance with Aluminum Association Designation System for Aluminum Finishes - 1980.

.1 Anodized finish: designation AA-M12 C22A44, Class 1, with a minimum coating thickness of 0.7 mils. Colour: clear anodized.

.2 Formed components such as closures, trim etc. shall be formed prior to finishing.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install louvres where shown on drawings.

.2 Install louvres plumb and level and securely fasten to adjacent building elements.

.3 Space mullions as required to keep louvre blades within specified deflection limit.

.4 Dissimilar metals and metals in contact with cementitious elements shall have contact surfaces coated with bituminous paint or other means approved by Departmental Representative.

.5 Attach bird screen to inside face of louvres.

.6 Repair damage to louvres to match original finish.

.7 Install wall louvers using flanges, brackets, jamb fasteners as appropriate for wall construction and in accordance with manufacturer's recommendations.

.8 Install blank-off panels over unused portion(s) of louvers as required (See mechanical drawings).

3.2 CLEANING

.1 Proceed in accordance with Section 01 74 11 – Cleaning.

.2 On completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

3.3 PROTECTION

.1 Where aluminium contacts metal other than zinc, paint dissimilar metal with primer and two coats of aluminium paint.

.2 Paint metal in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

3.4 SCHEDULE

.1 Install louvres where indicated on drawings.

Louvre No.	Room No.	Room Name	Size: W x H x D	Material/ Finish	Remarks
LV - 1	201	Socialization/ Activity	4340 W x 900 H x 171 D	Alum. / clear anodized	-
LV - 2	200	Common Area / Corridor	2050 W x 900 H x 171 D	Alum. / clear anodized	

END OF SECTION