PART 1 - GENERAL

1.1 REFERENCES

.1 American Society for Testing and Materials (ASTM):
- .1 ASTM A653/A653M-15e1, Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .2 ASTM C578-15b, Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

.2 Canadian Steel Door Manufacturers' Association, (CSDMA):
- .1 CSDMA, Specifications for Commercial Steel Doors and Frames, 2006.
- .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 2009.

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

.4 National Fire Protection Association (NFPA):
- .1 NFPA 252, Fire Tests of Door Assemblies, 2017
- .2 NFPA 80, Fire Doors and Other Opening Protectives, 2016.

.5 Underwriters' Laboratories of Canada (ULC):
- .1 CAN/ULC S104-10, Method for Fire Tests of Door Assemblies.
- .2 CAN/ULC S105-16, Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.

1.2 DESIGN REQUIREMENTS

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

.2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.3 SHOP DRAWINGS

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

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

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

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

.5 Submit test and engineering data, and installation instructions.

1.4 SAMPLES

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

.2 Submit one 300 x 300 mm top corner sample of each type door.

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

1.5 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 CAN/ULC-S104, NFPA 252 for ratings specified or indicated.

.2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN/ULC-S104 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.

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Place materials defined as hazardous or toxic waste in designated containers, and place used sealant and adhesive tubes and containers in areas designated for hazardous waste.

.3 Separate corrugated cardboard in accordance with the Waste Management Plan and place in designated areas for recycling.

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

.5 Collect wood packing shims and pallets and place in designated area for recycling and reuse.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts.

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

.3 Exterior doors to be stiffened with internal welded framing.

2.2 DOOR CORE MATERIALS

.1 Standard Interior - Honeycomb:

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

.2 Standard Exterior - Polystyrene:

.1 Rigid extruded fire retardant, closed cell board. Density; 16 to 32 kg/m3 (1 to 2 pcf), thermal values; RSI 1.0 (R 6.0) minimum, Type 1, in accordance with ASTM C578. Stiffened, face sheets laminated.

2.3 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.

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

2.4 PAINT

.1 Refer to Section 09 91 00 Painting.

2.5 ACCESSORIES

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

.2 Exterior and interior top and bottom fitted with vinyl cap. Provide weep holes in bottom closure channel of all exterior doors.

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

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

.5 Fire labels: metal riveted.

.6 Sealant: as per Section 07 92 00.

.7 Glazing: as per Section 08 80 00.

.8 Make provisions for glazing as indicated and provide necessary glazing stops.
- .1 Provide removable stainless steel glazing beads for use with glazing tapes and compounds and secured with countersunk stainless steel screws dry glazing of snap-on type.
- .2 Design exterior glazing stops to be tamperproof.

2.6 FRAMES FABRICATION GENERAL

.1 Fabricate frames in accordance with CSDFMA specifications.

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

.3 Exterior frames: 16 gauge welded thermally broken type construction.

.4 Interior frames: 16 gauge welded type construction.

.5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.

.6 Protect mortised cutouts with steel guard boxes.

.7 Prepare frame for door silencers, three (3) for single door, two (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 polyurethane insulation.

.12 Size the frame head width in concrete masonry construction, for door height vs coursing height.

2.7 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.

2.8 FRAMES: WELDED TYPE

.1 Welding in accordance with CSA W59.

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

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

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

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

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

.7 Securely attach lead to inside of frame profile from return to jamb soffit on door side of frame only.

2.9 DOOR FABRICATION GENERAL

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

.2 Exterior doors: insulated steel stiffened construction. Interior doors: honeycomb construction.

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

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

.5 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.

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

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

.8 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN/ULC-S104 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.

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

2.10 HOLLOW STEEL CONSTRUCTION

.1 Form each face sheet for exterior doors from 18 gauge sheet steel.

.2 Form each face sheet for interior doors from 18 gauge sheet steel.

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

.4 Fill voids between stiffeners of exterior doors with polyurethane core.

2.11 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

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

PART 3 - EXECUTION

3.1 INSTALLATION GENERAL

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

.2 Install doors and frames to CSDFMA Installation Guide, or otherwise where required by the National Building Code of Canada (2010 Edition).

3.2 FRAME INSTALLATION

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

.2 Secure anchorages and connections to adjacent construction.

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

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

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

.6 Provide a 200 mm wide strip or air/vapour barrier material (as per requirements of Section 07 27 00) mechanically fastened with 1.2 mm galvanized bar, to be tied into surrounding Air Vapour barriers.

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, top of carpet noncombustible sill and thresholds: 13 mm.

.3 Adjust operable parts for correct function.

.4 Install louvers.

3.4 FINISH REPAIRS

.1 Touch up with primer finishes damaged during installation.

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

3.5 GLAZING

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

END

PART 1 - GENERAL

1.1 REFERENCES

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

.2 American Architectural Manufacturers Association (AAMA).
- .1 AAMA 609-15, Voluntary Guide Specification for Cleaning and Maintenance of Architectural Anodized Aluminum.

.3 American National Standards Institute / Building Hardware Manufacturers Association:
- .1 ANSI/BHMA A156.10-2011 Power operated pedestrian doors.

1.2 QUALITY ASSURANCE

.1 Manufacturer’s Qualifications:
- .1 Products specified shall be represented by a factory authorized and trained distributor. Distributor shall maintain a parts inventory and trained service personnel capable of providing service to the locale as installation of this contract.

.2 All automatic equipment to comply with ANSI A156.10

1.3 SUBMITTALS

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

1.4 SHOP DRAWINGS

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

.2 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.

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

.4 Provide shop drawings for automatic door openers.

1.5 CLOSEOUT SUBMITTALS

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

1.6 DELIVERY, STORAGE AND HANDLING

.1 Storage and Protection:
- .1 Apply temporary protective coating to finished surfaces. Remove coating after erection. Do not use coatings that will become hard to remove or leave residue.
- .2 Leave protective covering in place until final cleaning of building.

1.7 WASTE MANAGEMENT AND DISPOSAL

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

PART 2 - PRODUCTS

2.1 INTERIOR FRAME MATERIAL

.1 Aluminum extrusions: Aluminum Association alloy AA 6063-T5 anodizing quality. Thickness 3 mm.

.2 Sheet aluminum: Aluminum Association alloy anodizing quality to match extrusions. Thickness 2 mm.

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

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

.5 Sealants: as per Section 07 92 00.

.6 Door frame based on Kawneer Trifab 400 Series.

.7 Acceptable Manufacturers:
- .1 Kawneer
- .2 Anotec
- .3 Alumicor

2.2 ALUMINUM DOORS & HARDWARE

.1 Aluminum Doors:
- .1 Construct doors of portable extrusions with minimum wall thickness of 3 mm
- .2 Door styles approximately 150 mm wide
- .3 Top rail approximately 200 mm wide
- .4 Bottom rail approximately 200 mm wide
- .5 Reinforce mechanically joined corners of doors to produce sturdy door unit
- .6 Glazing stops: interlocking snap in type for dry glazing
- .7 Door based on Kawneer 350 Series
- .8 Approved manufacters:
  - .1 Alumicor
  - .2 PPG
  - .3 Kawneer
  - .4 Anotec

.2 Hardware:
- .1 Refer to Section 08 71 00.

2.3 GLAZING

.1 Refer to Section 08 80 00 Glazing for standard frame to glass glazing.

.2 Refer to Section 08 80 00 Glazing for structural sealed glazing for vertical joints, refer to 07 92 00 Joint Sealants and drawings for location.

2.4 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. Conceal fastenings.

.5 Mortise, reinforce, drill and tap doors, frames and reinforcements to receive hardware.

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

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 INSTALLATION– STANDARD ALUMINUM FRAMING AND ALUMINUM DOOR

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

.2 Anchor securely.

.3 Install doors and hardware in accordance with manufacturer.

.4 Adjust operable parts for correct function.

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

3.3 INSTALLATION ALUMINUM FRAME BASE AND HEAD, WITH STRUCTURAL SEALED GLAZING BUTT JOINTS, VERTICALLY

.1 Install head and sill with deflection space required at the head.

.2 Install door and hardware in accordance with manufacturer's recommendations.

.3 Install structural sealed glazing units in accordance with manufacturer's recommendations and as per Section 08 80 00.

3.4 GLAZING

.1 Glaze aluminum doors and frames in accordance with Section 08 80 00 - Glazing.

3.5 SEALANT

.1 As per Section 07 92 00.

3.6 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 of Work with Contract.

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

END

PART 1 - GENERAL

1.1 REFERENCES

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC).
- .1 Architectural Woodwork Standards, current edition.

.2 Canadian Standards Association CSA International.
- .1 CAN/CSA O132.2 Series-90(R1998), Wood Flush Doors.

.3 National Fire Protection Association (NFPA).
- .1 NFPA 252, Fire Tests of Door Assemblies, 2017

.4 Underwriters' Laboratories of Canada (ULC).
- .1 CAN/ULC S104-10, Method for Fire Tests of Door Assemblies
- .2 CAN/ULC S105-16, Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.

1.2 SHOP DRAWINGS

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

.2 Indicate door types and cutouts for lights and louvers, sizes, door construction, core, glazing detail and faces.

1.3 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 wood door.

1.4 REGULATORY REQUIREMENTS

.1 Wood fire rated doors: NFPA 252 Rating.

1.5 STORAGE AND PROTECTION

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

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

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

1.6 WASTE MANAGEMENT AND DISPOSAL

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

.2 Dispose of all packaging material in appropriate on-site bin for recycling in accordance with site waste management program.

PART 2 - PRODUCTS

2.1 WOOD FLUSH DOORS

.1 Solid core flush wood doors: to CAN/CSA-O132.2.1.

.2 Construction:
- .1 Rails & Stiles:
  - .1 Minimum 25 mm bonded hardwood, both inner and outer bands. Manufactured to ASTM D5456. Lifetime anti-warping warranty.
  - .2 Total Width stile: 105 mm
  - .3 Total Width rail: 84 mm
  - .4 Finish to match door faces.
- .2 STC Rating: Coordinate with Door Hardware for assembly STC rating
- .3 Core:
  - .1 Solid particle board, 449 kg/cubic metre, bonded and sanded
- .4 Veneer Face Panels:
  - .1 Hardwood; veneer grades: Grade I for painted finish, Birch wood veneer.
- .5 Adhesive:
  - .1 Type II (water resistant) for interior doors, NAUF.
- .6 Finish:
  - .1 Refer to Section 09 91 00.
- .7 Door description based on Baillargeon 8500-ME particleboard heavy duty door.
- .8 Acceptable Manufacturers:
  - .1 Baillargeon
  - .2 Masonite
  - .3 Boccam
  - .4 Lambton

2.2 FIRE RATED WOOD DOORS

.1 Wood doors: tested in accordance with NFPA 252 to achieve rating as indicated.

.2 45/60 Minute FRR Door, agrifibre core.
- .1 Door Faces:
  - .1 Type 1: 3 mm wood veneer, 3-ply plywood, Birch, paint grade finish, factory primed.
  - .2 Finish: Colour and sheen to be selected from full colour range.
- .2 Door Core: Agrifibre

.3 Rails and Styles:
.1 Minimum 25 mm bonded hardwood, both inner and outer bands.
.2 Manufactured to ASTM D5456
.3 Finish on hardwood to match door faces.
.4 Total width stile: 105 mm, total width rail: 84 mm
.4 STC Rating: Coordinate with Door Hardware for assembly STC rating
.5 Door description based on AF 8500 Neutral Pressure (5 ply) Agrifibre door.
.6 Acceptable Manufacturers:
.1 Baillargeon AF 8500 Neutral Pressure (5-ply) Agrifibre core door.
.2 Masonite
.3 Boccam
.4 Lambton

2.3 GLAZING

.1 As per Section 08 80 00.

2.4 FABRICATION

.1 Vertical edge strips to match face veneer.

.2 Prepare doors for louvers and glazing. Provide hardwood species, glazing stops 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 Radius vertical edges of double acting doors to 60 mm radius.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify that opening sizes and tolerances are acceptable.

.2 Door frames to be plumb and true before doors are installed. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INTERFACE WITH OTHER SYSTEMS

.1 Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.

.2 Provide solid blocking for through bolted hardware.

.3 Provide lock blocks at lock edge and top of door for closer and for hardware reinforcement.

.4 Factory Preparation for Light Openings and Louvers: Cut and trim openings through doors to comply with NFPA 80 requirements where indicated; maintain door manufacturer's warranty.

.5 Coordinate installation of glass and glazing.

.6 Provide edge clearances in accordance with AWMAC standards.

3.3 INSTALLATION

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

.2 Install labelled fire rated doors to NFPA 80.

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

.4 Adjust hardware for correct function.

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

3.4 ADJUSTMENT

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

END

PART 1 - GENERAL

1.1 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

.2 American Society for Testing and Materials International (ASTM):
- .1 ASTM B117-11, Standard Practice for Operating Salt Spray (Fog) Apparatus

.3 National Fire Protection Association (NFPA):
- .1 NFPA 80 Standard for Fire Doors and Fire Windows.

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

.5 National Building Code of Canada (NBC), 2010

1.2 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, including installation instructions, MSDS sheets, specifications and data sheets in accordance with Section 01 33 00 Submittal Procedures.
- .2 Closeout Submittals: provide operation and maintenance data for shutters and hardware for incorporation into manual specified in Section 01 78 00 Closeout Submittals.
- .3 Product Data: Manufacturer’s data sheets on each product to be used, including:
  - .1 Preparation instructions and recommendations.
  - .2 Storage and handling requirements and recommendations.
  - .3 Details of construction and fabrication.
  - .4 Installation methods.

.2 Samples:
- .1 Selection Samples: For each finish product specified, two complete sets of colour chips representing manufacturer's full range of available colours and patterns.

.3 Shop Drawings:
- .1 Shop Drawings: Indicate each type of shutter, rating of shutter, detailed plans and elevations, arrangement of hardware, operator and required clearances. Site conform exact measurements and required structural support as required is in place before incorporating notes into shop drawings submitted for review.
- .2 Shop drawings also to indicated securement to structure.

1.3 FIRE SHUTTER

.1 Fire Rated Assembly. Provide Fire Rated assembly complying with NFPA 80 and listed in HLC Direction or Intertek Services Warnoch Hersey listed Director.

1.4 WASTE MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 74 19 Construction Waste Management and Disposal (LEED) and Construction Waste Management Plan.

.1 A Waste Trip Log Form must be completed and submitted for all waste material removed from site.

.2 Weigh bills from receiving facilities, which support the Waste Trip Log Form, must also be submitted.

1.5 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Deliver and store materials in compliance with Section 01 61 00 Common Product Requirements.

.2 Comply with manufacturer’s recommendations for handling, storage and protection during installation.

.3 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.4 Label packages to include material name, production date and/or product code.

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

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

1.6 QUALITY ASSURANCE/QUALITY CONTROL

.1 Manufacturer's representative must review the final installed product.

.2 Conform to requirements of NBC for accessibility.

.3 Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five (5) years of experience.

.4 Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum five (5) years and approved by manufacturer

1.7 EXTENDED WARRANTY

.1 Provide a two (2) year manufacturer's warranty for materials and two year (2) warranty for installation against defects.

PART 2 - PRODUCTS

2.1 FIRE-RATED SHUTTER WITH DRAFT CURTAIN

.1 Coiling counter model Electric Operated.
- .1 Refer to drawings for locations, quantity and exact opening sizes. Confirm exact size on drawings and on site.
- .2 Wall Installation: refer to drawings.
- .3 Curtain Construction: interlocking roll formed slats, with end locks attached to each end of alternate slats to prevent lateral movement.
  - .1 Fire Resistant rated as per drawings, notation and location.
  - .2 22 Gauge
  - .3 powder coat finish on galvanized steel to ASTM B117
  - .4 Color selected by Consultant from standard colour selection.
  - .5 Slats: 56 mm high by 16 mm deep
- .4 Bottom Bar: tubular extruded aluminum measuring 33 mm deep by 56 mm high, powder coat finish.
- .5 Brackets: 3 mm thick steel plate, powder coat finish.
- .6 Barrel: steel tubing, not less than 100 mm in diameter c/w oil tempered torsion springs capable of correctly counter balancing the weight of the curtain with maximum deflection to 0.8 mm (.03") per foot of opening width. Springs adjusted by means of an exterior wheel. The finish on the barrel shall be one (1) coat of bronze rust-inhibiting prime paint.
- .7 Hood: 24 gauge galvanized steel, formed to fit the curvature of the brackets with waterproof baffle to control air infiltration, powder coat finish.
- .8 Guides: extruded aluminum, 44 mm square, powder coat finish.
- .9 Electric motor as per manufacturing recommendations.
- .10 Operating Standard: designed to max. standard of 25 cycles per day and an overall maximum of 50,000 operating cycles for the life of the door.
- .11 Lock: Cylinder lock for electric operation with interlock switch. Cylinder lock supplied by Door Hardware Section 08 71 00. Keying to Departmental Representatives requirements.
- .12 Description based on Wayne Dalton Commercial Grade Model 500
- .13 Complete with Draft System flexible Baffle.
- .14 Acceptable alternate manufacturers:
  - .1 Wayne Dalton
  - .2 Cookson
  - .3 CHI Rolling Steel Doors

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine supports and other conditions under which shutters are to be installed.

.2 Site preparations are to be detailed by approved shop drawings.

.3 Verify opening dimensions by actual site measurements.

.4 Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

.5 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2 PREPARATION OF SUBSTRATE

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INTERFACE WITH OTHER SYSTEMS

.1 Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

.2 Coordinate with miscellaneous steel supports for shutter hoods.

.3 Coordinate with Door Hardware Section 08 71 00 for master keyed cylinder lock at counter shutter.

3.4 INSTALLATION

.1 Install doors to opening indicated and in accordance with manufacturer’s written instructions and approved shop drawings.

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

.3 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

.4 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

.5 Fit and align assembly including hardware; level and plumb, to provide smooth operation.

.6 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 92 00 Joint Sealants.

.7 Install perimeter trim and closures.

3.5 PROTECTION DURING WORK

.1 Protect installed products until completion of project.

3.6 ADJUSTMENT

.1 Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

.2 Demonstrate proper operation procedures to Departmental Representative's representative.

.3 Instruct Departmental Representative's representative in maintenance procedures.

3.7 CLEANING

.1 Clean all parts of assembly soiled by work as recommended by manufacturer.

.2 Remove surplus materials, packaging and debris from the site.

.3 Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

.4 Remove labels and visible markings.

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

END

PART 1 - GENERAL

1.1 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

.2 American Society for Testing and Materials International (ASTM):
- .1 ASTM A653/A653M-15, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
- .2 ASTM A924/A924M-14, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

.3 Association of Electrical Equipment and Medical Imaging Manufacturers (NEMA):
- .1 NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum).
- .2 NEMA MG1 - Motors and Generators Publication.

.4 National Fire Protection Association (NFPA):
- .1 NFPA 80 Standard for Fire Doors and Fire Windows.

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

1.2 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, MSDS sheets, specifications and data sheets in accordance with Division 01, Submittal Procedures.
- .2 Closeout Submittals: provide operation and maintenance data for shutters and hardware for incorporation into manual specified in Division 01, Closeout Submittals.
- .3 Product Data: Manufacturer’s data sheets on each product to be used, including:
- .4 Preparation instructions and recommendations.
- .5 Storage and handling requirements and recommendations.
- .6 Details of construction and fabrication.
- .7 Installation methods.

.2 Manufacturer's Information:
- .1 Submit manufacturer's installation instructions.

.3 Samples:
- .1 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- .2 Verification Samples: For each finish product specified, two samples, minimum size 6” square, representing actual product, color, and patterns.

.4 Shop Drawings:

.1 Shop Drawings: Indicate each type of shutter, rating of shutter, detailed plans and elevations, arrangement of hardware, operator and required clearances. Site conform exact measurements and required structural support as required is in place before incorporating notes into shop drawings submitted for review.

.2 Shop drawings also to indicated securement to structure.

1.3 WASTE MANAGEMENT

.1 Separate and recycle waste materials in accordance with Division 01, Construction Waste Management and Disposal

1.4 DESIGN CRITERIA

.1 Fire Rated Assemblies: Provide assemblies complying with NFPA 80 and listed in ULC Directory or Intertek Testing Services (Warnock Hersey Listed) Directory.

1.5 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Deliver and store materials in compliance with Division 01 Product Requirements.

.2 Comply with manufacturer’s recommendations for handling, storage and protection during installation.

.3 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.4 Label packages to include material name, production date and/or product code.

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

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

1.6 QUALITY ASSURANCE/QUALITY CONTROL

.1 Manufacturer's representative must review the final installed product.

.2 Conform to requirements of NBC 2010 for accessibility.

.3 Manufacturer Qualifications: Company specializing in performing Work of this section with a minimum of five (5) years of experience.

.4 Installer Qualifications: Installer Qualifications: Company specializing in performing Work of this section with minimum five (5) years and approved by manufacturer

1.7 EXTENDED WARRANTY

.1 Provide a two (2) year manufacturer's warranty for materials and two year (2) warranty for installation against defects.

PART 2 - PRODUCTS

2.1 OVERHEAD COILING DOOR

.1 For size and location of the overhead coiling door, refer to the drawings.

.2 Wall Installation: outside mount.

.3 Curtain Construction: interlocking roll formed slats, with end locks attached to each end of alternate slats to prevent lateral movement.
- .1 1 1/2 hr rated (refer to plans if rating is required)
- .2 22 Gauge, No 3
- .3 Grade 40 steel, to ASTM A653 and ASTM A924 galvanized steel zinc coating
  - .1 Bonderized coating for prime coat adhesion
  - .2 Factory applied Thermosetting Powder Coating applied with a minimum thickness of 2 mils.
  - .3 Color selected by Consultant from custom color selection.
  - .4 Slats: 56 mm high by 16 mm deep. Provide ULC rated label. Contractor to verify that label is easily located and readable (not painted or obscured). Fire shutter to comply with NFPA 80.

.4 Bottom Bar: The bottom bar shall consist of two 3 mm steel angles mechanically joined together. The finish on the bottom bar shall be the same powder coat finish as chosen in the curtain section.

.5 Brackets: constructed of steel not less than 6 mm thick and bolted to the wall angle with minimum 12.7 mm fasteners. The finish on the brackets shall be the same powder coat finish as indicated in the curtain section.

.6 Barrel: steel tubing of not less than 100 mm in diameter. Oil tempered torsion springs shall be capable of correctly counter balancing the weight of the curtain and shall have both a main and an auxiliary spring. The barrel shall be designed to limit the maximum deflection to .03" per foot of opening width. The springs shall be adjusted by means of an exterior wheel. The barrel shall be unpainted.

.7 Hood: fabricate of 24 gauge galvanized steel and shall be formed to fit the curvature of the brackets. Provide intermediate support bracket to support counterbalance curtain and hood. Powder coat finish.

.8 Guides: 4 steel angles bolted together with 10 mm fasteners to form a channel for the curtain to travel. The wall angle portion shall be continuous and fastened to the surrounding structure with either minimum 12.7 mm fasteners or welds, both on 915 mm centers. Powder coat finish to match coiling door.

.9 Operation:

.1 Electric motor operation; motor must close shutter door upon fire alarm to provide continuous fire separation.

.2 Automatic closure standard fire door: ULC approved release mechanism equipped with fusible link.

.3 No special tools required to reset device after release.

.4 The Auto-Test Motor Operated Fire Door shall have a model FS, UL listed and FM approved operator, NEMA 1 enclosure rating.

.5 horsepower as recommended by manufacturer, 115v single phase service.

.6 Provide an open drip-proof motor, removable without affecting setting of limit switches; thermal overload protection; maintenance free solenoid actuated brake; planetary reduction gearing and adjustable rotary limit switch mechanism; transformer with 24 v control secondary; and all integral electrical components prewired to terminal blocks.

.7 Automatic closure shall be activated by a central smoke/fire alarm system and power outage. Doors shall not require a releasing device for alarm signal activation.

.8 Door Close Time Release Speed: Door shall maintain a closing speed of not less than 150 mm (6”) nor more than 225 mm (9”) per second during automatic closure. When automatic closing is activated, electric sensing edge and push button are inoperable.

.9 Doors shall be fail-safe and close upon power failure.

.10 Resetting of spring tension or mechanical dropouts shall not be required. Upon restoration of power and/or clearing of the alarm signals, door shall immediately reset by opening with the push button.

.11 The electrical contractor shall mount the control station(s) and supply the appropriate disconnect switch, all conduit and wiring per the overhead door wiring instructions.

.12 Provide Model F-BBU Battery Back-Up System for Auto-Test FS Motor Operator capable of providing four hours of door open holding time in the event of a power failure. Battery back-up shall be able to power local detectors and warning appliances. Allow for programming open/close obstruction cycling should the sensing edge encounter a stationary obstruction in the opening during AC power, alarm signal closing.

.13 Provide a wireless electric sensing edge device. Contact before door fully closes shall cause the door to immediately stop downward travel and reverse direction to the fully open position. Provide a wireless sensing edge connection to motor operator eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operation.

.10 Operating Standard: designed to standard of 25 cycles per day and an overall maximum of 50,000 operating cycles for the life of the door.

.1 Counter balance: Helical torsion spring type housing in a steel tube or pipe barrel supporting the curtain with deflection limited to 0.03 inch per foot of span. Counterbalance is adjusted by means of an adjusting tension wheel.

.2 Contractor to coordinate the electrical wiring for motor and tie in to fire alarm system.

.3 Central Fire Alarm Release: Electric release mechanism operated from fire alarm system.

.11 ULC approved release mechanism with 165 degree fusible link. (Fire rated doors only)
- .1 Lock: Cylinder lock for electric operation with interlock switch. (cylinder lock supplied by Door Hardware Section 08 71 00). Keying to Departmental Representatives requirements.
- .2 Standard of Acceptance based on Cookson Door Type FDO-B Motor Operated Automatic Resetting Fire Door, or approved alternate.
- .3 Approved Alternate Manufacturers:
- .4 Wayne Dalton
- .5 CHI Rolling Steel Doors

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine supports and other conditions under which shutters are to be installed.

.2 Site preparations are to be detailed by approved shop drawings.

.3 Verify opening dimensions by actual site measurements.

.4 Examine conditions of substrates, supports, and other conditions under which this work is to be performed.

.5 If substrate preparation is the responsibility of another installer, notify Consultant of unsatisfactory preparation before proceeding.

3.2 PREPARATION OF SUBSTRATE

.1 Clean surfaces thoroughly prior to installation.

.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INTERFACE WITH OTHER SYSTEMS

.1 Coordinate Work with other operations and installation of adjacent materials to avoid damage to installed materials.

3.4 INSTALLATION

.1 Install rolling counter fire doors in compliance with requirements of NFPA 80. Test fire-release system and reset components after testing.

.2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

.3 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

.4 Fit and align assembly including hardware; level and plumb, to provide smooth operation.

.5 Coordinate installation of electrical service. Complete wiring from disconnect to unit components.

.6 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 92 00 Joint Sealants.

.7 Install perimeter trim and closures.

3.5 PROTECTION DURING WORK

.1 Protect installed products until completion of project.

3.6 ADJUSTMENT

.1 Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

.2 Demonstrate proper operation procedures to Departmental Representative.

.3 Instruct Departmental Representative in maintenance procedures.

3.7 CLEANING

.1 Clean all parts of assembly soiled by work as recommended by manufacturer.

.2 Remove surplus materials, packaging and debris from the site.

.3 Clean curtain and components using non-abrasive materials and methods recommended by manufacturer.

.4 Remove labels and visible markings.

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

END

PART 1- GENERAL

1.1 SECTION INCLUDES

.1 Non-rated acoustic pressed steel frames.

.2 Non-rated acoustic wood doors and panels.

.3 Perimeter and bottom acoustic seals, threshold.

.4 TR-6 Finish for Stain

1.2 RELATED SECTIONS

.1 Section 07 92 00 - Joint Sealing: Caulking between doors and adjacent construction.

.2 Section 08 71 10 - Door Hardware - General.

.3 Section 09 91 00 - Painting

1.3 REFERENCES

.1 ASTM A653/A653M-06 - Standard Specification for Steel Sheet.

.2 ASTM E90-04 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.

.3 ASTM E413-04 - Classification for Rating Sound Insulation.

.4 CSDMA Selection and Usage Guide for Steel Doors and Frames, 1990.

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

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

.7 NFPA 80-07 - Standard for Fire Doors and Other Opening Protectives.

.8 UL 10C-98 - Standard for Positive Pressure Fire Tests of Door Assemblies.

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

.10 ANSI/ICC A117.1-2003 - Standard for Accessible and Usable Buildings and Facilities

1.4 PERFORMANCE REQUIREMENTS

.1 Acoustic Performance: Minimum Sound Transmission Class STC 51 tested to ASTM E90.

1.5 REGULATORY REQUIREMENTS

.1 Installed Door and Frame Assembly: Conform to ANSI/ICC A117.1

1.6 SUBMITTALS

.1 Section [01 33 00]: Submission procedures.

.2 Shop Drawings: Indicate door and frame elevations, anchor types and closure methods, location of cut-outs for hardware.

.3 Samples: Submit manufacturer's door finish samples, showing range of colour variation, manufacturer’s frame corner sample, as well as perimeter acoustic gasket.

.4 Test Data:

.1 Submit test data indicating compliance with the Sound Transmission Class (STC51) requirements. Include laboratory name, test report number, and date of test.

.2 Submit certification from test laboratory qualified under the National Voluntary Accreditation Program (NVLAP) of the U.S. Bureau of Standards.

.5 Installation Instructions: Submit manufacturer's installation instructions.

1.7 QUALITY ASSURANCE

.1 Perform work to requirements of CSDMA (Canadian Steel Door Manufacturers Association), HMMA (Hollow Metal Manufacturers Association) standards.

.2 Manufacturer: Minimum 5 years documented experience manufacturing acoustic wood door and frame assemblies.

.3 Pre-installation Meeting: Convene a pre-installation meeting 2 weeks before start of installation of door and frame assemblies. Require attendance of parties directly affecting work of this section, including contractor, architect, installer, and manufacturer's representative. Review installation and coordination with other work.

1.8 DELIVERY, STORAGE AND PROTECTION

.1 Section 01 61 00: Transport, handle, store, and protect products.

.2 Comply with WDMA I.S. 1A for wood doors.

.3 Comply with HMMA 840 for steel frames.

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

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

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

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

.8 Store doors between 50 to 90 degrees F (10 to 32 degrees C) and 25 to 55 percent relative humidity.

.9 Clean and touch up scratches or disfigurement to metal surfaces on frame or wood surfaces on door.

1.9 WARRANTY

.1 Manufacturer's Limited Warranty: Five (5) years from date of supply, covering material and workmanship.

PART 2- PRODUCTS

2.1 MATERIALS

.1 Sheet Steel:

.1 Galvanized steel to ASTM A653/A653M, ZF180, ZF75

.2 Reinforcement Channel: To CSA G40.20/G40.21, coating designation to ASTM A653/A653M.

.3 Wood Door Panel: Acoustic core with [wood veneer] [plastic laminate] facing.

.1 Door Facing:

.1 Wood Face Veneer, species and cut to match other wood doors on the project; minimum thickness before sanding 0.6 mm (1/4 inch).

.2 Door Edging:

.1 Where door face is wood face veneer, door edges shall be supplied with matching stiles and rails

2.2 ACCESSORIES

.1 Hinges: Heavy weight butt type by PBB to be supplied with all STC doors.

.2 Primer: Rust inhibitive zinc chromate on frames.

.3 Threshold: To provide a seal for door in closed position.

.4 Perimeter and bottom acoustic seals: to provide an acoustic seal for door is closed position.

2.3 FABRICATION

.1 Manufacture doors and frames to STC rating of 51, 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, templated hardware.

.4 Lock/Latching devices, coordinate with devices specified in Section 08 71 10.

.3 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.

.4 Factory install glazing.

.5 Affix permanent metal nameplates to door and frame, indicating manufacturer's name, and STC rating. Note that where concealed vertical rod exit devices are required, the door thickness will be 2 1/8" (53mm) to accommodate the acoustic structure necessary for reinforcement of the door hardware.

2.4 FINISHES

.1 Metal Frame Finish: factory applied zinc chromate primer

.2 Factory Door Finish: Catalyzed polyurethane, premium grade, TR-6 finish to WDMA I.S. 1A. Stain and Clear Coat

.3 Top and Bottom Rails: Factory sealed with wood sealer.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install components to manufacturer's written instructions.

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

.3 Utilize welders certified by [Canadian Welding Bureau (CWB) for field welding of frame.

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

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

.6 Adjust operable parts for correct clearances and function.

.7 Install and adjust perimeter and bottom acoustic seals.

3.2 ERECTION TOLERANCES

.1 Section 01 73 00: Tolerances.

.2 Installation tolerances of installed frame for squareness, alignment, twist and plumbness are to be no more then ± 1/16in (1.5mm).

3.3 FIELD QUALITY CONTROL

.1 Provide qualified manufacturer's representative to instruct installers on the proper installation and adjustment of door assemblies.

.2 Provide manufacturer's representative to inspect door installation, and test minimum five (5) cycles of operation. Correct any deficient door and frame assemblies.

3.4 SCHEDULE

.1 Acoustic Wood Door and Frame Assembly Schedule:

Tag	Door Number	Frame Material	Fire Rating	STC Rating	Door Finish	Comments
D-1	208	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-2	209	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-3	210	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-4	211	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-5	212	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-6	213	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-7	215	GS	NFR	51	S-CC	Reference Door Schedule for Sizing
D-8	222	GS	NRF	51	S-CC	Reference Door Schedule for Sizing

END

PART 1 - GENERAL

1.1 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

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

1.2 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, including installation instructions, MSDS sheets, specifications and data sheets in accordance with Section 01 33 00 Submittal Procedures.

.2 Samples:
- .1 Submit sample of perforated aluminum screen.

.3 Shop Drawings:
- .1 Indicate installation requirements including dimensions, head and jamb conditions, track layout, stacking arrangement, switching, hardware, finish and colour, floor pins, and location.
- .2 Verify site conditions and coordinate with other trades before shop drawings are produced to include actual site dimensions and clearances.

1.3 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials.

1.4 WASTE MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 74 19 Construction Waste Management and Disposal.

1.5 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Deliver and store materials in compliance with Section 01 61 00 Common Product Requirements.

.2 Comply with manufacturer’s recommendations for handling, storage and protection during installation.

.3 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.
- .1 Protect metal finishes with wrappings (not adhesive wrappings that could damage surface).

.4 Label packages to include material name, production date and/or product code.

1.6 QUALITY ASSURANCE/QUALITY CONTROL

.1 Manufacturer's representative must review the final installed product.

.2 Conform to requirements of NBC 2010 for accessibility.

.3 Provide components from a single manufacturer.

1.7 EXTENDED WARRANTY

.1 Manufacturer’s standard limited two (2) year warranty on materials and two year warranty on installation.

PART 2 - PRODUCTS

2.1 FOLDING CLOSURE MATERIALS

.1 Folding Security Grille:
- .1 Full height aluminum panel curtain is constructed of 150 mm wide modules linked together by a continuous aluminum hinge.
- .2 Hinges hold aluminum panels 137 mm wide and 1.6 mm thick completely recessed throughout their full height.
- .3 Top and bottom of each section fitted with an aluminum panel 100 mm high consisting of an aluminum extrusion 1.6 mm thick and composed of modules with a 15° angle between them to facilitate the operation of the closure.
- .4 Panels: perforated panels with 5mm diameter holes providing visibility and ventilation through the panels, each grille panel is protected at its perimeter by a vinyl extrusion recessed within the full height of the hinges.
- .5 Finish: anodized aluminum.
- .6 Track: overhead track 33 mm wide by 39 mm high. Refer to detail.
- .7 Stacking: to not exceed depth of 29 mm per 300 mm of closure width plus 75 mm for each post (lead, end or intermediate).

.2 Hardware:
- .1 Lead post equipped with a hook bolt lock with cylinders each side.
- .2 Coordinate with Section 08 71 00 Door Hardware for mortise cylinders keyed to Departmental Representative’s requirements.
- .3 Lead post: full height wall jamb.
- .4 Trailing post: self-locking at the top and bottom inside the storage pocket.

.5 Free floating intermediate posts: located at all curves and at recommended intervals. To be equipped with self-adjusting spring loaded drop bolts activated from the inside only. Drop bolts to engage dust proof stainless steel covers and receptacles.

.3 Acceptable Manufacturers:
- .1 Mobilflex, Aeroflex, horizontal folding grille.
- .2 Dagendor, Visionair
- .3 Dynaflair, Elegance

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Door installer to verify that the installation area is dry, clean, and free of foreign matter.

.2 Examine flooring, overhead support and opening, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of operable partitions. Proceed with installation only after unsatisfactory conditions have been corrected.

.3 Verify that there is minimum 125 mm clear either side of horizontal grille once contained in stacking closet.

.4 Verify that the depth of the stacking closet for horizontal grille is sufficient.

3.2 INTERFACE WITH OTHER SYSTEMS

.1 Coordinate installation of wood blocking for wall connection.

.2 Coordinate locks with Section 08 71 00 Door Hardware.

.3 Coordinate support structure with Section 05 50 00, and cladding with Section 09 21 16 Gypsum Wall Board and 09 22 16 Non-Structural Metal Stud Framing.

.4 Coordinate extent of stacking closet for track/grille enclosure when stored.

3.3 INSTALLATION

.1 Verify that the overhead structural support is strong enough to carry the weight and use of the security grille, in closed and in open position.

.2 Secure and level track.

.3 Install partitions in accordance with manufacturer's printed instructions.

.4 Touch up damaged finishes, repair damage to partitions to match original finish.

3.4 ADJUSTMENT

.1 Adjust grille to operate smoothly, easily, and quietly, free from binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Lubricate hardware and other moving parts.

3.5 CLEANING

.1 Clean grille surfaces upon completing installation to remove dust, dirt, adhesives, and other foreign materials according to manufacturer's written instructions.

END

PART 1 - GENERAL

1.1 REFERENCES

.1 Applicable standards; standards of the following, as referenced herein:
- .1 American Society for Testing and Materials (ASTM)
- .2 National Electrical Manufacturer's Association (NEMA)
- .3 Underwriters Laboratories, Inc. Certified Canada
- .4 ANSI/DASMA 102

1.2 SUBMITTALS

.1 Product Data: Submit manufacturers' product data, roughing-in diagrams and installation instructions for each type and size of high-speed rolling door. Provide operating instructions, maintenance information and complete information describing the operating system including rough-in instructions.

.2 Shop Drawings: Submit shop drawings for special components and installations that are not fully dimensioned or detailed on the manufacturer's data sheets, including equipment interconnection diagrams.

1.3 PERFORMANCE REQUIREMENTS

.1 To NBCC 2010 Wind Load Standards of the location where installation is completed.

1.4 QUALITY ASSURANCE

.1 Furnish each high-speed rolling door as a complete unit produced by one manufacturer, including hardware, accessories, mounting and installation components. Furnish highspeed rolling doors by one manufacturer for the entire project.

.2 Inserts and Anchorages: Furnish fasteners and spacers as required to facilitate installation. If special requirements are necessary, coordinate those requirements with the general contractor.

1.5 WARRANTY

.1 Manufacturer shall warrant:
- .1 SBR fabric for the life of the door, labor limited to one (1) year.
- .2 Optional EDPM fabric for five (5) years, labor limited to one (1) year.

.2 Manufacturer shall warrant mechanical and electrical components against defects in material and workmanship for (2) years, labor limited to one (1) year.

PART 2 - PRODUCTS

2.1 MATERIAL AND COMPONENTS

.1 Door Panel
- .1 Fabric:
  - .1 2 layers of Styrene Butadiene Rubber (SBR) each 1/8" (0.8mm) thick, 70 durometer; sandwiched with 1-ply, 110lbs (50kg) polyester cord center
  - .2 Complete with bonded SBR bevelled continuous windlocks, providing normal resiliency and flexibility at temperatures ranging from -40° F to +180°F (-40°C to +85°C).
- .2 Characteristics:
  - .1 Breaking strength 1100 lbs/in/ply
- 3. Standard color- Black

.2 Door Header
- .1 Door roll
  - .1 Fabricate 8 5/8" (219 mm) diameter, steel tube from 0.188" (4.75 mm) steel complying with ASTM A513.
  - .2 Drum tube deflection shall not exceed 0.03" per foot (2.5 mm / M) of opening width.
  - .3 Drive barrel shafts are constructed of 2" (50.8 mm) diameter C1045 bolton steel shafts.
- .2 Idler
  - .1 Fabric guiding barrel shall be constructed of minimum 4" (102 mm) O.D. round tubing with a minimum wall thickness of 0.134" (3.4 mm) and supported by 1 ½" (32 mm) diameter C1018 steel shafts.
- .3 Top plates
  - .1 Constructed of ¼" (6 mm) hot-rolled steel laser-cut plates with heavyduty, self-aligning bearings with cast iron housings to support both the spring and idler barrels. 2" (50.8 mm) diameter shaft bearing shall be loadrated at 10800 lbs (48000N) dynamic and 6400 lbs (28500 N) static. 1 ½" (32 mm) diameter idler shaft bearing shall be load-rated at 8150 lbs ((36000 N) dynamic and 4400 lbs (19600 N) static.
  - .2 To include top roll alignment plates for installation
- .4 Counterbalance System
  - .1 Pre-mounted with evenly balanced 100K cycle or 200k cycle torsion springs with protective hood.

- .5 Truss
  - .1 Shall brace top plates with spreader bars, sized with a minimum 2 ½" X 2 ½" X ¼" steel angles with diagonal bracing to support loads of up to 2000lbs.

.3 Bottom profile
- .1 Bottom beam

.1 Bottom bar shall extend the full width of the curtain, sufficient to maintain the bottom edge of the curtain parallel to the door threshold at all times. The bottom bar shall be constructed of 2 ½" X 2 ½" X 0.25" (63.5 X 63.5 X 6.35mm) steel angle and 3" X 0.188 (76.2 X 4.78 mm) flat bar bolted together and shall have a breakaway centre section to reduce risk of damage during accidental impacts and provide ease of straightening, allowing for simple re-assembly.

.2 6" tall weatherproof rubber loop made of EPDM able to seal uneven finished floors

.2 Reversing edge

.1 Rubber EPDM profile shall be 2.25" (57 mm) high. Designed to hold and protect the watertight electric edge.

.2 Fail safe electric reversing edge to stop and reverse door upon contact.

.4 Side frames

.1 Frames

.1 Frame assemblies shall be constructed of steel members to form a slot of sufficient depth to allow the thicker edges of the rubber curtain windlocks to move freely in the guides at all times. Steel members are to be of sufficient thickness and rigidity to maintain the windlocks within the guides at curtain pressures of up to 0.96 kPa (20 lbs. per square foot), while enabling the windloks to break away during impacts that generate pressures beyond 20 lbs. per square foot (0.96 kPa).

.2 Side frame structural rectangular steel tube 2" X 5" X ¼" (50.8 X 127 X 6 mm), and structural steel 3" X 5" X ¼" (76 X 127 X 6 mm) angle frames to support maximum header weight.

.3 Provide side frame shelf for top roll alignment.

.2 Paint

.1 Painted with durable, chemical and corrosion resistant coating.

.2 Color: orange.

.5 Head jamb and frame

.1 Provide galvanized structural steel v-shape head and jamb frame 50 x 215 x 6 to protect exterior wall.

.6 Photocell

.1 Provide an inline thru beam photocell in proximity to door line.

.2 To stop and reverse door upon object detection.

.3 Provide inline photocell in proximity to door line.

.7 Electrical Operation

.1 Drive

.1 Shall be electrically operated by a heavy-duty drive unit featuring self inhibiting worm gear. The motor and gearbox shall be designed for high cycle operation. Door position shall be controlled by top and bottom limit switch. Basic operation features shall include a manual disengagement lever to place the door in manual operation mode. A

safety disengagement switch shall be included with the disengagement mechanism.

.2 To include back-up safety top and bottom limits.

.3 Shall be wired and labeled with a minimum 6 ft (1.8 M) lead.

.2 Electrical Motor

.1 Provide high-starting torque, reversible intermittent duty, enclosed nonventilated electric motor, sized to move door in either direction, from any position.

.2 Power Supply:

.1 Primary Voltage: Coordinate wiring requirements and current characteristics of door electrical system with building electrical system. Supply shall be rated at 220 volt, (3) phase, 60 Hz, 20 amps.

.3 Control Panel

.1 Drive shall be controlled by an ACS50.

.2 Panel enclosure shall be NEMA 4.

.3 Internal control box wiring shall be completed by manufacturer and shall be CUL listed.

.4 Control functions determined by dip switch settings.

.5 Top and bottom limits to be adjustable from the drive.

.6 Control panel shall include an adjustable, automatic closing timer, emergency stop, two actuating push button and a cycle counter.

.4 Actuators

.1 Optional actuation systems available shall be NEMA 4 rated or equivalent **Push button stations and Metallic activated floor loop receiver reset system for vehicle detection.

.8 Protection features

1. Provide thermal protection to protect motor from temperature build-up.
2. Provide switch to electrically disconnect control circuitry during manual operation.
3. Provide running timer to protect drive unit from motor run-on.
4. Provide safety edge system that is continuously monitored and prevents door from closing if a fault is detected.
5. Provide stop feature to momentarily stop door in any position.
6. Provide a photocell tested every cycle.

2.2 OPTIONS

.1 Warning horn and light shall indicate when door is about to close.

.2 Windbar shall provide added protection against **heavy wind** and extreme pressure differentials.

.3 Full Roll Cover: Fabricate from 20 gauge galvanneal. Top shall have a 6” slope from back to front.

.4 200k cycle torsion spring.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Install door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers and equipment supports in accordance with final shop drawings, manufacturer's product data and as specified herein.

.1 Secure guides to walls, plumb, level and true to line. Anchor guides at spacings indicated on approved shop drawings.

.2 Provide additional support as necessary for attachment of guides, brackets and door and operator mechanisms to interfacing surfaces.

.2 Connect and adjust electrical components and operating hardware.

END

PART 1 - GENERAL

1.1 REFERENCES

.1 Aluminum Association Designation System for Aluminum Finishes-2003

.2 ASTM E330-02 (2010) Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.3 ANSI/ASHRAE 90.1-2010 (I-P) Energy Standard for Buildings Except Low-Rise Residential Buildings

.4 CAN/ULC-S524-06 Installation of Fire Alarm Systems

.5 BHMA A156.10 Power Operated Pedestrian Doors

.6 AAMA-611-98 Anodized Architectural Aluminum

1.2 SYSTEM DESCRIPTION

.1 Automatic Door Equipment: Electro-Mechanically operated with presence sensor.

.2 Type of Door Operations: Fully automatic. On receipt of signal from building fire alarm and smoke detection systems, door will operate manually.

.3 Door: Bi-parting sliding.

.4 Traffic Movement: Two way traffic.

1.3 DESIGN REQUIREMENTS

.1 Design automatic entrance doors as emergency exits, as required means of egress from the building, and to comply with NBC 2010.

1.4 PERFORMANCE REQUIREMENTS

.1 Automatic door equipment to accommodate high frequency pedestrian traffic.

.2 Operator Equipment: CSA approved.

.3 Automatic Locks and Panic Hardware to Non-Fire Rated Exit Doors: ULC listed and labelled.

.4 Operating Hardware to Fire Rated Doors: ULC listed and labelled.

.5 Design framing members to withstand their own weight, weight of glass, loads imposed by motion of operable elements, and design wind and suction loads, as calculated in accordance with NBC 2010 and applicable municipal regulations, to maximum allowable deflection of 1/175 of span, when tested in accordance with ASTM E330.

.6 Provide expansion joints to accommodate movement in door, door frame and screen framing system, and between system and building structure, caused by structural movements, and dynamic loading and release of loads, without permanent distortion, damage to infills, racking of joints, breakage of seals, or water penetration.

.7 Provide for thermal movement of door and screen framing system caused by ambient temperature range without causing buckling, failure of seals, undue stress on fasteners or other detrimental effects, and to prevent transmission of stress to operators.

.8 Provide for dimensional distortion of components during operation.

.9 Provide manual operation for opening and closing of doors during electrical power failure and when power is manually switched off.

.10 Provide framing members and finished metal sheets with uniform appearance and colour.

.11 Eliminate the possibility of water accumulating and freezing in door power units.

.12 Design equipment to operate at ambient temperatures between -40 degrees C and 170 degrees C.

1.5 SUBMITTALS

.1 Submit product data and shop drawings under provisions of Section 01 33 00 - Submittals.

.2 Indicate on shop drawings, layout, dimensions, elevations, detail sections of members and sill conditions, materials, finishes, recesses, hardware including mounting heights, anchors and reinforcements, provisions for expansion and contraction, methods of joining sheet metal and joint locations, glass types and glass thicknesses, glazing details, types of sealants, details of other pertinent components of the work, and adjacent construction to which work of this section is attached. Identify installation tolerances required, assembly conditions, routing of service lines, locations of operating components, controls and boxes. Indicate door signs.

.3 Provide manufacturer's technical product data for door units, framing systems and operators for each type of entrance required. Include fabrication methods, finishing, hardware and operator sizes, roughing-in and wiring diagrams, parts lists, accessories and other components. Include data substantiating that system will perform as specified.

.4 Submit manufacturer's certificate under provisions of Section 01 45 00 - Quality Control that automatic entrance door systems meet or exceed specified requirements.

1.6 OPERATION AND MAINTENANCE DATA

.1 Submit manufacturer's operation and maintenance data under provisions of Section 01 77 00 – Closeout Procedures.

.2 Include manufacturer's parts lists, servicing frequencies, instructions for adjustment and operation applicable to each type of component or hardware, and name, address and telephone number of nearest authorized service representative.

1.7 QUALITY ASSURANCE

.1 Drawings are based on one manufacturer's automatic entrance door system. Another manufacturer's system of a similar and equivalent design will be acceptable when differences do not materially detract from design concept or intended performance, as instructed by the Consultant.

.2 Manufacturer's Qualifications: Products specified shall be represented by a factory authorized and trained distributor. Distributor shall maintain a parts inventory and trained service personnel capable of providing service.

.3 Air infiltration is not to exceed 11 cfm per linear foot of door crack as defined by ANSI/ASHRAE Standard #90.1 (I-P)

1.8 QUALIFICATIONS

.1 Manufacturer: Company specializing in the manufacture of automatic entrance door operating equipment and framing assemblies and capable of showing prior production of doors similar to those specified with five years documented experience.

.2 Installer: Company which is an authorized representative of the automatic entrance door manufacturer for both the installation and maintenance of the type of units specified, and with three years documented servicing and installing experience.

.3 Maintenance Proximity: Offices and maintenance facilities of installer shall be located not more than two hours normal travel time for the project site.

1.9 REGULATORY REQUIREMENTS

.1 Conform to NBC 2010 for release of automatic locks to permit manual operation of emergency exit doors and to CAN/ULC-S524 where required to be integrated with building's fire alarm system.

1.10 PRE-INSTALLATION CONFERENCE

.1 Convene a pre-installation conference one week prior to commencing work of this section.

.2 Review conditions of installation, installation procedures, and coordination with related work.

1.11 DELIVERY, STORAGE, AND HANDLING

.1 Deliver doors and related components to site under provisions of Section 01 61 00 - Basic Product Requirements.

.2 Cover exposed metal surfaces with pressure sensitive heavy protection paper or strippable plastic coating. Do not use materials of the type which will become bonded when exposed to the sun, or leave residue. Use padded blankets or other approved protective wrapping for decorative metal work and other similarly finished exposed elements.

.3 Do not deliver door units until work is ready for their installation.

1.12 FIELD MEASUREMENTS

.1 Field measure openings and clearances before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrication with construction progress to avoid delay. If necessary, proceed with fabrication of non-critical items until measurements can be taken.

1.13 WARRANTY

.1 Provide two year manufacturer's warranty under the provisions of Section 01 77 00 – Closeout Procedures.

.2 Warranty: Include coverage of repair or replacement of components or entire units which fail in materials workmanship. Failures include but are not necessarily limited to, structural failures including excessive deflection, excessive leakage or air infiltration, faulty operation of operators speed control and hardware, deterioration of metals, metal finishes, and other materials beyond normal weathering.

1.14 MAINTENANCE SERVICE

.1 Furnish complete service and maintenance of operating equipment for two years from date of substantial performance of the work.

PART 2 - PRODUCTS

2.1 MATERIALS - AUTOMATIC SLIDING SYSTEM

.1 Description:

.1 Part Slide Heavy Duty Automatic Sliding Door System, Package size as noted on drawings, clear door opening 72", clear anodized aluminum finish. Standard narrow stile package full breakout package includes: 2" stiles and mid rail, 4"

bottom rail and 5" top rail; SU100 microwave motion sensors on either side of header; Stanguard active infrared threshold presence sensor; 1 doorway holding beam for activation and safety; 1/4" clear temp glass for interior doors and sidelites; ¼" tempered glass 2 sides insulated for exterior doors and sidelites; rotary multifunction key switch on door/header to control operator; full width threshold.

.2 Finish: Clear anodized finish No. 17 conforming to standard AA-M12C2231 Class I finish.

.3 Exterior mounted in aluminum curtain wall system, interior mounted in aluminum framing.

.4 Install extra ball catch at bottom of door leaf.

.5 Glazing refer to section 08800.

.6 Aluminum frames and horizontal rails shall be fabricated of 6006-T6 alloy header capable of spanning full width of specified system.

.7 The door carrier shall incorporate two (2) steel roller wheels per active door leaf to ensure smooth operation over a replaceable Delrin track inlaid into the support beam. The carriers shall also incorporate two (2) anti-rise devices per leaf. Roller wheels shall be plated to protect against corrosion and shall incorporate doubled journal sealed, oil impregnated bearings. Door carriers shall permit overall lateral and vertical door adjustment of 3/4" with positive mechanical lock.

.8 Vertical jambs shall be 1-3/4" x 4-1/2" extruded aluminum. The header shall be 8-1/8" x 6-1/4"and shall incorporate a continuous integral hinge for header covers. Top rails 5-1/2" high and bottom rails 5" high.

.9 Acceptable Manufacturers:

.1 Besam Unislide Bi-Part Automatic Sliding Door c/w transom

.2 Stanley Dura-Glide 3000 B1-Parting Door c/w transom

.3 NabCo GT1175 Whisper Slider c/w transom

.2 Transom & Sidelight (Exterior and Interior):

.1 Coordinate with Section 08 44 00.

.3 Location: Refer to Plans

2.2 OPERATION AND SAFETY

.1 Automatic glass sliding doors shall be powered by means of an electric motor and mechanical gear assembly transmitted to the active leafs by a drive belt. Signals received by the motor from actuation controls shall power the door to the open position. The opening cycle shall be stopped by means of microprocessor generated signal that electronically reduces voltage to the motor. The doors shall then complete the opening at slow speed until the door encounters the mechanical stop.

.2 The doors shall be powered closed after remaining in the opening position for the pre-set time. The door(s) shall return at the normal closing speed until they encounter a signal from the microprocessor at which point, speed shall be reduced, slowing the doors to creep speed until they reach the fully closed position.

.3 The system shall incorporate 2 photocell hold open devices. The photo beams shall span the entire width of the sliding door opening and shall prevent door from closing when a light beam is obstructed. The automatic door equipment shall contain an additional integral sensing device that shall automatically reverse the doors should an obstruction be encountered during the closing cycle, returning the doors to the full open position. When an obstruction is encountered in the opening cycle, the door shall come to a complete stop. The next full cycle after an obstruction has been encountered shall be a "search mode" cycle wherein the door shall open and close in a creep speed mode.

.4 The system shall be equipped with emergency release hardware, top and bottom pivots which allows for the active leaf to swing out in the direction of egress, and shall include a Canadian Standards Association (CSA) listed breakaway release latch.

.5 Microprocessor software shall be designed to constantly monitor system operations. Should door speed, motor function or operations deviate from design criteria ranges, the watchdog control circuit shall assume command of the system and shut down the automatic function by holding door open. A redundant supervisory circuit shall monitor the main watchdog control circuit every 255 door cycles, ready to perform as a back-up.

2.3 SLIDING DOOR OPERATOR

.1 The operating unit shall be microprocessor control, electro-mechanical operator consisting of a DC shunt-wound permanent magnet motor with sealed ball bearings, mechanical drive assembly. The microprocessor system shall automatically define and set the opening and closing creep positions, and the fully open and fully closed position of the door system. Mechanical limit switches will not be accepted. The control shall include an adjustable time delay (1-60 seconds).

2.4 ENERGY SAVING DEVICES

.1 The automatic door system shall be equipped with control for reducing the door opening size. The switch shall be located in the vertical jamb of the automatic door. The switch shall reduce the total door opening to reduce air loss. Through microprocessor programmed intelligence, door opening shall automatically resume the full open position wherever traffic flow exceeds pre-set volumes. The door system shall be equipped with heavy weather pile between the doors and sidelites, between emergency breakaway hardware and door stiles and exceed ASHRAE Standard/IES 90A-1980 for air leakage.

2.5 ACTIVATING DEVICES

.1 Automatic glass sliding door system shall include one (1) Pathfinder motion detector for one-way traffic and two (2) Pathfinder motion detectors for two-way traffic. Motion detectors shall be located in a central position to be traffic pattern and shall constantly monitor the detection zone. the detector shall provide a continuous, unbroken sensing field as requested by BHMA 156.10, latest revision date.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Prior to installation, contractor to ensure all opening sizes are as per approved drawings and report any discrepancies to the general contractor.

.2 Ensure that structural frame is in place with proper elevation and location necessary to install this unit. Ensure all deflection space allowances are incorporated.

.3 Co-ordinate with Section 08 44 00 for opening and connection requirements in framing system.

3.2 INSTALLATION

.1 Install tracks and panels level and plumb in accordance with manufacturer's instructions.

.2 Install stops and bumpers as recommended by the manufacturer.

.3 Installation by factory trained personnel and verified by manufacturer's representative as per Section 1.6 of this specification.

3.3 GLAZING

.1 Glaze aluminum doors, using specified glass in accordance with Section 08 80 50.

3.4 CAULKING

.1 Where required seal between members of aluminum work.

.2 Apply sealant in accordance with Section 07 92 00. Conceal sealant within the aluminum work except where exposed use is permitted by Architect.

3.5 OPERATION

.1 Upon completion of glazing check units for squareness, alignment and smooth operation.

3.6 CLEANING AND ADJUSTMENT

.1 Clean and polish glass and frames upon completion of installing the system. Remove all labels and stickers.

END

PART 1 - GENERAL

1.1 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

.2 American Society for Testing and Materials International, (ASTM):
- .1 ASTM A36/A36M-14, Standard Specification for Carbon Structural Steel.
- .2 ASTM B221-14, Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

.3 Canadian General Standards Board (CGSB):
- .1 CAN/CGSB 12.8-97, Insulating Glass Units.
- .2 CAN/CGSB 79.1-M91, Insect Screens

.4 Canadian Standards Association (CSA International):
- .1 CAN/CSA A440/A440.1-00 (R2005), Windows/Special Publication A440.1-00, User Selection Guide to CSA Standard CAN/CSA A440-00, Windows.
- .2 CAN/CSA S157-05/S157.1-05 (R2010), Strength Design in Aluminum / commentary on CSA S157-05, Strength Design in Aluminum.
- .3 CAN/CSA W59.2-M1991 (R2013), Welded Aluminum Construction.

.5 National Building Code of Canada (NBC), 2010.

1.2 SUBMITTALS

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

.2 Manufacturer's Information:
- .1 Submit manufacturer's installation instructions.
- .2 Submit verification that insulating glass units used in curtain wall system meet U values specified.
- .3 Provide operating and maintenance data for windows for incorporation into O & M Closeout Manual.

.3 Shop Drawings:
- .1 Submit Shop Drawings in accordance with Section 01 33 00.
- .2 Indicate:
  - .1 Indicate all internal reinforcing as required by the design.
  - .2 Materials and connection and tie-in details in large scale for head, jamb and sill.
  - .3 Profiles of components.
  - .4 Junction between combination of units.
  - .5 Elevations of units.

.6 Anchorage and clips, fastener details.
.7 Description of related components within assembly, exposed finishes, glass and infill panels c/w insulation, and reinforcement
.8 Operable window and door details
.9 Detail anticipated deflection of system and show details to accommodate deflection
.10 Expansion and contraction joint location and details
.11 Detail field welding requirements

.3 Engineers Stamp:
.1 All Shop Drawings, stamped and signed by a Structural Engineer registered to practice in the province where the work is being done, to satisfy wind loading requirements as per NBC.

1.3 DESIGN CRITERIA

.1 Curtain wall shall be in compliance with Part 5 of the NBC.

.2 The entire curtain wall system shall be designed on the "Open Rain Screen" principle and shall provide:
.1 Gaskets, sleeved spiggotted joints, and seals necessary to ensure no rain water entry into the cavities of the system.
.2 Required air seals to effectively limit the passage of air from the system cavities into the building and vice versa, to ensure an adequate equalization of pressure of the cavities of the system with the exterior.
.3 The air and vapour seals necessary to limit air borne vapour exfiltration from the building interior into the cavities of the system.
.4 Openings between the system cavities and the exterior shall be sufficient cross-section to provide equalization of pressure. All openings shall be suited so as to limit direct water entry.
.5 Provide and accommodate for:
.1 Thermal expansion.
.2 Floor deflection of positive and negative.
.3 Wind load and pressure differences.
.4 Inter-storey drift.

1.4 WASTE MANAGEMENT

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

1.5 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Deliver and store materials in compliance with Section 01 61 00 Common Product Requirements.

.2 Comply with manufacturer’s recommendations for handling, storage and protection during installation.

.3 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.4 Protect factory finished aluminum surfaces with wrapping until curtain wall and accessories are fully installed and any adjacent materials are fully installed.

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

1.6 QUALITY ASSURANCE/QUALITY CONTROL

.1 Manufacturer's technical representative to provide three visits; two during construction and one final review on Substantial Completion of this work, with written report for each site visit to be forwarded to the consultant, ensuring works have been completed as per specification.

.2 Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the province where the Work is being done.

1.7 EXTENDED WARRANTY

.1 Provide a written warranty in the name of the Departmental Representative stating that the curtain wall system; including but not limited to frames, glazing, panels, flashings, etc., is guaranteed against workmanship for a period for sixty (60) months from the date of Substantial Completion

.1 Provide warranty on workmanship that glazed aluminum curtain wall will stay in place and remain leak proof including coverage for complete system failure in accordance with GC 24.

.2 Provide a written warranty for a period of twenty-four (24)months on finishes, against fading or discolouration on factory applied finishes.

PART 2 - PRODUCTS

2.1 CURTAIN WALL SYSTEM

.1 Standard of Acceptance based on Alumicor Ltd. Thermawall 2600 Series.

.1 Provide thermally broken glazed aluminum curtain wall following rainscreen principles:

.1 Seal horizontal members to vertical members to form individual compartments in accordance with rainscreen principles.

.2 Provide internal mullion baffles to eliminate stack effect and air movement within internal spaces.

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

.4 All back sections of curtainwall to be the same depth.

.2 Provide curtain wall aluminum components and wall system to ASTM B221, 6063 alloy with T5 or T6 temper.
  .1 Steel sections: ASTM A36/A36M.

.3 Aluminum Assemblies: Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.
  .1 Aluminum welding to CAN/CSA W59.2.
  .2 Frame Dimension: Standard 62 mm width; depth dependent on design.
  .3 Cap Depth: 19 mm; and specialty custom perimeter caps depths as indicated on drawing.

  .4 Accurately fit and secure joints and corners. Make joints flush hairline and weatherproof.
  .5 Reinforce framing members for external imposed loads.
  .6 Visible manufacturer's identification labels not permitted.

.4 Fasteners & Clips:
  .1 Fasteners, screws and bolts: Tamperproof, cadmium plated stainless steel to meet curtain wall requirements and as recommended by manufacturer.
  .2 Anchors:
    .1 Anchors to have 3-way adjustment, hot dip galvanized cast iron.
  .3 Connector Clips:
    .1 Exposed: aluminum or stainless steel with aluminum materials;
    .2 Non-exposed: as for exposed or may be galvanized steel.
    .3 Slotted connectors to structure for deflection purposes. Coordinate with structural.
    .4 Provide bituminous coating between structure and aluminum framing.

.5 Caps:
  .1 Typical: aluminum caps standard size, horizontal and vertical locations as indicated on drawings.

.6 Air / Vapour Retarder:
  .1 Provide window frames with factory installed air barrier/vapour retarder material for sealing to window opening with air barrier and vapour retarder installed: at rough opening.
  .2 Material: SBS Air vapour material supplied by mechanically fastened to frame with extruded aluminum bar. Provide for minimum 200 mm overlap of material around perimeter of frames

.7 Glazing: Refer to 08 80 00 Glazing Section.

.8 Automatic Aluminum Doors: Refer to 08 42 29 Aluminum Automatic Sliding System.

.9 Approved Alternate Manufacturers (Must meet specification as noted herein and as detailed on drawings):
  .1 Kawneer
  .2 Anotec
  .3 Commdoor

2.2 EXTERIOR ALUMINUM DOORS

.1 Standard of Acceptance: Alumicor Thermaporte 7700 Series 400B Style door, or approved alternate.

.1 Provide aluminum-framed swing door with glazing suitable for inclusion in curtain wall system Construct doors of portable extrusions with minimum wall thickness of 3 mm.

.1 Design aluminum components to CAN/CSA S157.

.2 Insulating glass units for exterior glazed door: To CAN/CGSB-12.8, double glazed, hermetically sealed, argon filled insulating glass units with low conductance warm edge spacer.

.2 Thickness: 57.2 mm thick door.

.3 Top rail approximately 98.4 mm wide.

.4 Bottom rail approximately 177.8 mm wide.

.5 Center Rail Option: 260.4 mm wide.

.6 Stiles: 203 mm wide

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

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

.9 For door swings and location refer to Door and Frame Schedule

.10 Approved alternate manufacturers: Aluminum doors to be thermally broken and to meet detailed specifications herein:

.1 Kawneer

.2 Anotec

.3 Commdoor

.11 Finish Hardware, refer to 08 71 00.

2.3 ALUMINUM SILLS

.1 Brake form aluminum sections.

.2 3 mm thick aluminum construction with drip edge and jamb return.

.3 Finish: anodized finish to match colour of adjoining window framing system.

2.4 SEALANTS

.1 Refer to Section 07 92 00 Sealants.

2.5 GLAZING

.1 Refer to Section 08 80 00 Glazing.

2.6 FINISHES

.1 Clear anodized finish No. 17 conforming to Standard AA-M12C2231 Class 1 finish.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify adjacent building components are ready to receive curtain wall installation and door installation.

.2 Verify wall openings and air barrier / vapour retarder materials are ready to receive work of this section.

.3 Inform Contractor and Consultant of any unacceptable conditions.

.4 Proceed with installation after unacceptable conditions have been remedied.

.5 Site verification of conditions:

.1 Take critical site dimensions to ensure that adjustments in fabrication or installation are provided for, that allowance is made for possible deflection of structure at heads, and that clearance to other construction has been maintained.

.2 Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements, fabrication schedule with construction progress to avoid construction delays.

.6 Anchors and inserts, installed by others, are to be adequate to meet specified requirements; make adaptations, if required, before installation.

3.2 INTERFACE WITH OTHER SYSTEMS

.1 Anchors and inserts, installed by others, are to be adequate to meet specified requirements, and make adaptations before installation.

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

.3 Coordinate attachment and seal of perimeter air barrier and vapour retarder materials.

.4 Pack foam insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

.5 Coordinate with Division 26 for power assist hardware noted in Door Hardware Section 08 71 00.

.6 Coordinate with Section 08 80 00 Glazing.

.7 Coordinate with Section 08 42 29 Automatic Aluminum Door Systems.

3.3 INSTALLATION

.1 Glazing Installation:

- .1 Install work plumb, plumb, level and in accordance with shop drawings, and manufacturer's instructions.
- .2 Do not force units into place, nor superimpose on them loads for which they were not designed.
- .3 Provide for thermal movement to take place between units and adjacent construction.
- .4 Secure units by non-corrosive and inorganic anchorage materials.
- .5 Conceal anchors, clips, blocking and all other attachments.
- .6 Install reinforcing and supporting members as specified or indicated as part of the work of this section.
- .7 Seal metal-to-metal joints between components included in the work of this section to ensure a weather tight assembly, and in accordance with sealant manufacturer's specifications.
- .8 Install units with consideration for finish variations. Abrupt variations of appearance or colour in adjacent components will not be acceptable without approval before installation.
- .9 Provide air barrier connection to wall substrate air barrier with given 200 mm overlap. Ensure continuity of air barrier.
- .10 Install galvanized pan and insulation as specified in locations as noted on drawings. Ensure backpan is fully perimeter sealed to aluminum frame.

.2 Window Sill Installation:

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

.3 Sealant Installation:

- .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 manufacturer's recommendations. Conceal sealant within window units except where exposed use is permitted by Consultant.

.4 Head Flashing Installation:

- .1 Install aluminum head flashing with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces. Use one piece lengths at each location.

.5 Door and Operable Window Installation:

.1 Install aluminum swing doors in accordance with manufacturer's written instructions.

.2 Install windows in accordance with manufacturer's written instructions and to CAN/CSA A440/A440.1.

3.4 PROTECTION DURING WORK

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

3.5 PROTECTION AFTER WORK COMPLETED

.1 Repair damage to adjacent materials caused by aluminum window installation.

.2 Protect aluminum curtain wall system from damage from grinding and polishing compounds, plaster, lime, acid, cement, or other harmful contaminants.

3.6 ADJUSTMENT

.1 Adjust operating sash for smooth operation.

3.7 CLEANING

.1 Refer to Section 01 74 00 Cleaning.

.2 Remove protective material from prefinished aluminum surfaces.

.3 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.

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

.5 Remove deposits which affect appearance or operations of units.

.6 Clean and restore stained metal surfaces in accordance with manufacturer's recommendations. Replace if cleaning is impossible.

END

PART 1 - GENERAL

1.1 REFERENCES

.1 Aluminum Association (AA),

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

.2 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40, Anticorrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-79.1, Insect Screens.

.3 Canadian Standards Association (CSA)

.1 CSA-A440-00/A440.1, A440, Windows / Special Publication A440.1, User Selection Guide to CSA Standard A440, Windows.

.2 CAN/CSA-Z91, Health and Safety Code for Suspended Equipment Operations.

1.2 SUBMITTALS

.1 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.

.2 Shop drawings to indicate continuation of air barrier and vapour barrier between wall assembly and aluminum window.

.3 Submit one complete full size window sample of each type window.

.4 Include frame, sash, sill, glazing and weatherproofing method, insect screens, surface finish and hardware. Show location of manufacturer's nameplates.

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

1.3 TEST REPORTS

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

.1 Windows classifications

.2 Air tightness

.3 Water tightness

.4 Wind load resistance

.5 Condensation resistance

.6 Forced entry resistance

.7 Insect screens
.8 Glazing
.9 Safety drop - vertical sliding windows only
.10 Sash strength and stiffness
.11 Ease of operation - windows with operable lights
.12 Mullion deflection - combination and composite windows
.13 Clear Anodized finish
.14 Block operation - sliding windows only

1.4 CLOSEOUT SUBMITTALS

.1 Provide operation and maintenance data for windows for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.5 WARRANTY

.1 Provide a written warranty for work under this section from manufacturer for failure due to defective materials and from contractor for failure due to defective installation and workmanship, for five (5) years respectively from the date of Substantial Completion.

1.6 MOCK-UP

.1 Construct mock-up in accordance with Section 01 45 00 – Quality Control.

.2 Construct mock-up showing typical window and spandrel section installed in wall opening. Accepted mock-up may form part of complete work.

.3 Allow two (2) working days for inspection of mock-up by Departmental Representative's Representative before proceeding with window work.

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

PART 2 - PRODUCTS

2.1 MATERIALS

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

.2 All aluminum windows by same manufacturer.

.3 Sash: aluminum thermally broken.

.4 Main frame: aluminum thermally broken, sized to accept triple glazing.

.5 Glass: in accordance with Section 08 80 50 – Glazing.

.6 Screens: to CAN/CGSB-79.1.

.1 Insect screening mesh: count 18 x 14

.2 Fasteners: tamper proof

.3 Screen frames: aluminum, colour to match window frames

.4 Mount screen frames for exterior replacement.

.5 Provide screens to cover operable portion of window.

.7 Exterior metal sills: extruded aluminum of type and size to suit job conditions; minimum 3 mm thick, complete with joint covers, jamb drip deflectors, chairs, anchors, anchoring devices.

.8 Isolation coating: alkali resistant bituminous paint.

2.2 WINDOW TYPE AND CLASSIFICATION

.1 Types:

.1 Single hung, top vented, bottom position fixed, insulating glass.

.2 Single hung, bottom vented, top position fixed, insulating glass.

.3 Fixed: with insulating glass.

.4 Screens: full insect screens as indicated.

.2 Classification rating: to CSA-A440/A440.1 for various regions of Newfoundland and Labrador as follows:

.1 Wabush A3, B2, C2, I43, F1, S1

.3 Energy ratings: windows to be Energy Star certified to Natural Resources Canada Climate Zones for various regions of Newfoundland and Labrador as follows:

.1 Northern Part of Northern Peninsula and all of Labrador

.1 Zone 3 (>= 6000 HHDs)

2.3 FABRICATION

.1 Fabricate in accordance with CSA-A440/A440.1 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 3.0 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 380 g/m² zinc coating to CAN/CGSB-1.40.

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 to No.17 finish conforming to Standard AA-M12C2231, Class 1 finish.

2.5 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.

2.6 GLAZING

.1 Glaze windows in accordance with CSA-A440/A440.1 and Section 08 80 50 - Glazing.

2.7 AIR BARRIER AND VAPOUR RETARDER

.1 Provide low expanding, single component polyurethane foam sealant installed at head, jamb and sill perimeter of window for sealing to building air barrier, vapour retarder and window frame. Foam sealant width to be adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder foam interior. Refer to Section 07 21 20 – Low Expanding Foam Sealant.

PART 3 - EXECUTION

3.1 WINDOW INSTALLATION

.1 Install in accordance with CSA-A440.

.2 Arrange components to prevent abrupt variation in colour.

.3 Install shims between windows and building frame at each installation screw location. Shim and fasten windows in accordance with manufacturer’s recommendations and CAN/CSA A440.4.

3.2 SILL INSTALLATION

.1 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.

.2 Cut sills to fit window opening.

.3 Secure sills in place with anchoring devices located at ends joints of continuous sills and evenly spaced 600 mm oc in between.

.4 Fabricate and install sills to provide minimum 2% slope away from window.

.5 Fasten drip deflectors with self tapping stainless steel screws.

.6 Maintain 6.0 to 9.0 mm space between butt ends of continuous sills. For sills over 1200 mm in length, maintain 3.0 to 6.0 mm space at each end.

3.3 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 Sealants. Conceal sealant within window units except where exposed use is permitted by Departmental Representative's Representative.

3.4 TESTING

.1 Air leakage testing may be provide by the Departmental Representative's Representative and will be performed by professional testing agency for three locations selected at random for window/wall assembly.

.2 Window/wall assembly will include foundations, steel stud structure, gypsum sheathing and air barrier with on 1500 x 1500 window installed and sealed in place. (Omit spandrel panel for this exercise). Construct a test chamber on the exterior, from approximately 3100 high x approximately 3000 wide, sealed to foundation wall and face of air barrier on gypsum board. Provide mechanical anchorage to resist air pressure. Use a fan mounted in a door to achieve negative and positive pressures of 75 Pa. Use a smoke pencil to test for leaks. Total air leakage shall be less than 0.25 L/sec. for the tested assembly after accounting for leakage in the test chamber.

.3 Testing will be witnessed by Departmental Representative's Representative and test reports will be signed by Tester, Site Representative and Contractor.

.4 Inform Departmental Representative's Representative two (2) working days prior to required testing.

END

PART 1 - GENERAL

1.1 RELATED SECTIONS

.1 Section 01 33 00 - Submittal Procedures.

.2 Section 01 61 00 - Common Product Requirements.

.3 Section 01 74 21 – Construction/Demolition Waste Management and Disposal.

.4 Section 01 78 00 - Closeout Submittals.

.5 Division 26 - Electrical wiring for magnetic strikes, electric releases, electric locks.

1.2 REFERENCES

.1 American National Standards Institute (ANSI) / Builders Hardware Manufacturers Association (BHMA)

.1 ANSI/BHMA A156.1, American National Standard for Butts and Hinges.
.2 ANSI/BHMA A156.2, Bored and Preassembled Locks and Latches.
.3 ANSI/BHMA A156.3, Exit Devices.
.4 ANSI/BHMA A156.4, Door Controls - Closers.
.5 ANSI/BHMA A156.5, Auxiliary Locks and Associated Products.
.6 ANSI/BHMA A156.6, Architectural Door Trim.
.7 ANSI/BHMA A156.8, Door Controls - Overhead Stops and Holders.
.8 ANSI/BHMA A156.12, Interconnected Locks and Latches.
.9 ANSI/BHMA A156.13, Mortise Locks and Latches Series 1000.
.10 ANSI/BHMA A156.14, Sliding and Folding Door Hardware.
.11 ANSI/BHMA A156.15, Release Devices - Closer Holder, Electromagnetic and Electromechanical.
.12 ANSI/BHMA A156.16, Auxiliary Hardware.
.13 ANSI/BHMA A156.17, Self-closing Hinges and Pivots.
.14 ANSI/BHMA A156.18, Materials and Finishes.
.15 ANSI/BHMA A156.19, Power Assist and Low Energy Power - Operated Doors.

.2 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA)

.1 CSDFMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.

1.3 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet.

.2 Samples:

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

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

.3 Hardware List:

.1 Submit contract hardware list.

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

.4 Manufacturer's Instructions:

.1 Submit manufacturer's installation instructions.

.5 Closeout Submittals

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

1.4 MAINTENANCE MATERIALS

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

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

1.5 WARRANTY

.1 Provide a written manufacturer’s warranty for work of this Section for failure due to defective materials for ten (10) years, dated from substantial completion certificate.

.2 Provide a written Contractor’s warranty for work of this Section for failure due to defective installation workmanship for one (1) year, dated from submittal completion certificate.

1.6 QUALITY ASSURANCE

.1 Regulatory Requirements:

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

.2 Only products meeting ANSI/BHMA standards are acceptable. Items that are equal in design, function and quality will be accepted upon approval of the Departmental Representative’s Representative.

.3 Only recognized contract hardware distributors will be considered for the work of this section. The distributor shall have on staff a qualified Architectural Hardware Consultant

recognized by the Door and Hardware Institute or a person with equivalent qualifications to assist installers and direct detailing, processing and delivery of material, and certify installation acceptance.

1.7 DELIVERY, STORAGE, AND HANDLING

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

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

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

1.8 MAINTENANCE SERVICE

.1 Provide maintenance service for one year during warranty period to maintain all barrier free entrance automatic operators as follows:

.1 Qualified service personal approved by manufacturer of operators.

.2 Site inspection every three months will all necessary adjustment made during this visit. Separate warranty service calls, if required, will only qualify as an inspection if time of call is close to the three-month intervals.

.3 Make detailed reports of each visit and copy to Departmental Representative and Engineer.

.4 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 door locksets and latches listed on ANSI/BHMA Standards list are acceptable for use on this project.

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

2.2 DOOR HARDWARE

.1 Locks and latches:

.1 Bored and preassembled locks and latches: to ANSI/BHMA A156.2, 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.

.2 Mortise locks and latches: to ANSI/BHMA A156.3, series 1000 mortise lock, designed for function and keyed as stated in Hardware Schedule.

.3 Knobs Lever handles: plain design.

.4 Roses: round.

.5 Normal strikes: box type, lip projection not beyond jamb.

.6 Cylinders: key into keying system as directed.

.7 All corresponding cylinders to be removable.

.8 Finished to BHMA 626.

.9 Dorma M9000/C800 Series

.2 Butts and hinges:

.1 Butts and hinges: to ANSI/BHMA A156.1, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

.2 PBB BB Series

.3 Exit devices:

.1 to ANSI/BHMA A156.3, function, grade and finish as per schedule. Rim, Vertical Rod type with push pad design.

.2 Dorma 9000 Series

.4 Door Closers and Accessories:

.1 Door controls (closers): to ANSI/BHMA A156.4, designated by letter C and numeral identifiers listed in Hardware Schedule.

.2 Dorma 8900/8600 Series

.5 Door Operators:

.1 Low Energy Operators: CAN/CGSB-69.26 / ANSI A156.19, Grade 1, surface applied power assist and low energy power operated doors.

.2 Operators shall be completed with all components.

.3 Controls shall include adjustable time delay and safe-swing circuit.

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

.5 Compliant with UL10C for positive pressure.

.6 Power requirements: 120 VAC, 50/60 Hz, 2 amps (single dedicated line).

.7 Automatic Operators items to be performed by AAADM certified and Manufacturer authorized personnel including connection to hardware products installed by others.

.8 Hardware groups lists the intent and function of the opening however supplier is to include for any and all additional components required to properly operate the doors as required. In the event, additional components are required they shall be added at no additional cost to the Departmental Representative.

.9 Dorma ED400/700

.6 Card Access Control Systems:

.1 The access control specification is based on Keyscan / RCI hardware, as requested by the Departmental Representative. Refer to Keyscan operating and installation manuals for complete specification and power requirements.

.2 Prior to shop drawing submittals arrange a System Review meeting with the Departmental Representative, Manufacture and Installers to establish final function and operation of each opening, confirm all electrical requirements and confirm all details and operation of this system.

.3 Equipment shall be complete with all relays and devices to operate as needed.

.4 Provide necessary cables and equipment to connect to Departmental Representatives computer located in Departmental Representative's choice of locations.

.5 Hardware groups list the intent and function of the opening however include for any additional components relays and power supplies required to properly operate all hardware devices, door control devices, remote control devices and any special cables or wiring to connect all parts to the system.

.6 Manufacture representative to visit job site at completion of all connections to ensure that system is working properly and instruct Departmental Representatives representative in the complete operation and capabilities of the system.

.7 The card system power supply must have a battery back-up.

.8 The power supply must be able to provide a relay to notify the system when there is a loss of AC power.

.9 High voltage wiring and connection to power supply locations and conduit to all door locations to be supplied by Division 26.

.10 Low voltage wiring at each required door opening shall be of proper quantity and gauge for distance to operating products.

.11 When different voltages are required to operate electrical hardware items this supplier is to ensure all modifications are made and relays provided to operate such hardware.

.12 Connections to hardware items to be made by installers of the access control equipment.

.13 Complete wiring diagrams and operating instructions of the system shall be provided to the Contractor to ensure other Trades are made aware of this equipment as to location and wiring requirements.

.14 Provide 200 access K-Smartcards to suit specified card readers.

.15 Provide AURORA Software Package

.16 Provide necessary Communications Line Drivers.

.17 Provide necessary Site Controllers.

.18 Provide Communication Interlink Module.

.19 Provide TCP/IP Plug Communication Adaptor.

.20 Provide necessary Power supplies to suit project requirements.

.7 Power Supplies:

.1 Security ULC listed Grade 1 type devices.

.2 Field selectable 12/24VDC with filtered and regulated outputs.

.3 Power supplies shall be concealed in ceiling space or suitable adjacent area.

.4 Power supplies shall interface with all electrical security components and supplied complete with all relays, battery backup systems and devices to operate as per the notes with each Hardware Group.

.5 Provide battery back-up for eight hours.

.6 Provide fire disconnect where necessary.

.7 Limited lifetime warranty.

.8 Approved products: RCI, Dorma

.8 Electrified Hardware:

.1 Electrified Strikes to be heavy duty design with 12/24V, 500lbf, ULC

.2 Maglocks to be heavy duty design with 12/24V, 1500lbf, UL10C

.9 Auxiliary locks and associated products: to ANSI/BHMA A156.5, designated by letter E and numeral identifiers listed in Hardware Schedule.

.1 Key into keying system as noted.

.10 Architectural door trim: to ANSI/BHMA A156.6, designated by letter J and numeral identifiers listed in Hardware Schedule.

.1 Door protection plates: 1.27 mm thick stainless steel, finished to BMHA 630.

.2 Push plates: 1.27 mm thick stainless steel finished to BMHA 630.

.3 Push/Pull units: type stainless steel finished to BMHA 630.

.11 Auxiliary hardware: to ANSI/BHMA A156.16, designated by letter L and numeral identifiers listed in Hardware Schedule.

.1 Combination stop and holder, floor mounted: finished to BMHA 626.

.2 Surface bolt lever extension flush bolt: finish to BMHA 626.

.12 Door bottom seal: heavy duty, door seal of extruded aluminum frame and hollow closed cell neoprene weather seal, surface mounted with drip cap closed ends, clear anodized finish.

.13 Thresholds: to ANSI/BHMA A156.21 extruded aluminum mill finish, serrated surface, with lip and vinyl door seal insert.

.14 Weatherstripping:

.1 Head and jamb seal:

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

.15 Astragal: overlapping, extruded aluminum frame with vinyl insert, finished to match doors.

2.3 KEY CABINET

.1 Provide one wall mounted steel key cabinet with capacity for 1.5 times the number of keys with an indexed key control system to ANSI/BHMA A156.5.

2.4 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.

2.5 KEYING

.1 Doors, padlocks and cabinet locks to be master keyed as directed. Prepare detailed keying schedule in conjunction with Departmental Representative’s Representative and Departmental Representative.

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

.3 Provide six master keys for each MK or GMK group. Allow for six (6) levels of sub master keying.

.4 Stamp keying code numbers on keys and cylinders.

.5 Provide construction SFIC cores and 15 construction keys for the project.

.6 Provide all permanent SFIC Dorma SCK D100 cores and keys to Departmental Representative's Representative.

.7 Supply fifty (50) blanks for each sub master group used.

2.6 FINISHES

.1 Following finishes are indicated in hardware groups.

BHMA	CAN	MATERIAL	FINISH
626	C26D	Brass/Bronze	Satin Chrome
628	C28	Aluminum	Satin Alum, Anodized
630	C32D	Stainless Steel	Satin Stainless Steel
652	C26D	Steel	Plated Satin Chrome
689	Al	All	Painted Aluminum
Alum		Aluminum	Mill Finish
TMDFF (to match door and frame finish).			

2.7 ABBREVIATIONS

ALD Aluminum Door and Frame
ATMS STMS Arm/strike To Template with Machine Screws
ASB Arm Complete with Sex Bolts
BC Back Check
C to C, C/L Centerline to Centerline
Cyl Cylinder (of a lock)
CMK Construction Master Key
Deg. Degree (of opening)
DEL Delayed Action
FBB or BB Ball bearing hinge

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.

3.2 INSTALLATION

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

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

.3 Install key control cabinet.

.4 Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.

.5 Remove construction when directed by Departmental Representative’s Representative; install permanent cores and check operation of locks.

.6 Wiring Diagrams:

.1 Provide any special information, voltage requirements and wiring diagrams to other trades requiring such information.

3.3 EXAMINATION

.1 Visit site prior to start of installation of hardware.

.2 Visit will include examination of openings, site conditions and materials for conditions that prevent proper application of finish hardware.

.3 Installation will imply conditions for installation acceptable hardware contractor to accept responsibility.

3.4 FIELD QUALITY CONTROL

.1 Hardware contractor to have a qualified AHC representative from the manufacturer/supplier on site at Substantial Completion Inspection and at commissioning of the finished hardware. Cost of the visits to be included in contract.

3.5 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 Where hardware is found defective, repair or replace or correct as desired by inspection reports.

3.6 CLEANING

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

.2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.

.3 Remove protective material from hardware items where present.

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

3.7 PROTECTION

.1 All hardware shall be protected against damage from paint, plaster or other defacing materials. Whenever possible manufacturers protective covering when applied, shall not be removed until final project cleaning takes place. Material not protected by manufacture shall be covered or removed from door during painting or any other adjustments that can cause damage to hardware.

3.8 HARDWARE GROUPS

.1 Provide hardware as specified in the previous articles in sets according to the following groups:

Hardware Group 1 (exterior main entry sliding doorway)
1-Full Breakout Automatic Door System Dorma ESA300 x Breakout Panel (glass not inc.)
1-Mortise Cylinder Dorma 97 626 (SFIC-D100 MKD)
1-Keyswitch RCI 960MA-DMA 28
2-Sensing Devices Dorma DX3343-010
1-Threshold Draftseal DS5000 sized to suit

Hardware Group 2 (exterior entry doorway)
1-Continous Hinge ABH A110 HD C (sized to suit)
1-Exit Device Dorma 9700 ZC08 630 (SFIC-D100 MKD)
1-OH Stop ABH 1020SL 32D
1-Auto Operator Dorma ED400 Al
2-Push Buttons Dorma DX3339-030
1-Mortise Cylinder Dorma 97 626 (SFIC-D100 MKD)
1-Keyswitch RCI 960MA 28
1-Electric Strike RCI 0162 32D
1-Door Position Switch RCI 9540B (tied into Keyscan security)
1-Threshold DS5000 C (sized to suit)
1-Weather Seal DS130C (sized to suit)
1-Door Sweep DS148C (sized to suit)

Hardware Group 3 (exterior entry doorway)
1-Continous Hinge ABH A110 HD C (sized to suit)
1-Exit Device Dorma 9700 ZC08 630 (SFIC-D100 MKD)
1-OH Stop ABH 1020SL 32D

1-Door Closer Dorma 8916 AF89J BP89 689
1-Door Position Switch RCI 9540B (tied into Keyscan security)
1-Threshold DS5000 C (sized to suit)
1-Weather Seal DS130C (sized to suit)
1-Door Sweep DS148C (sized to suit)

Hardware Group 4 (exterior entry to mechanical room)
1-Continous Hinge LS300 630 (sized to suit)
1-Continous Hinge LS300PT 630 (sized to suit)
2-Flush Bolts ABH 1855S x 1870/72 Strikes
1-Lockset Dorma M9080EURX LCA 626 (SFIC-D100 MKD)
1-Door Closer Dorma 8916 AF89J BP89 689
2-OH Stops ABH 1020SL 32D
1-Power Transfer Dorma ES105 32D
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Door Position Switch RCI 9540B (tied into Keyscan security)
2-Kickplates CBH 903 32D (12in x sized to suit)
1-Threshold DS5000 C (sized to suit)
1-Weather Seal DS130C (sized to suit)
1-Astrigal DS186 (sized to suit)
2-Door Sweeps DS161 (sized to suit)

Hardware Group 5 (vestibule main entry sliding doorway)
1-Full Breakout Automatic Door System Dorma ESA300 x Breakout Panel
1-Mortise Cylinder Dorma 97 626 (SFIC-D100 MKD)
1-Keyswitch RCI 960MA-DMA 28
2-Sensing Devices Dorma DX3343-010

Hardware Group 6 (vestibule entry doorway)
1-Continous Hinge ABH A110 HD C (sized to suit)
1-Push/Pull Device Dorma 9235 ZC02R 630
1-OH Stop ABH 1020SL 32D
1-Auto Operator Dorma ED700 Al
2-Push Buttons Dorma DX3339-030

Hardware Group 7 (stairway door)
3-Hinges PBB BB81 4-1/2x4 652
1-Exit Device Dorma F9300 YC23 630
1-Auto Operator Dorma ED700 Al
2-Push Buttons Dorma DX3339-030
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 8 (office door)
3-Hinges PBB BB81 4-1/2x4 652
1-Lockset M9053 LCA 626 (SFIC-D100 MKD, lock can be set in passage mode)
1-Door Closer Dorma 8616 AF86P 689
1-Electric Strike RCI F2614 LM 32D
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)

1-Request to Exit Sensor RCI 915
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Hardware Group 9 (ticket room)
3-Hinges PBB BB81 4-1/2x4 652
1-Passage Set M9010 LCA 626
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Hardware Group 10 (washroom)
3-Hinges PBB BB81 4-1/2x4 652
1-Privacy Indicator Lock M9996 LCA x 79022 626
1-Kickplate CBH 903 32D (8in x sized to suit)
1-OH Stop ABH 9020S 32D
1-Sound Seal D44B (sized to suit)
1-Auto Door Bottom Sound Seal DS335R (sized to suit)

Hardware Group 11 (mech/storage/general room)
3-Hinges PBB BB81 4-1/2x4 652
1-Lockset M9080 LCA 626
1-Door Closer 8616 AF89P 689
1-Electric Strike RCI F2614 LM 32D
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Request to Exit Sensor RCI 915
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 12 (stairway/vest door)
3-Hinges PBB BB81 4-1/2x4 652
1-Exit Device Dorma F9300 YC23 630
1-Door Closer 8916 AF89P 689
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 13 (stairway door)
3-Hinges PBB BB81 4-1/2x4 652
1-Exit Device Dorma F9300 YC08 630 (SFIC-D100 MKD)
1-Door Closer 8916 AF89P 689
1-Electric Strike F0162 LM 32D
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Request to Exit Sensor RCI 915
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 14 (roof access)
1-Continous Hinge LS300 630 (sized to suit)

1-Passage Set Dorma M9010 LCA 626
1-Door Closer Dorma 8916 AF89J BP89 689
1-OH Stop ABH 1020SL 32D
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Kickplate CBH 903 32D (12in x sized to suit)
1-Inswing Sill DS5500AVT x DS5500GSKETR x DS5500GSKETL (sized to suit)
1-Inswing Sill Weatheseal DS420 (sized to suit)
1-Weather Seal DS130C (sized to suit)
1-Automatic Door Bottom DS344AN (sized to suit)
1-Door Sweep DS136N (sized to suit)

Hardware Group 15 (office area)
1-Sliding Door Track Fascia KT47C (sized to suit)
1-Sliding Door Track KT47TRACK (sized to suit)
6-Door Hangers KT40HANGER (2 per door)
4-Bumper Stops KT125
6-Floor Mount Roller Guides KT127SS2
3-Door Roller Guide Track KT23 (1 per door, sized to suit)
2-Door Pulls CBH 7010 32D

Hardware Group 16 (general access control door)
6-Hinges PBB BB81 4-1/2x4 652
2-Flush Bolts ABH 1855S x 1870/72 Strikes
1-Lockset Dorma M9010 LCA 626
1-Door Closer Dorma 8616 SIS 689
1-OH Stop ABH 1020 32D
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
2-Door Position Switches RCI 9540B
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 17 (ticket room)
1-Pocket Door Track KT40TRACK
1-Pocket Door Kit KT40HDKIT
1-Pocket Door Passage Set KT178DCH

Hardware Group 18 (closet doors)
1-Sliding Door Track Fascia KT47C (sized to suit)
1-Sliding Door Track KT47TRACK (sized to suit)
2-Door Hangers KT40HANGER
2-Bumper Stops KT125
2-Floor Mount Roller Guides KT127SS2
1-Door Roller Guide Track KT23 (sized to suit)
2-Door Pulls CBH 7010 32D

Hardware Group 19 (meeting/security room)
1-Floating Header Assembly Dorma 233.418 700 (sized and prepped to suit)
1-Locking Exit Bar Dorma DG1000P TB D ES1 P 700 SEDC C (SFIC-D100 MKD)
1-Top Rail Dorma 225.001 700 (sized and prepped to suit)
1-Bottom Rail Dorma 225.006 700 (sized to suit)
1-Glass Wall Partition Top Channel Dorma 925.071 700 (sized to suit)
1-Glass Wall Partition Bottom Channel Dorma 225.201 700 (sized to suit)
1-Glass Wall Partition Saddle Dorma 925.049 100 (sized length of bottom channel)
1-Channel Gasket 925.147 (sized to suit, requires gasket on both sides top channel only)
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Request to Exit Sensor RCI 915
1-Door Position Switch RCI 9540B

Hardware Group 20 (storage room)
6-Hinges PBB BB81 4-1/2x4 652
2-Flush Bolts ABH 1855S x 1870/72 Strikes
1-Lockset Dorma M9010 LCA 626
1-Door Closer Dorma 8616 SIS 689
1-OH Stop ABH 1020 32D
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
2-Kickplates CBH 903 32D (8in x sized to suit)
2-Meeting Styles Draftseal DS163C (sized to suit)
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 21 (exterior entry doorway)
2-Continous Hinges ABH A110 HD C (sized to suit)
2-Exit Devices Dorma CD9600 ZC08 630 (SFIC-D100 MKD)
2-Door Closers 8916 AF89J BP89 689
2-OH Stops ABH 1020SL 32D
2-Door Position Switches RCI 9540B (tied into Keyscan security)
1-Threshold DS5000 C (sized to suit)
1-Weather Seal DS130C (sized to suit)
2-Meeting Styles DS148CNB (sized to suit)
2-Door Sweeps DS148C (sized to suit)

Hardware Group 22 (exterior entry doorway, two single doors)
2-Continous Hinges ABH A110 HD C (sized to suit)
2-Exit Devices Dorma 9700 ZC09 630 (SFIC-D100 MKD)
2-Door Closers 8916 AF89J BP89 689
2-OH Stops ABH 1020SL 32D
2-Maglocks RCI DSS/SCS 8310 32D
2-Electric Strikes RCI 0162 LM 32D
2-Emergency Pull Stations RCI 940PB
2-Egress Release Switches Keyscan K-Smart
2-Power Supplies RCI 10-1FPD
4-Card Readers Keyscan K-Smartcard

4-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
2-Thresholds DS5000 C (sized to suit)
2-Weather Seals DS130C (sized to suit)
2-Door Sweeps DS148C (sized to suit)

Hardware Group 23 (exterior entry doorway)
1-Continous Hinge LS300 630 (sized to suit)
1-Exit Device Dorma 9300 YC09 630 (SFIC-D100 MKD)
1-Door Closer 8916 AF89J BP89 689
1-OH Stop ABH 1020SL 32D
1-Maglock RCI 8310 DSS/SCS 32D
1-Electric Strike RCI 0162LM 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Kickplate CBH 903 32D (12in x sized to suit)
1-Threshold DS5000 C (sized to suit)
1-Weather Seal DS130C (sized to suit)
1-Door Sweep DS148C (sized to suit)

Hardware Group 24 (exterior entry doorway)
1-Continous Hinge LS300 630 (sized to suit)
1-Exit Device Dorma CD9300 ZC08 630 (SFIC-D100 MKD)
1-OH Stop ABH 1020SL 32D
1-Door Closer Dorma 8916 AF89J BP89 689
1-Door Position Switch RCI 9540B (tied into Keyscan security)
1-Kickplate CBH 903 32D (12in x sized to suit)
1-Threshold DS5000 C (sized to suit)
1-Weather Seal DS130C (sized to suit)
1-Door Sweep DS148C (sized to suit)

Hardware Group 25 (glass wall partition)
1-Glass Wall Partition Top Channel Dorma 925.071 700 (sized to suit)
1-Glass Wall Partition Bottom Channel Dorma 925.072 700 (sized to suit)
1-Channel Gasket 925.147 (sized to suit, requires gasket on both sides of glass channel)

Hardware Group 26 (departure lounge entry)
3-Hinges PBB BB81 4-1/2 x 4 652
1-Exit Device Dorma 9300 YC23 630
1-Automatic Operator Dorma ED700 AL
1-Maglock RCI 8310 DSS/SCS 32D
1-Electric Strike 0162LM 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Hardware Group 27 (secure vest door)

3-Hinges PBB BB81 4-1/2x4 652
1-Exit Device Dorma 9300 YC23 630
1-Door Closer 8916 AF89P 689
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard c/w 10 Smartcards
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Hardware Group 28 (vest entry doorway)
1-Continous Hinge ABH A110 HD C (sized to suit)
1-Exit Devices Dorma 9700 ZC23 630
1-Door Closers 8916 AF89J BP89 689
1-OH Stop ABH 1020SL 32D
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Egress Release Switch Keyscan K-Smart
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)

Hardware Group 29 (arrival vest doorway)
2-Continous Hinges ABH A110 HD C (sized to suit)
2-Exit Devices Dorma 9600 ZC23 630
2-Door Closers 8916 AF89J BP89 689
2-OH Stops ABH 1020SL 32D
2-Maglocks RCI 8320 DSS/SCS32D
1-Emergency Pull Station RCI 940PB
1-Egress Release Switches Keyscan K-Smart
1-Power Supplies RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)

Hardware Group 30 (storage/general room)
3-Hinges PBB BB81 4-1/2x4 652
1-Lockset M9070 LCA 626 (SFIC-D100 MKD)
1-Kickplate CBH 903 32D (8in x sized to suit)
1-OH Stop ABH 1020S 32D

Hardware Group 31 (storage/general access control room)
6-Hinges PBB BB81 4-1/2x4 652
2-Flush Bolts ABH 1855S x 1870/72 Strikes
1-Lockset Dorma M9080EURX LCA 626 (SFIC-D100 MKD)
1-Door Closer Dorma 8616 SIS 689
1-OH Stop ABH 1020 32D
1-Power Transfer Dorma ES105 32D
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)

1-Door Position Switch RCI 9540B (tied into Keyscan security)
2-Kickplates CBH 903 32D (8in x sized to suit)
2-Meeting Styles Draftseal DS163C (sized to suit)
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 32 (kitchen/lounge)
3-Hinges PBB BB81 4-1/2x4 652
1-Door Pull CBH 7430 32D
1-Push Plate CBH 930 32D (4 x 16)
1-Door Closer 8616 AF86P 689
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Hardware Group 33 (sliding glass window)
1-Sliding Window Assembly Dorma 207.055 700 (sized to suit, glass not included)

Hardware Group 34 (general access control door)
3-Hinges PBB BB81 4-1/2x4 652
1-Lockset Dorma M9010 LCA 626
1-Door Closer Dorma 8616 SIS 689
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 35 (jan room)
6-Hinges PBB BB81 4-1/2x4 652
2-Flush Bolts ABH 1855S x 1870/72 Strikes
1-Lockset M9070 LCA 626 (SFIC-D100 MKD)
2-Kickplates CBH 903 32D (8in x sized to suit)
2-OH Stops ABH 1020S 32D

Hardware Group 36 (secure stairway)
3-Hinges PBB BB81 4-1/2x4 652
1-Exit Device Dorma DE9300 YC09 630 (SFIC-D100 MKD)
1-Door Closer 8616 AF89P 689
1-Electric Strike RCI F0162 LM 32D
1-Power Transfer Dorma ES105 32D
1-Power Supply Dorma ES100
2-Card Readers Keyscan K-Smartcard c/w
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Request to Exit Sensor RCI 915
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D
1-Smokeseal Draftseal DS44 (sized to suit)

Hardware Group 37 (office door)
6-Hinges PBB BB81 4-1/2x4 652
2-Flush Bolts ABH 1855S x 1870/72 Strikes

1-Lockset M9053 LCA 626 (SFIC-D100 MKD, lock can be set in passage mode)
1-Door Closer Dorma 8616 AF86P 689
1-Electric Strike RCI F2614 LM 32D
1-Power Transfer Dorma ES105 32D
1-Card Reader Keyscan K-Smartcard
1-Controller/Power Supply Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Request to Exit Sensor RCI 915
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Hardware Group 38 (washroom)
3-Hinges PBB BB81 4-1/2x4 652
1-Privacy Indicator Lock M9996 LCA x 79022 626
1-Automatic Operator Dorma ED700
1-Electric Strike RCI F2164 LM 32D
2-Push Buttons Dorma DX3339-030
1-Kickplate CBH 903 32D (8in x sized to suit)
1-OH Stop ABH 9020S 32D
1-Sound Seal D44B (sized to suit)
1-Auto Door Bottom Sound Seal DS335R (sized to suit)

Hardware Group 39 (kitchen/lounge)
1-Double Acting Pivot/Closer Set Dorma RTS04 32D
2-Push Plates CBH 930 32D (4 x 16)
2-Protective Plates CBH 903 32D (8in x sized to suit)
2-Floor Stops CBH 157 26D

Hardware Group 40 (secure vest door)
1-Continous Hinge ABH A110 HD C (sized to suit)
1-Exit Device Dorma 9700 ZC23 630
1-Door Closer 8916 AF89P 689
1-Maglock RCI 8310 DSS/SCS 32D
1-Emergency Pull Station RCI 940PB
1-Power Supply RCI 10-1FPD
2-Card Readers Keyscan K-Smartcard c/w 10 Smartcards
2-Controller/Power Supplies Keyscan 8 Door Controller (used for a combination of 8 access controlled opening, mounted in secure location)
1-Kickplate CBH 903 32D (8in x sized to suit)
1-Floor Stop CBH 157 26D

Door Number and Hardware Group Schedule

Door #	**HG#**
X01	1
X02	2
X03	3
X04	1
X05	4
X06	NA
X07	NA
X08	21
X09	21
X10	22

X11	23
X12	NA
X13	23
X14	NA
X15	24
X16	NA
X16A	NA
X16B	23
X17	23
X18	NA
X19	24
X20	2
X19	14
X21	14
X22	14
X23	14
X24	14
100	5
101	11
102	25
103	7
104	19
105	19
106	6
107	9
107A	17
108	9
109	9
109A	17
110	9
111	9
111A	17
112	9
113	26
114	8
115	27
115A	12
117	EXISTING
117A	8
118	40
119	38
120	28
120A	28
120B	25
122	29
123	29
124	28
125	12
125A	NA
125B	NA
125C	30
126	20
126A	30
127	18

128	18
129	11
130	30
131	31
131A	11
132	11
133	11
134	30
135	30
136	5
138	11
141	39
143	30
144	32
145	10
146	35
147	25
148	18
149	8
150	8
151	8
152	8
153	37
153A	16
154	16
155	8
156	8
157	8
157A	34
159	10
161	8
162	12
164	36
165	30
167	34
167A	34
168	11
169	11
170	10
171	34
172	34
173	30
174	31
174B	11
200	13
201	11
204	EXISTING
205	32
206	EXISTING
206A	EXISTING
208	10
209	10
210	8
211	8

212	8
213	8
214	13
215	8
216	15
217	8
218	11
219	11
221	EXISTING
221A	8
221B	EXISTING
222	8
223	11
224	EXISTING

3.9 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's Representative.

.2 Designated Staff Briefing:

.1 Brief designated staff regarding:

.1 Proper care, cleaning, and general maintenance of projects complete hardware.

.2 Description, use, handling, and storage of keys.

.3 Use, application and storage of wrenches for door closers, locksets, and fire exit hardware.

.3 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

3.10 COMMISSIONING

.1 Site inspection or visit at Substantial Completion and training follow up and inspection at commissioning as directed by Departmental Representative's Representative.

.2 Provide 10 month warranty service.

END

PART 1 - GENERAL

1.1 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

.2 American Society for Testing and Materials International (ASTM):
- .1 ASTM C542-05(2011), Standard Specification for Lock-Strip Gaskets
- .2 ASTM E330/E330M-14, Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.3 Canadian General Standards Board:
- .1 CAN/CGSB 12.1-M90, Tempered or Laminated Safety Glass
- .2 CAN/CGSB 12.8-97, Insulating Glass Units
- .3 CAN/CGSB 12.11-M90, Wired Safety Glass
- .4 CAN/CGSB-12.20-M89 - Structural Design of Glass for Buildings

.4 Flat Glass Marketing Association (FGMA) Glazing Manual

.5 Laminators Safety Glass Association - Standards Manual

.6 Glass Association of North America (GANA):
- .1 Glazing Manual IGMAC
- .2 FGMA Sealant Manual

.7 Underwriters Laboratories of Canada (ULC):
- .1 ULC Standard CAN4-S104: Fire Tests of Door Assemblies.
- .2 ULC Standard CAN4-S106: Fire Tests of Window Assemblies.

1.2 SUBMITTALS

.1 Product Data:
- .1 Submit manufacturer's printed product literature, including installation instructions, MSDS sheets, specifications and data sheets in accordance with Division 01, Submittal Procedures.

.2 Samples:
- .1 Submit sample of exterior sealed units
- .2 Submit sample of frosted film 200 mm x 200 mm.
- .3 Submit samples of glazing in structural sealant glazing frame.

1.3 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials.

.2 Maintain ventilated environment for twenty-four (24) hours after application.

.3 Maintain minimum ambient temperature before, during and twenty-four (24) hours after installation of glazing compounds.

.4 Follow Indoor Air Quality (IAQ) Plan requirements in accordance with Division 01, Indoor Environmental Protection and Sustainability Requirements.
- .1 Work scheduling requirements must be followed for compliance.

1.4 WASTE MANAGEMENT

.1 Separate and recycle waste materials in accordance with Division 01, Construction Waste Management and Disposal and project Construction Waste Management Plan.
- .1 A Waste Trip Log Form must be completed and submitted for all waste material removed from site.
- .2 Weigh-bills from receiving facilities, which support the Waste Trip Log Form, must also be submitted.

1.5 PERFORMANCE CRITERIA

.1 Provide continuity of building enclosure, vapour retarder and air barrier using glass and glazing systems:
- .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 in accordance with ASTM E330 and as per NBC 2010.

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

.4 Provide pressure equalized glazing systems.

1.6 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Deliver and store materials in compliance with Division 01, Common Product Requirements.

.2 Comply with manufacturer’s recommendations for handling, storage and protection during installation.

.3 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.4 Label packages to include material name, production date and/or product code.

1.7 QUALITY ASSURANCE/QUALITY CONTROL

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

1.8 EXTENDED WARRANTY

.1 Exterior Sealed Unit: Provide extended manufacturer's warranty for glazing systems to ten (10) years following date of substantial completion.
- .1 Defective work shall include, but shall not be restricted to, breakage (other than by accidental blows) and loss of seal.
- .2 At sealed units fogging of glass inside seal will be considered sufficient evidence of loss of seal.

PART 2 - PRODUCTS

2.1 EXTERIOR GLAZING

.1 (**GL1**) Exterior Sealed Units: to CAN/CGSB 12.8:
- .1 Double glazed units with low conductance warm edge spacer
- .2 Thickness of glass panels: 6 mm thickness. Total thickness of sealed unit: 25 mm
- .3 Colour: Clear
- .4 Light transmittance: 69%
- .5 Shading coefficient: 0.46
- .6 Argon Gas filled sealed units:
- .7 Winter u/v (Argon): 1.4
- .8 Summer u/v (Argon): 1.2
- .9 Reflectance: 11% out and in
- .10 Solar: 29%
- .11 Tempered
- .12 Standard of Acceptance based on Cardinal LoE2 272 on clear.
- .13 Acceptable Alternate Product: PPG, Solarban 60

.2 (GL2) Glass Exterior Sealed Units: to CAN/CGSB 12.8:
- .1 Triple glazed units 37.4mm thickness coming with :
- .2 Low conductance warm edge spacer
- .3 Outboard glass; Heat Strengthened, LoE² 272 on face #2 on 6mm Clear glass
- .4 Gap; Argon gas, 12.7mm thickness
- .5 Middle glass; LoE² 272 on face #4 on 6mm Clear glass
- .6 Gap; Argon gas, 12.7mm thickness
- .7 Inboard glass; Tempered , 6mm Clear glass
- .8 Light transmittance: 54.8%
- .9 Shading coefficient: 0.31

.10 Argon Gas filled sealed units:
.11 Winter u/v (Argon): 1.4
.12 Summer u/v (Argon): 1.2
.13 Reflectance: 13% out and in
.14 Solar: 29%
.15 Standard of Acceptance based on Cardinal LoE2 272 on clear.
.16 Acceptable Alternate Product: PPG, Solarban 60

.3 (GL3) Exterior Triple Sealed Glass in FSS Room, tinting to match existing.

2.2 INTERIOR GLAZING

.1 Interior Glazed Doors and Borrowed Lights:
.1 Single pane glass at windows and doors as indicated.
.2 Thickness: 6 mm
.3 Tempered: treated safety glass to CAN/CGSB-12.1
.4 Colour: clear

.2 Rated Wire Glass: to CAN/CGSB 12.11
.1 45 Min rated Georgian polished wire glass.
.2 Thickness: 6 mm
.3 Colour: clear

.3 Glazing in Structural Sealed:
.1 Clear glass
.2 Thickness: 10 mm
.3 Tempered safety glass to CAN/CGSB 12.1

4 Mirror:
.1 Thickness: 6 mm
.2 No. 1 quality silvered glass.
.3 All edges ground smooth and beveled.
.4 Tempered
.5 Mount to wall with stainless steel edge clips.
.6 Refer to drawings for size.

2.3 ACCESSORIES

.1 Sealants: Silicone glazing sealants. Refer to Joint Sealants Section 07 92 00.

.2 Setting Blocks: Neoprene, EPDM or Silicone, 80 to 90 Shore A durometer hardness.

.3 Spacer Shims: Neoprene, Silicone, 50 to 60 - Shore A durometer hardness.

.4 Glazing Tape: Preformed butyl compound with integral resilient tube spacing device.

.5 Warm edge spacer: Colour to be determined by Consultant from full colour range, low conductance warm edge spacer.

.6 Glazing splines: neoprene polyvinyl chloride manufacturer's standard dry glazing splines to suit aluminum extrusions.

.7 Primer-sealers and cleaners: to glass manufactures standard.

.8 Lock-strip Gaskets: grey neoprene to ASTM C542, H-type U type for cavities spline type for recessed reglets type: provide internal drainage channel with drainage holes in sill section. Injection mould one-piece corner sections and heat seal to main gasket.

.9 Breather Tubes: to manufacturer's standard.

.10 Mirror Attachment Accessories:
- .1 Stainless steel clips
- .2 Mirror adhesive: chemically compatible with mirror coating and wall substrate

.11 Frosted Film:
- .1 3 mm fasara glass finishes, translucent vinyl.
- .2 Selected from Manufacturer's recommendation.

PART 3 - EXECUTION

3.1 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 that may impede moisture movement; weeps are clear, and ready to receive panels.

3.2 PREPARATION OF SUBSTRATE

.1 Clean contact surfaces with solvent and wipe dry.

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

.3 Prime surfaces scheduled to receive sealant.

.4 Ensure wall surface is smooth and level at large wall mounted mirrors

3.3 INTERFACE WITH OTHER SYSTEMS

.1 Refer to Joint Sealants, Section 07 92 00.

.2 Refer to Curtain Wall and Glazed Assemblies, Section 08 44 00.

3.4 GLAZING INSTALLATION

.1 Install glazing as per manufacturer's recommendations and to suit framing systems used.

.2 Aluminum Glazing Installation at Exterior Frame: Wet/Dry Method (Preformed Tape and Sealant):

- .1 Cut glazing tape to length and set against permanent stops, 6 mm below sight line. Seal corners by butting tape and dabbing with sealant.
- .2 Apply heel bead of sealant along intersection of permanent stop with frame ensuring full perimeter seal between glass and frame to complete continuity of air and vapour seal.
- .3 Place setting blocks at ¼ points, with edge block maximum 150 mm from corners.
- .4 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.
- .5 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 flush with sight line.
- .6 Fill gap between glazing and stop with sealant to depth equal to bite of frame on glazing.

.3 Glazing Installation for Interior Frames: Dry (Tape and Tape) Method:

- .1 Cut glazing tape to length and set against permanent stops, projecting 1.5 mm above sight line.
- .2 Place setting blocks at 1/4 points, with edge block maximum 150 mm from corners.
- .3 Rest glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
- .4 Place glazing tape on free perimeter of glazing.
- .5 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact.
- .6 Knife trim protruding tape.

.4 Structural Sealed Glazing Interior:

- .1 Refer to Section 07 90 00 Joint Sealants for description of structural sealant interior glazing.

3.5 PROTECTION AFTER WORK COMPLETED

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

3.6 ADJUSTMENT

.1 Immediately remove sealant and compound labels after work is completed. Remove droppings from finished surfaces.

3.7 CLEANING

.1 Refer to Division 01, Cleaning, for cleaning of installed work.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels after Work is complete.

.4 Clean panels and adjacent surfaces.

END