## Part 1 General

### 1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM)

- .1 ASTM A653/A653M-[06a], Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM B29-[03], Standard Specification for Refined Lead.
- .3 ASTM B749-[03], Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.

.2 Canadian General Standards Board (CGSB)

- .1 CAN/CGSB-1.181-[99], Ready-Mixed Organic Zinc-Rich Coating.
- .2 CGSB 41-GP-19Ma-[84], Rigid Vinyl Extrusions for Windows and Doors.

.3 Canadian Standards Association (CSA International)

- .1 CSA-G40.20-[04]/G40.21-[04], General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
- .2 CSA W59-[03], Welded Steel Construction (Metal Arc Welding).

.4 Canadian Steel Door Manufacturers' Association (CSDMA)

- .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frames, [2000].
- .2 CSDMA, Selection and Usage Guide for Commercial Steel Doors, [1990].

.5 National Fire Protection Association (NFPA)

- .1 NFPA 80-[99], Standard for Fire Doors and Fire Windows.
- .2 NFPA 252-[03], Standard Methods of Fire Tests of Door Assemblies.

.6 South Coast Air Quality Management District (SCAQMD), California State

- .1 SCAQMD Rule 1113-[04], Architectural Coatings.
- .2 SCAQMD Rule 1168-[05], Adhesives and Sealants Applications.

.7 Steel Door Institute (SDI)

- .1 ANSI/SDI A250.8, Recommended Specifications for Standard Steel Doors and Frames.

.8 Underwriters' Laboratories of Canada (ULC)

- .1 CAN/ULC-S701-[01], Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
- .2 CAN/ULC-S702-[97], Standard for Thermal Insulation, Mineral Fibre, for Buildings.
- .3 CAN/ULC-S704-[03], Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .4 CAN4-S104-[M80], Standard Method for Fire Tests of Door Assemblies.
- .5 CAN4-S105-[M85], Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

**1.2 SYSTEM DESCRIPTION**

.1 Design door assembly to withstand minimum 1,000,000 swing cycles in accordance with ANSI A151.1, with no failure of any design features of the door.

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

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

.4 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104 and NFPA 252 for ratings specified or indicated.

.5 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104 and NFPA 252 and listed by nationally recognized agency having factory inspection services and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

**1.3 SUBMITTALS**

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

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

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

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

**1.4 QUALITY ASSURANCE**

.1 Conform to requirements of CSDFMA SDI-100 and ANSI A117.1.

.2 Company specializing in manufacturing products specified with a minimum of five (5) years documented experience.

**1.5 PROJECT CONDITIONS**

.1 Coordinate the work with frame opening construction, door, and hardware installation.

.2 Sequence installation to ensure wire connections are achieved in an orderly and expeditious manner.

**1.6 DELIVERY, STORAGE AND HANDLING**

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

.2 Deliver, handle and store doors and frames at the job site in such a manner as to prevent damage.

.3 Store doors and frames under cover with doors stored in a vertical position on blocking, clear of floor and with blocking between doors to permit air circulation.

**1.7 WARRANTY**

.1 Provide a written warranty for work of this section from manufacturer for failure due to defective materials and from Contractor for failure due to defective installation workmanship, for one (1) year respectively.

**Part 2 Products**

**2.1 MATERIALS**

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

.2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

.3 Cast or rolled pure sheet lead: to ASTM B29.

.4 Composites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

**2.2 DOOR CORE MATERIALS**

.1 Stiffened: face sheets welded insulated core.

.1 Expanded polystyrene: CAN/ULC-S701, density 16 to 32 kg/m³.

.2 Polyurethane: to CAN/ULC-S704 rigid, modified polyisocyanurate, closed cell board. Density 32 kg/m³.

.2 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250˚C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

.3 Thermal Insulation material must:

.1 Not require being labelled as poisonous, corrosive, flammable or explosive under the Consumer Chemical and Container Regulations of the Hazardous Products Act.

.2 Be manufactured using a process that uses chemical compounds with the minimum zone depletion potential (ODP) available.

**2.3 ADHESIVES**

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

.1 Adhesive: maximum VOC content to SCAQMD Rule 1168.

.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 PRIMER**

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

.1 Maximum VOC limit to SCAQMD Rule 1168.

**2.5 PAINT**

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

.1 Maximum VOC emission level to SCAQMD Rule 1168.

**2.6 ACCESSORIES**

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

.2 Exterior top and bottom caps steel.

.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 Door bottom seal: Section 08 71 00 – Door Hardware.

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

.6 Fire labels: metal riveted.

.7 Sealant: Section 07 92 00 – Joint Sealing.

.8 Provide low expanding, single component polyurethane foam sealant installed at head and jamb perimeter of door frame for sealing to building air barrier, vapour retarder and door 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.

.9 Glazing: Section 08 80 00 – Glazing.

.10 Make provisions for glazing as indicated and provide necessary glazing stops.

.1 Provide removable stainless steel glazing beads for dry glazing of snap-on type.

.2 Design exterior glazing stops to be tamperproof.

.11 Finish Painting: to Section 09 91 13 – Exterior Painting and Section 09 91 23 – Interior Painting.

**2.7 FRAMES FABRICATION GENERAL**

.1 Fabricate frames in accordance with CSDMA specifications.

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

.3 Exterior Frames:

.1 Minimum 14 gauge pressed metal, thermally broken, welded construction.

.4 Interior Frames:

.1 Minimum 14 gauge pressed metal, welded 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, 3 for single door, 2 at head for double door.

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

.9 Conceal fastenings except where exposed fastenings are indicated.

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

.11 Insulate exterior frame components with polyurethane insulation. Fabricate frames as welded unit. Welding in accordance with CSA W59.

.12 Mullions for Double Doors: Fixed type, of same profiles as jambs.

.13 Transom Bars for Glazed Lights: Fixed type, of same profiles as jamb and head.

.14 Reinforce frames wider than 1200 mm inches with roll formed steel channels fitted tightly into frame head, flush with top.

.15 Prepare frames for silencers. Provide three single silencers for single doors and mullions of double doors on strike side. Provide two single silencers on frame head at double doors without mullions.

.16 Attach fire rated label to each fire rated door unit.

.17 Attach channel spreaders at bottom of frames for shipping.

**2.8 FRAME ANCHORAGE**

.1 Shim and anchor new doors in accordance with CAN/CSA A440.4.

.2 Provide appropriate anchorage to floor and wall construction.

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

.4 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.

.5 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.

**2.9 FRAMES: WELDED TYPE**

.1 Welding in accordance with CSA W59.

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

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

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

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

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

**2.10 DOOR FABRICATION GENERAL**

.1 All metal doors to be minimum 16 gauge with welded seams.

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

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

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

.5 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E330.

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

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

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

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

.10 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104 ASTM E152 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.

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

**2.11 DOORS TYPES**

.1 Refer to Door and Door Frame Schedule in drawings for further information.

**2.12 HOLLOW STEEL CONSTRUCTION**

.1 Form each face sheet for exterior doors from 16 gauge sheet steel.

.2 Form each face sheet for interior doors from 16 gauge 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 polystyrene core.

.5 Fill voids between stiffeners of interior doors with honeycomb core.

**2.13 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 polyvinyl chloride extrusion conforming to CGSB 41-GP-19Ma.

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

.4 Apply insulation.

**2.14 DOOR SECURITY**

.1 Door security hardware to be flush mounted on all frames.

.2 Refer to Electrical drawings for door rough-in provisions. Security devices to be provided and installed by others unless noted otherwise.

**Part 3 Execution**

**3.1 MANUFACTURER'S INSTRUCTIONS**

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

**3.2 INSTALLATION GENERAL**

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

.2 Install doors and frames to CSDMA Installation Guide

**3.3 FRAME INSTALLATION**

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

.2 Secure anchorages and connections to adjacent construction.

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

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

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

.6 Maintain continuity of air barrier and vapour retarder.

.7 Coordinate installation of door security hardware in accordance with to Section 27 05 28 – Pathways for Communications Systems and manufacturer's instructions.

**3.4 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 as follows.

.1 Hinge side: 1.0 mm.
.2 Latch side and head: 1.5 mm.
.3 Finished floor: 13 mm.

.3 Adjust door for smooth and balanced door movement.

.4 Install louvres.

.5 Coordinate installation of door security hardware in accordance with Section 28 13 01 – Electronic Security and Intrusion System Rough In and manufacturer's instructions.

**3.5 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.

**3.6 GLAZING**

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

**3.3 ERECTION TOLERANCES**

.1 Maximum Diagonal Distortion: 1.5 nun inch measured with straight edges, crossed corner to corner.

.2 Clearance on steel doors at head and jambs shall be 3mm maximum, and 3mm maximum between pairs of doors.

**3.7 CLEANING**

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

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

.1 Architectural Woodwork Manufacturers Association of Canada (AWMAC) and Architectural Woodwork Institute (AWI)

.1 Architectural Woodwork Quality Standards Manual, 2nd edition (AWS).

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-71.19-[M88], Adhesive, Contact, Sprayable.

.2 CAN/CGSB-71.20-[M88], Adhesive, Contact, Brushable.

.3 Canadian Standards Association (CSA International).

.1 CSA A440.2-[98], Energy Performance of Windows and Other Fenestration Systems.

.2 CSA O115-[M1982(R2001)], Hardwood and Decorative Plywood.

.3 CAN/CSA O132.2 Series-[90(R1998)], Wood Flush Doors.

.4 CAN/CSA-O132.5-[M1992(R1998)], Stile and Rail Wood Doors.

.5 CAN/CSA-Z808-[96], A Sustainable Forest Management System: Guidance Document.

.6 CSA Certification Program for Windows and Doors [00].

.4 Environmental Choice Program (ECP).

.1 CCD-045-[92], Sealants and Caulking Compounds.

.2 CCD-046-[92], Adhesives.

.5 National Fire Protection Association (NFPA).

.1 NFPA 80-[1999], Standard for Fire Doors and Fire Windows.

.2 NFPA 252-[1999], Standard Method of Fire Tests of Door Assemblies.

.6 Underwriters' Laboratories of Canada (ULC).

.1 CAN-4S104M-[80(R1985)], Fire Tests of Door Assemblies.

.2 CAN4-S105M-[85 (R1992)], Fire Door Frames Meeting the Performance Required by CAN4-S104.

.7 Window and Door Manufacturer’s Association.

.1 ANSI/WDMA I.S.1A, Latest Edition

.2 ANSI/WDMA I.S.6A, Latest Edition

### 1.2 SUBMITTALS

.1 Product Data:

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

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

.1 For caulking materials during application and curing.

.2 For door materials and adhesives.

.2 Shop Drawings:

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

.2 Indicate door types and cutouts for lights, sizes, core construction.

**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.

.3 Show door construction, core, glazing detail and faces.

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

**1.4 REGULATORY REQUIREMENTS**

.1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.

**1.5 QUALITY ASSURANCE**

.1 Regulatory Requirements:

.1 Wood fire rated doors: labelled and listed by an organization accredited by Standards Council of Canada.

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

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

.4 Work in accordance with Grade or Grades specified of the *AWS*.

**1.6 DELIVERY, STORAGE, AND HANDLING**

.1 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.

.4 Store doors away from direct sunlight.

**1.7 WARRANTY**

.1 Provide a written guarantee, signed and issued in the name of The Owner, covering the wood doors for both material and workmanship for a period of 10 (ten) years from the date of Substantial Completion.

.2 Areas which prove to be defective in any way shall be repaired or replaced and any damage to other work as a result of such defects shall be repaired at no cost to The Owner.

## Part 2 Products

### 2.1 INTERIOR FLUSH WOOD DOORS

.1 Doors to meet requirements of ANSI/WDMA Heavy Duty performance values.

.2 Faces of wood veneered doors intended for transparent finish to be rotary cut with book veneer match. Species as noted.

.3 Grain direction to be vertical.

.4 Faces at doors for opaque finish to be closed grain hardwood.

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

.1 Construction:

.1 Solid particleboard core: stile and rail frame bonded to particleboard core with wood lock blocks 7-ply construction.

.2 Solid wood core:

.1 Glued block core with wood edge band.

.2 Framed block glued core.

.3 Framed block nonglued core.

.4 Stile and rail core.

.5 7-ply construction.

.6 Adhesive: Type II (Water resistant) for interior doors.

.2 Hollow core: to CAN/CSA-0132.2.2.

.1 Construction:

.2 Ladder core with lock blocks, 7-ply construction

.3 Adhesive: Type II (Water resistant) for interior doors.

.3 Fire Rated Wood Doors: tested in accordance with CAN4-S104/NFPA 252 to achieve rating as scheduled exceeding 45 minutes shall have an incombustible mineral core (asbestos free).

.1 Provide UL label in accordance with fire rating noted in door schedule.

### 2.2 DOORS TYPES

.1 Refer to Door and Door Frame Schedule in drawings for further information.

### 2.3 GLAZING

.1 Glass: in accordance with Section 08 80 00 - Glazing.

.2 All glass in doors to be tempered unless otherwise noted.

### 2.4 FABRICATION

.1 Vertical edge strips to match face veneer.

.2 Prepare doors for glazing. Provide hardwood species to match face veneer, 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.

**2.5 DOOR SECURITY**

.1 Door security hardware to be flush mounted on all frames.

.2 Refer to Electrical drawings for door rough-in provisions. Security devices to be provided and installed by others unless noted otherwise.

**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**

.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.

.6 Install louvres and stops.

.7 Secure transom and side panels by means of concealed fasteners or countersunk screws concealed by means of wood plugs matching panel in grain and colour.

.8 Door security hardware to be flush mounted on all frames

**3.3 ADJUSTMENT**

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

**3.4 CLEANING**

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

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

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

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

.5 On completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

**3.5 COMMISSIONING**

.1 Contractor to instruct maintenance personnel in operation and maintenance of doors and hardware.

.2 Confirm operation and function for all doors and hardware.

.3 Commissioning will be witnessed by Contract Administrator and certificate will be signed by Contractor and Contract Administrator.

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

.1 American Architectural Manufacturers Association (AAMA).

.1 AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.

.2 American National Standards Institute (ANSI).

.1 ANSI Z97.1 Standards for Safety Glazing Material Used in Buildings.

.3 American Society for Testing and Materials International, (ASTM).

.1 ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.

.2 ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.

.3 ASTM 283e Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.4 National Association of Architectural Metal Manufacturers (NAAMM).

.1 Metal Finishes Manual for Architectural Metal Products.

### 1.2 SUBMITTALS

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

.2 Product Data: Submit Manufacturer’s product data for all glass entrance systems including:

.1 Manufacturer’s standard details and fabrication method.

.2 Data on finishing, hardware and accessories.

.3 Recommendations for maintenance and cleaning of exterior finish surfaces.

.4 Test data on fabricated door.

.3 Shop drawings for each all glass entrance system are required, including:

.1 Layout and installation details.

.2 Elevations at 1/4-inch scale.

.3 Detail sections of fittings.

.4 Hardware mounting heights.

.5 Anchorage and reinforcement.

.6 Glazing details.

.4 Samples for approval:

.1 Submit pairs of samples of each specified metal color and finish on 9-inch long sections of extrusions or formed shapes.

.2 Submit samples of glass approximately 6 inches square showing the edge conditions.

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

**1.3 QUALITY ASSURANCE**

.1 Installer qualifications: Engage an experienced installer who has completed installations of all glass entrances similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in service performance.

.2 Manufacturer's qualifications: Provide all glass entrances produced by a firm experienced in manufacturing entrance systems that are similar to those indicated for this project and that have a record of successful in service performance. All door rail systems must be tested.

.3 Single source responsibility: Obtain all glass entrance systems from a single manufacturer, to ensure full compatibility and warranty of parts.

.4 Design criteria: The drawings indicate the size, profile and dimensional requirements of the all glass entrance system required and are based on the specific types and models indicated. All glass entrances by other manufacturers may be considered, provided deviations in dimensions and profiles are minor and do not change the design concept as judged by the Contract Administrator. The burden of proof of equality is on the proposer.

.5 Safety glass standard: Provide tempered glass components that comply with ANSI Z97.1 and testing requirements of CPSC 16 CFR 1201 Category II.

.6 Testing criteria for Door Rail: The door rail must be tested to perform 1,000,000 cycles without any failures. The door rail should also be subject to a temperature pull-off test at temperatures from -10ºF to 150ºF (-23ºC to 65.5ºC). The rail shall remain stationary throughout this test while a 500 pound (227 kg) pressure is applied.

**1.4 DELIVERY STORAGE AND HANDLING**

.1 Deliver all glass entrances and related components in the manufacturer's original protective packaging. Do not deliver entrance units until the work is ready for their installation.

.2 Inspect components for damage upon delivery. Unless minor defects in metal components can be made to meet the Contract Administrator's specifications and satisfaction, damaged parts should be removed and replaced.

**1.5 PROJECT CONDITIONS**

.1 Field Measurements: Check opening by accurate field measurement before fabrication. Show recorder measurements on shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of the work and possible damage to the finished product.

.1 Where necessary, proceed with fabrication without measurement and coordination fabrication tolerances to insure proper fit.

**1.6 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

## Part 2 Products

### 2.1 MANUFACTURER

.1 Basis of design: Design is based on an “All-Glass” Entrance Door System featuring heavy tempered glass manufactured by:

C.R. Laurence Co., Inc. (CRL)
Tel: (800) 421-6144 Fax: (800) 587-7501
Email: architectural@crlaurence.com
www.crlaurence.com

### 2.2 MATERIALS

.1 Glass: Provide flat, fully tempered glass in thickness indicated for doors and sidelites. Comply with requirements of ASTM C 1048 for FT (fully tempered), Condition A (uncoated surfaces), Type 1 (transparent) Class 1 (clear) glass. Provide products of thickness indicated that have been tested for surface and edge compression according to ASTM C 1048 and for impact strength according to 16 CFR Part 1201 for Category II materials.

.1 Thickness: 1/2 inch (12 mm)

.2 Fittings, General: Rails in required profile, size and glass thickness as selected by the Contract Administrator. Comply with requirements indicated for kind and form of metal finish.

.1 Aluminum: Provide fittings fabricated from aluminum extrusions of alloy and temper recommended by manufacturer for use intended and required for application of finish indicated, but not less than strength and durability properties specified in ASTM B 221 for 6063-T5.

.2 Profile: Square

.3 Height: 4 inch (102 mm)

.3 Anchors and Fasteners: Manufacturer’s standard concealed anchors and fastenings. Do not use exposed fasteners.

.4 Sealants and Gaskets:

.1 Provide manufacturer’s standard gasketing and setting blocks.

.2 Provide extruded silicone gaskets or silicone sealant at connections between glass panels and adjacent assemblies.

.1 Colour: Clear

.5 Finishing Accessories:

.1 Provide rail end caps at exposed ends of installation to match rail finish.

### 2.3 HARDWARE

.1 General: Provide heavy-duty hardware units as indicated, scheduled or required for operation of each type of door, including the following items of sizes, numbers and type recommended by the manufacturer for the type of service required. Provide metal and finish for exposed parts to match the finish of the door rails.

**2.4 FABRICATION**

.1 General: Fabricate all glass entrance components to designs and sizes indicated. Size of door and profile requirements of fittings and hardware are indicated on the drawings.

.1 Locate and provide holes and cutouts in glass to receive hardware before tempering glass. Do not permit cutting, drilling or other alterations to glass after tempering.

.2 Fabricate work to accommodate required fittings, hardware, anchors, reinforcement, and accessory items.

.2 Prefabrication: Complete fabrication, assembly, finishing, hardware application and other work to the greatest extent possible before shipment to the project site. Disassemble components only as necessary for shipment and installation.

.3 Continuity: Maintain accurate relation of planes and angles with hairline fit of contracting members.

**2.5 ALUMINUM FINISHES**

.1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

.2 Anodized Finish:

.1 US-28 Clear Satin Anodized Aluminum

**Part 3 Execution**

**3.1 EXAMINATION**

.1 Examine substrates and supports with the installer, present for compliance with requirements indicated, installation tolerances and other conditions that affect the installation of all glass entrances and storefronts. Correct unsatisfactory conditions before proceeding with the installation.

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

**3.2 INSTALLATION**

.1 Install all glass entrance door and associated components in accordance with manufacturer’s printed instructions and recommendations.

.1 Verify units level, plumb and true line.

.2 Lubricate hardware and other moving parts.

**3.3 ADJUSTING**

.1 Adjust doors and hardware to provide a tight fit at meeting points and at weather-stripping for smooth operation and weather tight closure.

.2 Hardware: Adjust operating hardware to ensure proper operation. Set, seal, and grout floor closer cases. Coordinate cylinder installation.

**3.4 CLEANING AND PROTECTION**

.1 Clean adjacent surfaces soiled by door installation.

.2 Clean glass and metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages finish to match original finish.

.1 Comply with requirements in Division 08 Section Glazing for cleaning and maintaining glass.

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

.1 American Architectural Manufacturers Association (AAMA).

.1 AAMA 611 Voluntary Specification for Anodized Architectural Aluminum.

.2 American National Standards Institute (ANSI).

.1 ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

.2 ANSI Z97.1 Standards for Safety Glazing Material Used in Buildings.

.3 American Society for Testing and Materials International, (ASTM).

.1 ASTM B221 Standard Specification for Aluminum and Aluminum Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.

.2 ASTM B209 Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.

.3 ASTM 283e Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

.4 Canadian Standards Association (CSA International).

.1 CAN/CSA-C22.2 No. 247 – Operators and Systems of Doors, Gates, Draperies, and Louvers.

.5 National Association of Architectural Metal Manufacturers (NAAMM).

.1 Metal Finishes Manual for Architectural Metal Products.

.6 Underwriters Laboratories (UL).

.1 UL 325 Standard for Safety for Door, Drapery, Gate, Louver and window Operators and Systems.

### 1.2 DEFINITIONS

.1 Activation Device: Device that, when actuated, sends an electrical signal to the door operator to activate the operation of the door.

.1 Knowing act: Consciously initiating the opening of a power operated door using acceptable methods including wall mounted switches such as push plates and controlled access devices such as keypads, card readers and key switches.

.2 Safety Device: A device that detects the presence of an object or person within a zone where contact could occur and provides a signal to stop the movement of the door.

.3 AAADM: American Association of Automatic Door Manufacturers.

### 1.3 PERFORMANCE REQUIREMENTS

.1 General: Provide doors that have been designed and fabricated to comply with specified performance requirements, as demonstrated by testing manufacturer's corresponding standard systems.

.2 Compliance:

.1 ANSI/BHMA A156.10 American National Standard for Power Operated Pedestrian Doors.

.2 UL 325 listed.

.3 Automatic door equipment accommodates medium to heavy pedestrian traffic.

.4 Automatic Door equipment accommodates up to the following weights for active leaf doors:

.1 Bi-part doors: 300 lbs (136 kg) per active breakout leaf.

.2 Single doors: 300 lbs (136 kg) per active breakout leaf.

.5 Operating Temperature Range: -31° F to 122° F (-35° C to 50° C).

.6 Entrapment Force Requirements:

.1 Power Operated Sliding Doors: Not more than 30 lbf (133 N) required to prevent stopped door from closing.

.2 Sliding doors provided with a breakaway device shall require no more than 50 lbf (222N) applied 1 inch (25 mm) from the leading edge of the lock stile for the breakout panel to open.

## 1.4 SUBMITTALS

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

.2 Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, fabrication, operational descriptions and finishes.

.3 Shop Drawings: Submit manufacturer’s shop drawings, including elevations, sections and details, indicating dimensions, materials, and fabrication of doors, frames, sidelites, operator, motion /presence sensor control device, anchors, hardware, finish, options and accessories.

.4 Samples: Submit manufacturer’s samples of aluminum finish.

.5 Manufacturers Field Reports: Submit manufacturer’s field reports from AAADM certified technician of inspection and approval of doors for compliance with ANSI/BHMA A156.10 after completion of installation.

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

## 1.5 QUALITY ASSURANCE

.1 Manufacturers Qualifications: Engage qualified manufacturers with a minimum 10 years of documented experience in manufacturing of doors and equipment of similar to that indicated for this Project and that have a proven record of successful in-service performance.

.1 A manufacturer with company certificate issued by AAADM.

.2 Installer Qualifications: Installers, trained by the primary product manufacturers, with a minimum 3 years documented experience installing and maintenance of units similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

.3 Certified Inspector Qualifications: Certified by AAADM.

.4 Source Limitations for Automatic Entrances: Obtain each type of door, frame, operator and sensor components specified in this Section from a single source, same manufacturer unless otherwise indicated.

.5 Power-Operated Pedestrian Door Standard: ANSI/BHMA A156.10 (current version).

.6 Emergency Exit door requirements: Comply with requirements of authorities having jurisdiction for automatic entrance doors serving as a required means of egress.

**1.6 PROJECT CONDITIONS**

.1 Field Measurements: Verify actual dimensions of openings to receive automatic entrances by field measurements before fabrication and indicate on shop drawings.

.2 Coordinate sizes and locations of recesses in concrete floors for recessed tracks and thresholds if applicable. Concrete, reinforcement and formwork are specified in Division 03.

.3 Electrical System Roughing-in: Coordinate layout and installation of automatic entrances with connections to power supplies and access control system as applicable.

**1.7 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

**1.8 WARRANTY**

.1 During the warranty period a factory-trained technician shall perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.

.2 During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal business hours.

.3 Manufacturer shall have in place a dispatch procedure that shall be available 24 hours a Day, 7 Days a week for emergency call back service

**Part 2 Products**

**2.1 MANUFACTURER**

.1 Manufacturer: ASSA ABLOY Entrance Systems, 1900 Airport Road, Monroe, NC 28110. Toll Free (877) SPEC-123. Phone (704) 290-5520 Fax (704) 290- 5555 Website www.assaabloyentrance.com contact: specdesk.na.aaes@assaabloy.com

**2.2 SLIDING AUTOMATIC ENTRANCES**

.1 Model: Besam SL500 EcoDoor sliding automatic doors. (Basis of Design):

.1 Aluminum doors and frames with sidelites and active door leaves.

.2 Overhead concealed, electro-mechanical, microprocessor controlled, sliding door operator.

.3 Operator housing, guide system and door carriers.

.2 Sliding Automatic Entrance Doors Configuration:

.1 Single slide, full breakout, door system.

.1 Configuration: Single slide, two equal panel door unit with one operable leaf and one sidelite unit.

.2 Traffic Pattern: Two-way.

.3 Emergency Breakaway Capability: Interior sliding leaf and sidelite unit.

.4 Mounting: Overhead header installed between jambs.

## 2.3 ALUMINUM DOORS AND FRAMES

.1 Doors and Frames: Extruded Aluminum, Alloy 6063-T5.

.1 Door panels shall have a minimum .125 inch (3.2 mm) structural wall thickness including adjoining horizontal members and perimeter frames where applicable.

.2 Door Construction shall be by means of an integrated corner block with 3/8 inch all-thread through bolt from each stile.

.3 Glass stops shall be .062 inch (15.8 mm) wall thickness and shall provide security function as a standard by means of a fixed non-removable exterior section with glazing to be performed from the interior only. Glazing stops that allow for glass removal from the exterior shall not be deemed as equivalent.

.4 The sliding door system shall include two interlocks securing the leading stile of the sidelite and the butt stile of the sliding door panel together.

.5 Vertical Stiles shall be medium stile 4 inch (102 mm).

.6 Bottom Rails shall be standard 4 inch (102 mm).

.7 Weather-stripping shall be slide-in type, replaceable pile mohair seals retained by the aluminum extrusions. The following types of weather-stripping are required: complementing weather-stripping on the joining vertical stiles of the sidelite and sliding door panels, complementing weather-stripping on the lead edge of the lock stiles of bi-parting doors, single pile weather-stripping between the carrier and the header, single pile weather-stripping on the lead edge stile of single slide door panels, dual pile weather-stripping on the pivot stile of breakout sidelite panels, and dual pile weather-stripping on the butt stile of fixed sidelite panels. Bottom rails shall be provided with an adjustable nylon sweep.

.2 Besam EcoDoor Package:

.1 EcoDoor Seals: High pile mohair weather stripping on the lock stile of the sliding doors, integrated mohair weather stripping with vinyl fin on the joining vertical stiles of the sidelite and sliding door panels, and expandable foam inserts in leading stile of sidelite panels at pockets for interlocks. Bottom rails shall be provided with a concealed adjustable nylon sweep.

.2 Glazing Active Door and Sidelite Panels: Insulating glass, thickness as indicated.

.3 Hydraulic closer(s) to return breakout door and sidelite panels to the closed position, and magnetic catch(s) to retain breakout door and sidelite panels in the closed position.

.2 Glass: Glazing shall comply with ANSI Z97.1, thickness as indicated.

.1 Glazing Active Door Panels: 1” insulated (25 mm)

.2 Glazing Sidelite Panels: 1" insulated (25 mm)

.3 Glazing Transom Panel: 1" insulated (25 mm)

.4 Glazing Installation: See Division 8 Section Glazing for requirements.

.3 Door Carriers: Manufacturer's standard carrier assembly that allows vertical adjustment.

.1 Carriage Assembly: Carriage bar with two wheel assemblies. Each assembly shall have tandem roller wheels.

.2 Roller Wheels: Two heavy duty Delrin roller wheels per wheel assembly, for a total of four (4) roller wheels, 1-7/16 inch (36.51 mm) diameter, per active door leaf for operation over a replaceable aluminum track. Single journal with sealed oil impregnated bearings.

.3 Two (2) heavy duty self-aligning anti-risers per leaf.

.4 Framing Members: Provide automatic entrances as complete assemblies. Manufacturer's standard extruded aluminum framing reinforced as required to support loads.

.1 Vertical jambs shall be 1-3/4 inches (44.5 mm) by 4-1/2 inches (114.3 mm).

.5 Header: Manufacturer's standard one-piece extruded aluminum header with a replaceable aluminum track extending full width of entrance unit. Header to conceal door operators, carrier assemblies, and roller track; complete with hinged access panel for service of door operator, and controls.

.1 Span: Maximum 16'-0" (4.9 m) without intermediate supports when using 1/4-inch glass.

.2 Capacity: Capable of supporting active breakout leafs up to maximum of 300 lb (136 kg) per leaf when header is supported per manufacturer's recommendations.

.3 Size: 4-1/2 inches (114.3 mm) wide by 7 inches (177.8 mm) high.

.4 Header height including the sensor plate cap which spans the clear door opening width is 8-1/2 inches (215.9 mm) high.

.5 Hinge Point: Continuous hinge at top of header allows for complete access to operator and internal electronic and mechanical assemblies.

.6 Design: Manufacturer's standard closed header.

.6 Hardware: Provide manufacturer's standard hardware as required for operation indicated.

.1 Breakaway arms and bottom pivot assemblies shall be supplied by the manufacturer and shall be adjustable to comply with applicable codes.

.2 Locking hardware shall be provided as indicated.

.7 Guide Track/Threshold: Manufacturer's threshold as indicated.

.1 1/2 inch (12.7 mm) high by 4-1/2 inch (114.3 mm) width continuous aluminum threshold with integral track shall span the entire width of the sliding door header and fit between the vertical framing members. Threshold design shall allow for optional extruded ramps to securely interlock to flat section to meet ADA requirements.

.1 Surface mounted threshold with interlocking ADA accessible ramps.

**2.4 SLIDING DOOR OPERATOR**

.1 Door Operator and Controller:

.1 Electro-mechanical controlled unit utilizing a high-efficiency, energy efficient, DC motor requiring a maximum of 3 amp current draw, allowing 5 operators on one 20 amp circuit. The supplied system shall have the capability to operate at full performance well beyond a brown out and high line voltage conditions (85V – 265V) sensing changes and adjusting automatically. The operator shall allow an adjustable hold open time delay of 0 to 60 seconds and have internal software to incorporate a self-diagnostic system.

.2 Microprocessor Control Box:

.1 Modular control unit to allow for changing technology. Factory-adjusted configuration with opening and closing speeds set to comply with ANSI/BHMA A156.10 requirements and electronic dampening to reduce wear on drive train. Should the drive train operations deviate from design criteria ranges, Watchdog Control Circuit Monitoring will assume command of the system and shut down the automatic function allowing a secondary supervisory circuit to perform as a backup. Control unit shall allow the following functions:

.1 Diagnostics with the ability to produce application data.

.3 Mode Selector Control:

.1 Multi-position rotary knob mode selector switch to be interior jamb mounted and shall allow selection of the indicated functions to be engaged when switch is turned to the appropriate setting.

.2 Mode selector control to allow the following functions:

.1 “Off”

.2 “Exit Only” one way traffic with automatic operation from the interior.

.3 “Two Way Traffic” allowing automatic operation from exterior and interior.

.4 “Partial Opening” energy saving door position allows door to automatically adjust opening width based on amount of usage, that is, full open during high use and partial open during low use. The control for this setting is programmable allowing adjustment to both the usage setting and the opening width.

.5 “Hold Open” doors activated and held in the full open position.

## 2.5 ACTIVATION AND SAFETY CONTROL DEVICES

.1 General: Provide the types of activation and safety devices specified in accordance with ANSI/BHMA standards, for the condition of exposure and for long-term, maintenance-free operation under normal traffic load for type of occupancy indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.

.2 Combination Activation Motion Sensor/Safety Presence Sensor:

.1 Shall be a sliding door sensor utilizing K-band microwave technology to detect motion and focused active infrared technology to detect presence, combined in a single housing surface mounted on each side of the header.

.1 Presence sensor shall remain active at all times.

.2 The sensor shall communicate with the automatic door operator through a self-monitoring connection that allows the door to go into a fail safe mode preventing the door from closing in the event of a sensor failure.

.3 Motion/presence detecting sensors to be field installed and adjusted.

**2.6 DOOR SECURITY**

.1 Door security hardware to be flush mounted on all frames

.2 Refer to Electrical drawings for door rough-in provisions. Security devices to be provided and installed by others unless noted otherwise.

**2.7 ELECTRICAL**

.1 High-Efficiency DC Motor: Maximum of 3 amp current draw, allowing 5 operators to run on one 20 Amp circuit.

.2 Power: Self-detecting line voltage capable control. 120 VAC through 240 VAC, 50/60 Hz, 3 amp minimum incoming power with solid earth ground connection for each door system.

.3 Key Impulse Input: Input for card readers or remote activation with independent adjustable hold open delay.

.4 Wiring: Separate internal channel raceway free from moving parts.

.5 Brown out / high voltage capability: System has capability to operate at full performance well beyond brown out and high voltage line conditions (85 V – 265 V) sensing changes and adjusting automatically.

**2.8 ALUMINUM FINISHES**

.1 Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

.2 **Anodized Finish:**

.1 AAMA 611, Dark Bronze, AA-M12C22A44, Class I, 0.018 mm.

**Part 3 Execution**

**3.1 EXAMINATION**

.1 Examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, wall and floor construction, and other conditions affecting performance.

.2 Examine roughing-in for electrical source power to verify actual locations of wiring connections.

.3 Proceed only after such discrepancies or conflicts have been resolved.

**3.2 INSTALLATION**

.1 Do not install damaged components. Fit frame joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.

.2 Entrances: Install automatic entrances plumb and true in alignment with established lines and grades without warp or rack of framing members and doors. Anchor securely in place.

.1 Install surface mounted hardware using concealed fasteners to greatest extent possible.

.2 Set headers, carrier assemblies, tracks, operating brackets and guides level and true to location with anchorage for permanent support.

.3 Door Operators: Connect door operators to electrical power distribution system as specified on Electrical drawings.

.4 Glazing: Glaze sliding automatic entrance door panels in accordance with the Glass Association of North America (GANA) Glazing Manual, published recommendations of glass product manufacturer, and published instructions of automatic entrance system manufacturer.

.5 Sealants: Comply with requirements specified in division 7 Section “Joint Sealants” to provide weather tight installation.

.1 Set thresholds, bottom guide and track systems and framing members in full bed of sealants.

.2 Seal perimeter of framing members with sealant.

.6 Signage: Apply signage on both sides of each door and sidelite as required by ANSI/BHMA A156.10 and manufacturers installation instructions.

## 3.3 FIELD QUALITY CONTROL

.1 Manufacturers Field Services:

.1 Manufacturer’s representative shall provide technical assistance and guidance for installation of doors.

.2 Before placing doors into operation, AAADM certified technician shall inspect and approve doors for compliance with ANSI/BHMA A156.10. Certified technician shall be approved by manufacturer.

## 3.4 ADJUSTING

.1 Adjust door operators, controls and hardware for smooth and safe operation and for weather tight closure. Adjust doors in compliance with ANSI/BHMA A156.10.

## 3.5 CLEANING AND PROTECTION

.1 Clean adjacent surfaces soiled by door installation.

.2 Clean glass and metal surfaces promptly after installation. Remove excess sealants, compounds, dirt and other substances. Repair damages finish to match original finish.

.1 Comply with requirements in Division 08 Section Glazing for cleaning and maintaining glass.

## 3.6 DEMONSTRATION

.1 Engage a factory-authorized representative to train Owner's maintenance personnel to adjust, operate, and maintain safe operation of the door.

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

.1 Aluminum Association (AA)

.1 Designation System for Aluminum Finishes (2000).

.2 American Architectural Manufacturers Association (AAMA)

.1 AAMA 1607, Installation Guidelines for Unit Skylights.

.3 American Society of the International Association for Testing and Materials (ASTM)

.1 ASTM B221, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

.2 ASTM E1748 - 95(2009), Standard Test Method for Evaluating the Engagement between Windows and Insect Screens as an Integral System.

.4 Canadian General Standards Board (CGSB)

.1 CAN/CGSB-1.40-[97], Anticorrosive Structural Steel Alkyd Primer.

.2 CAN/CGSB-79.1-[M91], Insect Screens.

.5 Canadian Standards Association (CSA) International

.1 CSA A440S1-09, Canadian Supplement to AAMA/WSMA/CSA 101/I.S.2/A440, NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights. (NAFS-08)

.2 AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS—North American Fenestration Standard/Specification for windows, doors and skylights. (NAFS-09)

.3 CAN/CSA-G164-[M92(R1998)], Hot Dip Galvanizing of Irregularly Shaped Articles.

.4 CAN/CSA-Z91-[M90(R2000)], Safety Code for Window Cleaning Operations.

### 1.2 SECTION INCLUDES

.1 Dome unit skylights mounted on existing or site-erected curbs.

### 1.3 SUBMITTALS

.1 In accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: for each type of unit skylight.

.1 Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for unit skylights.

.3 Shop Drawings:

.1 Include plans, elevations, sections, details, and connections to supporting structure and other adjoining Work.

.4 Samples:

.1 Aluminum Finish Samples: For each type of exposed finish required, in a representative section of each unit skylight in manufacturer's standard size.

.2 Glazing Samples: For each color and finish of glazing indicated, 12 inches (305mm) square and of same thickness indicated for the final Work.

**1.4 QUALITY ASSURANCE**

.1 Manufacturer Qualifications: A manufacturer capable of fabricating unit skylights that meet or exceed performance requirements indicated and of documenting this performance by inclusion in lists and by labels, test reports, and calculations.

.2 Installer Qualifications: An installer acceptable to unit skylight manufacturer for installation of units required for this Project.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

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

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

.4 Unused or damaged glazing materials are not recyclable and must not be diverted to municipal recycling programs.

.5 Divert unused or damaged wood materials from landfill to recycling facility approved by Contract Administrator.

.6 Divert unused metal materials from landfill to metal recycling facility approved by Contract Administrator.

.7 Divert unused caulking material from landfill to official hazardous material collections site approved by Contract Administrator.

.8 Plastic caulking tubes are not recyclable and must not be diverted for recycling with other plastic materials.

**1.6 WARRANTY**

.1 Skylight Warranty: Provide written warranty signed by manufacturer, agreeing to repair or replace Work that exhibits defects in materials or workmanship and guaranteeing weather-tight and leak-free performance. “Defects” is defined as uncontrolled leakage of water and abnormal aging or deterioration.

.1 Warranty Period: 2 years from date of Substantial Completion.

.2 Plastic Warranty: Provide written warranty signed by manufacturer agreeing to repair or replace Work that has or develops defects in the plastic. “Defects” is defined as abnormal aging or deterioration.

.1 Warranty Period for Acrylic: 2 years from date of Substantial Completion against yellowing.

.3 Finish Warranty: Provide written warranty signed by manufacturer agreeing to repair or replace Work with finish defects. “Defects” is defined as peeling, chipping, chalking, fading, abnormal aging or deterioration, and failure to perform as required.

.1 Warranty Period for Anodized Finish: 1 year from date of Substantial Completion.

.2 Warranty Period for Powder Coat Finish: 5 years from date of Substantial Completion.

.3 Warranty Period for Kynar 500 Finish: 5 years from date of Substantial Completion. (10 and 20 years available if specified)

**1.7 CLOSEOUT SUBMITTALS**

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

**Part 2 Products**

**2.1 MANUFACTURERS**

.1 Acceptable Manufacturers:

.1 Wasco Products Inc., Unit A, 85 Spencer Drive, PO Box 559, Wells, ME, 04090, (Tel) 207-216-4500, (Fax) 800-933-0593.

**2.2 PERFORMANCE REQUIREMENTS**

.1 Manufactured and pre-assembled windows, doors and skylights and their installation shall conform to:

.1 AAMA/WDMA/CSA 101/I.S.2/A440, NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights (NAFS-08)

.2 A440S1, “Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights (NAFS-09)

.2 All fenestration products shall bear a permanent marking indicating the fenestration product manufacturer’s identity in a location that is visible when the product is installed.

.3 Performance rating labels shall state that the windows comply with AAMA/WDMA/CSA 101/I.S.2/A440-08 (NAFS-08) and A440S1-09 (NAFS-09).

**2.3 MATERIALS**

.1 Materials: to NAFS-08 and NAFS-09 supplemented as follows:

.2 Curb Frame: Bright white high performance PVC with Bronze cap stock and minimum effective external wall thickness of 0.060 inch (1.5mm). Provide integral condensation gutter system with corners fully welded for waterproof quality.

.3 Retainer Frame: Extruded aluminum alloy 6063-T5 (min). ASTM B 221 (ASTM B 221 M) with minimum effective thickness of 0.060 inch (1.5 mm).

.4 Curbs: Site fabricated, as indicated.

.5 Plastic Sheets: Monolithic, formable, transparent (colorless, tinted or translucent white) sheets with good weather and impact resistant.

.1 Acrylic: ASTM D 4802, thermoformable, acrylic (methacrylate), Category C-2 or CC-2 Type UVA (formulated with ultraviolet absorber), with Finish 1 (smooth or polished), unless otherwise indicated.

.6 Thermal Break: Fabricate skylight units with thermal chambered PVC frame.

.7 Fasteners: Same metal as metals being fastened, or nonmagnetic stainless steel or other non-corrosive metal as recommended by manufacturer.

**2.4 SKYLIGHT UNITS**

.1 General: Factory-assembled, curb-mounted unit consisting of plastic glazing, gasketing, inner frame designed to mount on separate curb, and self-contained flashing.

.2 Curb: Site fabricated, as indicated.

.3 Condensation Control: Fabricate skylight units with integral internal gutters to collect condensation.

.4 Thermal Break: Fabricate skylight units with thermal chambered PVC.

.5 Shape and Size: As indicated by model number.

.6 Acceptable Products:

.1 Rectangular Dome Skylight: Wasco DDSS Double Dome Sentinel Fall Protection Curb Mount Skylight (or approved equal in accordance with B7).

.1 Dome shape.
.2 Double dome.
.3 Inner Dome: Clear.
.4 Outer Dome: Clear.
.5 Frame Finish: White interior, bronze exterior.
.6 Retainer: Mill finish.
.7 Size: As indicated.

.2 Round Dome Skylight: Wasco DDCCM Double Dome Circular Curb Mount Skylight (or approved equal in accordance with B7).

.1 Double dome.
.2 Inner Dome: Clear.
.3 Outer Dome: Clear.
.4 Frame Finish: White interior, bronze exterior.
.5 Retainer: Mill finish.
.6 Size: As indicated.

**2.5 FABRICATION**

.1 Fabricate in accordance with NAFS-08 and NAFS-09 supplemented as follows:

.2 Framing Components:

.1 Factory fit and assemble components.
.2 Fabricate components that, when assembled, will have accurately fitted joints with ends coped or mitered to produce hairline joints free of burrs and distortion.
.3 Fabricate components to drain water passing joints and condensation to the exterior.
.4 Fabricate components to accommodate expansion, contraction, and field adjustment, and to provide for minimum clearance and shimming at skylight perimeter.
.5 Fabricate components to ensure that glazing is thermally and physically isolated from framing members.
.6 Fit and secure PVC frame joints by thermal welding.
.7 Fit and secure aluminum retainer joints by heliarc welding.

**2.6 AIR BARRIER AND VAPOUR RETARDER**

.1 Equip skylight units with factory / site installed air barrier and vapour retarder material for sealing to building air barrier and vapour retarder as follows:

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

.2 Material width: adequate to provide required air tightness and vapour diffusion control to building air barrier and vapour retarder from interior.

**Part 3 Execution**

**3.1 EXAMINATION**

.1 Examine substrates and conditions, with installer present, for compliance with requirements for installation tolerances and other conditions affecting skylight performance.

.1 Proceed with installation only after unsatisfactory conditions have been corrected.

**3.2 INSTALLATION**

.1 Install in accordance with NAFS-08 and NAFS-09 supplemented as follows:

.2 Comply with manufacturer's written instructions for protecting, handling, and installing skylight components.

.3 Coordinate with installation of roof deck and other substrates to receive skylight units.

.4 Coordinate with installation of vapor barriers, roof insulation, roofing, and flashing as required to assure that each element of the Work performs properly and that combined elements are waterproof and weather tight. Anchor units securely to supporting structural substrates, adequate to withstand lateral and thermal stresses ass well as inward and outward loading pressures.

.5 Counter Flashing: Where counter flashing is required as component of the skylight, install to provide an adequate waterproof overlap with roofing or roof flashing (as counter flashing). Seal with thick bead of mastic sealant, except where overlap is indicated to be left open for ventilation.

**3.3 CLEANING**

.1 Clean exposed metal and plastic surfaces according to manufacturer's instructions. Touch up damaged metal coatings.

.2 Leave Work area free of all surplus materials, packing, and debris.

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

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

.1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction).

.2 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-69.17, Bored and Preassembled Locks and Latches.
.2 CAN/CGSB-69.18 /ANSI/BHMA A156.1, Butts and Hinges.
.3 CAN/CGSB-69.19/ANSI/BHMA A156.3, Exit Devices.
.4 CAN/CGSB-69.20/ANSI/BHMA A156.4, Door Controls (Closers).
.5 CAN/CGSB-69.21/ANSI/BHMA A156.5, Auxiliary Locks and Associated Products.
.6 CAN/CGSB-69.22/ANSI/BHMA A156.6, Architectural Door Trim.
.7 CAN/CGSB-69.24/ANSI/BHMA A156.8, Door Controls - Overhead Holders.
.8 CAN/CGSB-69.28 /ANSI/BHMA A156.12, Interconnected Locks and Latches.
.9 CAN/CGSB-69.29/ANSI/BHMA A156.13, Mortise Locks and Latches.
.10 CAN/CGSB-69.30/ANSI/BHMA A156.14, Sliding and Folding Door Hardware.
.11 CAN/CGSB-69.31/ANSI/BHMA A156.15, Closer/Holder Release Device.
.12 CAN/CGSB-69.32-M90/ANSI/BHMA A156.16-1981, Auxiliary Hardware.
.13 CAN/CGSB-69.33/ANSI/BHMA A156.17, Self-Closing Hinges and Pivots.
.14 CAN/CGSB-69.34/ANSI/BHMA A156.18, Materials and Finishes.
.15 CAN/CGSB-69.35/ANSI/BHMA A156.19, Power Assist and Low Energy Power Operated Doors.

### 1.2 SUBMITTALS

.1 Product Data:

.1 Submit manufacturer's printed product literature, specifications and data sheet in accordance with Section 01 33 00 - Submittal Procedures.
.2 Submit Contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
.3 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.

.2 Samples:

.1 Submit samples in accordance with Section 01 33 00 - Submittal Procedures.
.2 Identify each sample by label indicating applicable specification paragraph number, brand name and number, finish and hardware package number.
.3 After approval samples will be returned for incorporation in the Work.

.3 Manufacturer's Instructions: Submit manufacturer's installation instructions

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

## 1.3 REQUIREMENTS REGULATORY AGENCIES

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

## 1.4 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.

## 1.5 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 Contract Administrator.

.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.

## 1.6 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 The City and Contract Administrator.

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

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

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

## 1.7 WASTE MANAGEMENT AND DISPOSAL

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

.2 Place materials defined as hazardous or toxic waste in designated containers.

.3 Ensure emptied containers are sealed and stored safely for disposal away for public.

.4 Use chemical hardeners that are non-toxic, biodegradable and have zero or low VOC's.

.5 Dispose of surplus chemical and finishing materials in accordance with Federal, Provincial and Municipal regulations.

**1.8 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.

**Part 2 Products**

**2.1 HARDWARE ITEMS**

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

.2 Manufacture hardware to ANSI/BHMA standard for each specific item.

**2.2 DOOR HARDWARE**

.1 Locks and latches:

.1 Bored and preassembled locks and latches: to CAN/CGSB-69.17, 4000 bored lock, grade 1, designed for function and keyed as stated in Hardware Schedule.

.2 Mortise locks and latches: to CAN/CGSB-69.29, 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.

.2 Butts and hinges:

.1 Butts and hinges: to CAN/CGSB-69.18, designated by letter A and numeral identifiers, followed by size and finish, listed in Hardware Schedule.

.3 Exit devices:

.1 to CAN/CGSB-69.19, function, grade and finish as per schedule. Rim type with push pad design.

.4 Door Closers and Accessories:

.1 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule.

.5 Door Operators:

.1 Power-operated pedestrian doors: to CAN/CGSB-69.26.

.6 Auxiliary locks and associated products: to CAN/CGSB-69.21, designated by letter E and numeral identifiers listed in Hardware Schedule.

.1 Key into keying system as noted.

.7 Architectural door trim: to CAN/CGSB-69.22, 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.

.8 Auxiliary hardware: to CAN/CGSB-69.32, 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.

.9 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.

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

.11 Weatherstripping:

.1 Head and jamb seal:

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

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

## 2.3 MISCELLANEOUS HARDWARE

.1 Indexed key control system: to ANSI/BHMA A156.28, designated by letter E and numeral identifiers, wall mounted type.

.2 Refer to Section 28 13 01 – Electronic Security and Intrusion System Rough-In for door rough-in provisions. Security devices to be provided by The City and installed by others.

## 2.4 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 CAN/CGSB-69-21.

## 2.5 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.

**2.6 KEYING**

.1 Doors, padlocks and cabinet locks to be master keyed as directed. Prepare detailed keying schedule in conjunction with Contract Administrator and The City.

.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 cores.

.6 Provide all permanent cores and keys to Contract Administrator.

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

**2.7 SUBSTITUTIONS**

.1 In accordance with B7.

**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 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 Contract Administrator; 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 Subcontractor to accept responsibility.

**3.4 FIELD QUALITY CONTROL**

.1 Hardware Subcontractor 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 manufacturer’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 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 Contract Administrator.

.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.

**3.9 HARDWARE GROUPS**

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

**Hardware Schedule**

**Set: 1.0**

| | | | | |
|---|---|---|---|---|
| 6 | Hinge | TA2714 4-1/2" x 4" | US26D | MK |
| 1 | Hinge | TA2714 CC4 4-1/2" x 4" | US26D | MK |
| 2 | Flush Bolt | 557 | US26D | RO |
| 1 | Dust Proof Strike | 570 | US26D | RO |
| 1 | Mortise Deadlock | L460 P 10-078 | 626 | SC |
| 1 | Pull Plate | 107x70C | US32D | RO |
| 1 | Push Plate | 70C | US32D | RO |
| 1 | Concealed Overhead Stop | 2-X36 | 652 | RF |
| 1 | Auto Operator | SW100 | 689 | BM |
| 2 | Kick Plate | K1050 10" | US32D | RO |
| 2 | Actuator | 639 | | NO |
| 1 | Monitor | LML-1 | | SU |

Notes: Wire actuators through the LML-1 latch monitor. Actuators to only be active when deadbolt is retracted. Overhead stop for use on inactive leaf. Auto operator to have built in stop. Active leaf to have 4 hinges. Inactive leaf to have 2 regular hinges and 1 through wire hinge.

**Set: 2.0**

| | | | | |
|---|---|---|---|---|
| 2 | Closer | 1431 UO | EN | SA |
| 1 | Balance of Hardware is Existing to Remain | | | 00 |

**Set: 3.0**

| | | | | |
|---|---|---|---|---|
| 4 | Hinge | TA2714 4-1/2" x 4" | US26D | MK |
| 1 | Mortise Deadlock | L496 P 10-078 | 626 | SC |
| 1 | Pull Plate | 107x70C | US32D | RO |
| 1 | Push Plate | 70C | US32D | RO |
| 1 | Auto Operator | SW100 | 689 | BM |
| 1 | Kick Plate | K1050 10" | US32D | RO |
| 2 | Actuator | 639 | | NO |
| 1 | Monitor | LML-1 | | SU |

Notes: Wire actuators through the LML-1 latch monitor. Actuators to only be active when deadbolt is retracted. Auto operator to have built in stop.

**Set: 4.0**

| | | | | |
|---|---|---|---|---|
| 3 | Hinge | TA2714 NRP 4-1/2" x 4" | US26D | MK |
| 1 | Storeroom Lock | ND80 P D SAT | 626 | SC |
| 1 | Surface Overhead Stop | 55-X36 | 652 | RF |

**Set: 5.0**

| | | | | |
|---|---|---|---|---|
| 4 | Hinge | TA2714 NRP 4-1/2" x 4" | US26D | MK |
| 1 | Mortise Deadlock | L460 P 10-078 | 626 | SC |
| 1 | Auto Operator | SW100 | 689 | BM |
| 1 | Kick Plate | K1050 10" | US32D | RO |
| 2 | Actuator | 639 | | NO |
| 1 | Monitor | LML-1 | | SU |

Notes: Wire actuators through the LML-1 latch monitor. Actuators to only be active when deadbolt is retracted.

**Set: 6.0**

| | | | | |
|---|---|---|---|---|
| 4 | Hinge | TA2714 4-1/2" x 4" | US26D | MK |
| 1 | Privacy Set | ND40S RHO | 626 | SC |

| | | | | |
|---|---|---|---|---|
| 1 | Closer | 1431 UO | EN | SA |
| 1 | Kick Plate | K1050 10" | US32D | RO |
| 1 | Wall Stop | 406 | US32D | RO |

**Set: 7.0**

| | | | | |
|---|---|---|---|---|
| 3 | Hinge | TA2314 NRP 4-1/2" x 4" | US26D | MK |
| 1 | Exit Device | 8804 PSB | US32D | SA |
| 1 | Rim Cylinder | BEST to suit | 626 | BE |
| 1 | Electric Strike | 9600 | 630 | HS |
| 1 | Concealed Overhead Stop | 6-X36 | 630 | RF |
| 1 | Closer | 1431 UO | EN | SA |
| 1 | Kick Plate | K1050 10" | US32D | RO |
| 1 | Threshold | 272A | | PE |
| 1 | Gasketing | 2891AS | | PE |
| 1 | Sweep | 315CN | | PE |
| 1 | Card Reader | By Others | | 00 |
| 1 | Power Supply | By Others | | 00 |

Notes: Install closer to gasketing.

**Set: 8.0**

| | | | | |
|---|---|---|---|---|
| 1 | Mortise Cylinder | BEST to Suit | 626 | BE |
| | Balance of Hardware by Door Supplier | | | |

**Set: 9.0**

| | | | | |
|---|---|---|---|---|
| 4 | Hinge | TA2714 4-1/2" x 4" | US26D | MK |
| 1 | Storeroom Lock | ND80 P D RHO | 626 | SC |
| 1 | Electric Strike | 5000C | 630 | HS |
| 1 | Auto Operator | SW100 | 689 | BM |
| 1 | Kick Plate | K1050 10" | US32D | RO |
| 1 | Relay | RLP-24 | | SU |
| 2 | Actuator | 639 | | NO |
| 1 | Card Reader | By Others | | 00 |
| 1 | Digital Entry | DK-16 | | SU |
| 1 | Power Supply | By Others | | 00 |
| 1 | Power Supply | BPS-24-1 | | SU |

Notes: Door always locked. Push side actuator normally disabled. Entering valid code will release the electric strike and enable the push side actuator which will power open the door when pushed. Pushing the pull side actuator will always release the electric strike and power open the door when pushed. Operator to have built in stop.

**Set: 10.0**

| | | | | |
|---|---|---|---|---|
| 4 | Hinge | TA2714 4-1/2" x 4" | US26D | MK |
| 1 | Office Lock | ND53 P D RHO | 626 | SC |
| 1 | Door Stop | 441H | US26D | RO |

**Set: 11.0**

| | | | | |
|---|---|---|---|---|
| 4 | Hinge | TA2314 NRP 4-1/2" x 4" | US26D | MK |
| 1 | Exit Device | 8804 PSB | US32D | SA |
| 1 | Rim Cylinder | BEST to suit | 626 | BE |
| 1 | Concealed Overhead Stop | 6-X36 | 630 | RF |
| 1 | Closer | 1431 UO | EN | SA |
| 1 | Kick Plate | K1050 10" | US32D | RO |
| 1 | Threshold | 272A | | PE |
| 1 | Gasketing | 2891AS | | PE |
| 1 | Sweep | 315CN | | PE |

Notes: Install closer to gasketing.

**END OF SECTION**

## Part 1 General

### 1.1 REFERENCES

.1 AN ANSI/ASTM E330- 02, Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference

.2 American National Standards Institute (ANSI).

.1 ANSI/ASTM E330-[02], Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.

.3 American Society for Testing and Materials International, (ASTM).

.1 ASTM C542-[94(1999)], Specification for Lock-Strip Gaskets.

.2 ASTM D790-[02], Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

.3 ASTM D1003-[00], Test Method for Haze and Luminous Transmittance of Plastics.

.4 ASTM D1929-[96(R2001)e1], Test Method for Determining Ignition Temperature of Plastics.

.5 ASTM D2240-[02b], Test Method for Rubber Property - Durometer Hardness.

.6 ASTM E84-[01], Test Method for Surface Burning Characteristics of Building Materials.

.7 ASTM F1233-[98], Test Method for Security Glazing Materials and Systems.

.4 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.1-[M90], Tempered or Laminated Safety Glass.

.2 CAN/CGSB-12.2-[M91], Flat, Clear Sheet Glass.

.3 CAN/CGSB-12.3-[M91], Flat, Clear Float Glass.

.4 CAN/CGSB-12.4-[M91], Heat Absorbing Glass.

.5 CAN/CGSB-12.5-[M86], Mirrors, Silvered.

.6 CAN/CGSB-12.6-[M91], Transparent (One-Way) Mirrors.

.7 CAN/CGSB-12.8-[97], Insulating Glass Units.

.8 CAN/CGSB-12.9-[M91], Spandrel Glass.

.9 CAN/CGSB-12.10-[M76], Glass, Light and Heat Reflecting.

.10 CAN/CGSB-12.11-[M90], Wired Safety Glass.

.11 CAN/CGSB-12.12-[M90], Plastic Safety Glazing.

.12 CAN/CGSB-12.13-[M91], Patterned Glass.

.5 Canadian Standards Association (CSA International).

.1 CSA A440S1-09, Canadian Supplement to AAMA/WSMA/CSA 101/I.S.2/A440, NAFS – North American Fenestration Standard/Specification for windows, doors, and skylights. (NAFS-08)

.2 AAMA/WDMA/CSA 101/I.S.2/A440-08, NAFS—North American Fenestration Standard/Specification for windows, doors and skylights. (NAFS-09)

.6 Environmental Choice Program (ECP).

.1 CCD-045-[95], Sealants and Caulking.

.7 Flat Glass Manufacturers Association (FGMA).

.1 FGMA Glazing Manual - [1997].

.8 Laminators Safety Glass Association (LSGA).

.1 LSGA Laminated Glass Design Guide [2000].

**1.2 SYSTEM DESCRIPTION**

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

.1 Utilize inner light of multiple light sealed units for continuity of air and vapour seal.

.2 Size glass to withstand wind loads, dead loads and positive and negative live loads in accordance with ASTM E 300-97el.

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

**1.3 SUBMITTALS**

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

.2 Shop Drawings: Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.3 Manufacturer's Instructions: Submit manufacturer's installation instructions.

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

**1.4 QUALITY ASSURANCE**

.1 Perform work in accordance with FGMA Glazing Manual IGMAC and Laminators Safety Glass Association – Standards Manual for glazing installation methods. Provide shop inspection and testing for glass.

.3 Provide certificate of quality compliance from manufacturer.

**1.5 WASTE MANAGEMENT AND DISPOSAL**

.1 Separate and recycle waste materials in accordance with Section 01 74 00 – Cleaning and Waste Management.

**1.6 WARRANTY**

.1 Provide ten (10) year warranty for glazing units.

**1.7 ENVIRONMENTAL REQUIREMENTS**

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

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

## Part 2 Products

### 2.1 GLASS MATERIALS

.1 Float Glass: to CAN/CGSB-12.3, Glazing quality, 6mm thick

.2 Exterior Insulating Sealed Glass Units (EGU): to CAN/CGSB-12.8.

.3 Spandrel glass: to Section 08 81 00 – Spandrel Glazing.

.4 Safety glass: to CAN/CGSB-12.5, Type 1, 2 layers of 6 mm thick glass, laminated (12 mm total thickness) and Type 2, 6mm thick tempered.

.5 Wired Glass: to CAN/CGSB-12.11, Type 1, wired mesh style 3, 6mm thick

.6 Mirrors: to CAN/CGSB-12.5, silvered, Type A, 6mm thick, unframed, ground and polished edges, of sizes as indicated.

.7 Glass for cabinet and millwork: to CAN/CGSB-12.5, transparent, minimum 4.0 mm thick, unless otherwise indicated. Type 2 - Tempered.

### 2.2 SEALED INSULATING GLASS

.1 Exterior Units:

.1 Dual Pane Sealed Glazing Units:

.1 Outer board: 6 mm tempered glazing.

.2 Inter-cavity space thickness: 13 mm.

.3 Inner board: 6 mm tempered glazing.

.4 Glass coating: surface number 2, low “E”

.1 Cardinal Glass; 272 coating.

.5 Inert gas: argon.

.6 Light transmittance: minimum 0.70.

### 2.3 INTERIOR GLAZING SCREENS AND WINDOWS

.1 Safety glass: to CAN/CGSB 12.5, Type 2, 6mm thick tempered.

### 2.4 INTERIOR WOOD AND METAL DOORS

.1 Safety glass: to CAN/CGSB-12.5, Type 2, 6mm thick tempered. Sizes as indicated.

### 2.5 INTERIOR STRUCTURAL GLAZING / GLAZED PARTITIONS

.1 Structural glass: to CAN/CGSB-12.20-m, 2 layers of 6mm laminated glass, laminated (13mm total thickness).

### 2.6 SEALANT MATERIALS

.1 Sealant: one component compound, to CAN/CGSB-19.13, Class 2-40, neutral cure silicone gun grade, colour to match adjacent surfaces.

### 2.7 ACCESSORIES

.1 Setting blocks: Neoprene, 80-90 Shore A durometer hardness to ASTM D2240, length of 25 mm for each square meter of glazing, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height, to suit glazing method, glass light weight and area.

.2 Spacer shims: Neoprene, 50-60 Shore A durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self adhesive on one face.

.3 Glazing tape:

.1 Preformed butyl compound 10-15 Shore A durometer hardness to ASTM D2240; coiled on release paper; size to suit application; black colour.

.2 Closed cell polyvinyl chloride foam, coiled on release paper over adhesive on two sides, maximum water absorption by volume 2%, designed for compression of 25%, to effect an air and vapour seal.

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

.5 Glazing clips: manufacturer's standard type.

.6 Lock-strip gaskets: to ASTM C542.

.7 Polyester Glazing film:

.1 Acceptable Manufacturer: 3M

.2 Acceptable Product: 3M™ Fasara™ Glass Finish SH2FGAR Aerina (1.27 m x 30 m)

.3 Locations: As indicated.

.8 Mirror attachment accessories:

.1 Stainless steel clips.

.2 Plastic rosettes.

.3 Mirror adhesive, chemically compatible with mirror coating and wall substrate.

.4 Mirror frame

## Part 3 Execution

### 3.1 MANUFACTURER'S INSTRUCTIONS

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

### 3.2 EXAMINATION

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

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

### 3.3 PREPARATION

.1 Clean 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 Install Sealant according to Manufacturer's instructions.

**3.4 INSTALLATION TEMPERED GLASS**

.1 Install tempered glass with horizontal tempering, that is, with tempered distortion parallel with floor.

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

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

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

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

.4 Place setting blocks at ¼ points, with edge block maximum 150 mm from corners.

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

.6 Install removable stops with spacer strips inserted between glazing and applied stops 6 mm below sight line. Place glazing tape on glazing light or unit with tape flush with 16 mm below sight line.

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

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

**3.6 INSTALLATION: INTERIOR - DRY METHOD (TAPE AND TAPE)**

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

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

.3 Place setting blocks at ¼ points, with edge block maximum 150 mm from corners.

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

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

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

.7 Knife trim protruding tape.

**3.7 INSTALLATION: MIRRORS**

.1 Set mirrors with adhesive, applied in accordance with adhesive manufacturer's instructions.

.2 Set mirrors with clips. Anchor rigidly to wall construction.

.3 Set in frame.

.4 Place plumb and level.

**3.8 INSTALLATION: GLAZING FILM**

.1 Install plastic film with adhesive, applied in accordance with film manufacturer's instructions.

.2 Place without air bubbles, creases or visible distortion.

.3 Fit tight to glass perimeter with razor cut edge.

**3.9 CLEANING**

.1 Perform cleaning after installation to remove construction and accumulated environmental dirt. Remove traces of primer, caulking.

.2 Remove glazing materials from finish surfaces.

.3 Remove labels after work is complete.

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

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

**3.10 PROTECTION OF FINISHED WORK**

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

**END OF SECTION**