

Part 1 General

1.1 REFERENCES

- .1 ASTM D 523 - Standard Test Method for Specular Gloss.
- .2 ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.
- .3 ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .4 SDI 100 - Recommended Specifications for Steel Doors and Frames.

1.2 PERFORMANCE REQUIREMENTS

- .1 Door opening assemblies:
 - .1 Maximum flame spread 25 in accordance with ASTM E 84, self-extinguishing in accordance with ASTM D 635.
 - .2 Fire rated assemblies: Comply with requirements of WHI/ UL10B, NFPA 252, and ASTM E 152; UL<Insert Value>rating, with doors and frames bearing rating labels.
 - .3 Fire rated assemblies: Comply with requirements of WHI/UL10B, NFPA 252, and ASTM E 152; UL ratings indicated on drawings, with doors and frames bearing rating labels.
 - .4 Non Rated assemblies: Comply with requirements of ASTM F 1642-04 and GSA- TSO1-2003 Low Level Blast Resistance, Test Reports Required.

1.3 SUBMITTALS

- .1 Submit under provisions of Section 01 33 00.
- .2 Submit Manufacturer's data sheets on each product to be used, including:
 - .1 Preparation instructions and recommendations.
 - .2 Storage and handling requirements and recommendations.
 - .3 Installation methods.
- .3 Shop Drawings:
 - .1 Plans: Indicate location of each door opening assembly in project.
 - .2 Elevations: Dimensioned elevation of each type door opening assembly in project; indicate sizes and locations of door hardware, and lites and louvers, if specified.
 - .3 Details: Installation details of each type installation condition in project; indicate installation details of glazing, if specified.
 - .4 Schedule: Indicate each door opening assembly in project; cross-reference to plans, elevations, and details.
- .4 Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.

- .5 Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

1.4 QUALITY ASSURANCE

- .1 Manufacturer Qualifications: Company specializing in manufacturing fiberglass doors and frames with a minimum documented experience of 25 years.

1.5 DELIVERY, STORAGE, AND HANDLING

- .1 Deliver materials in manufacturer's unopened, undamaged packaging, with manufacturer's labels intact.
- .2 Inspect and report damage to doors at time of delivery.
- .3 Store products in manufacturer's unopened packaging until ready for installation.
- .4 Store door assemblies in on end, to prevent damage to face corners and edges.

1.6 WARRANTY

- .1 Section 01 10 10 General Requirements: MTA University Warranties.
- .2 Provide warranty to include coverage for failure to meet specified requirements.
- .3 Manufacturer's Warranty: Manufacturer's 25-year warranty against failure due to corrosion from specified environment.

Part 2 Products

2.1 MATERIALS

- .1 Fibreglass Mat: Pultruded, minimum two (2) ounces per square foot.
- .2 Resins: Manufacturer's formulation for fabricating units to meet specified requirements.
- .3 Finish: Seamless smooth face, 25 mil matte, gelcoat finish, selected by Architect from manufacturer's full range of colors
- .4 Anchors: Manufacturer's standard stainless steel expansion anchors for existing openings, and stainless steel masonry tee anchors for new construction.
- .5 Fasteners: Stainless steel.

2.2 COMPONENTS

- .1 Non-rated Fiberglass Reinforced Plastic (FRP) Doors:
 - .1 Construction:
 - .1 Core: Honeycomb Core: Phenolic impregnated resin paper honeycomb.
 - .2 Door Plates: Molded in one continuous piece, resin reinforced with hand-laid glass fiber mat, nominal 3 mm (1/8 inch) thick.
 - .2 Door Edges: Fiberglass mat reinforced, nominal 9.5 mm (3/8 inch) thick, machine tooled resin rich FRP matrix.
 - .3 Glazing: refer to specification Section 08 80 50.
 - .4 Sizes: Indicated on drawings.
- .2 Non-rated Fiberglass Frames:

- .1 Construction: One-piece pultruded fiberglass reinforced plastic, minimum 6mm (1/4 inch) wall thickness, jamb-to-head joints mitered and reinforced with FRP clips and stainless steel fasteners; conforming to SDI 100 requirements for performance equivalent to 14 gauge steel frames.
- .2 Frame profile: 146 mm (5-3/4 inches) deep, 51 mm (2 inches) wide face; double rabbeted with 16 mm (5/8 inch) high stop.
- .3 Sizes: Indicated on drawings.
- .3 Door Hardware: Specified in Section 08 71 00.

2.3 FABRICATION

- .1 Fiberglass Reinforced Plastic (FRP) Doors:
 - .1 Minimum glass fiber to resin ratio: 35 percent.
 - .2 Mortise for lockset, and recess for strike plate in lock stile.
 - .3 Solid block FRP reinforcement for hinges other indicated hardware; provide for hinge leaf recesses in hinge stile. No metal reinforcement permitted.
- .2 Fiberglass Frames:
 - .1 One piece frame, resin bonded and factory assembled.
 - .2 Mortise for lock strike, and recess for strike plate in lock jamb.
 - .3 Solid block FRP for hinges and other indicated hardware. No metal reinforcement permitted.

Part 3 Execution

3.1 EXAMINATION

- .1 Verify openings are ready to receive work and opening dimensions and clearances are as indicated on approved shop drawings. Do not begin installation until openings have been properly prepared.
- .2 If opening preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- .1 Acclimate doors and frames to site conditions for a minimum of 24 hours before installation.
- .2 Do not remove labels from fire-rated doors and frames.

3.3 INSTALLATION

- .1 Install door opening assemblies in accordance with approved shop drawings, SDI 100, and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.
- .2 Use anchorage devices to securely fasten sliding door assembly to wall construction without distortion or imposed stresses. Use a minimum of three (3) anchors per jamb.
- .3 Coordinate installation of thermal insulation at shim spaces at frame perimeter.
- .4 Installation of door hardware is specified in Section 08 71 00.

- .5 Install door hardware in accordance with manufacturer's printed instructions, using through-bolts to secure surface applied hardware.
- .6 Site Tolerances: Maintain plumb and level tolerances specified in manufacturer's printed installation instructions.

3.4 ADJUSTING

- .1 Adjust doors in accordance with door manufacturer's maintenance instructions to swing open and shut without binding, and to remain in place at any angle without being moved by gravitational influence.
- .2 Adjust door hardware to operate correctly in accordance with hardware manufacturer's maintenance instructions.

3.5 CLEANING

- .1 Clean surfaces of door opening assemblies and sight-exposed door hardware in accordance with manufacturer's maintenance instructions.
- .2 Remove labels and visible markings.

3.6 PROTECTION

- .1 Protect installed products until completion of project.
- .2 Touch-up, repair or replace damaged products before Substantial Completion.

3.7 SCHEDULE

- .1 Schedules: Refer to Door Schedule indicated on drawings

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ASTM A480/A480M-11 - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.
- .2 ASTM A653/A653M-10 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .3 ASTM A666-10 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- .4 ASTM B209M-07 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .5 ASTM B209-07 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .6 ASTM B221M-07 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .7 ASTM B221-08 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- .8 CSA-C22.2 No. 100-04 (R2009) - Motors and Generators.
- .9 CAN/CSA-C22.2 No. 247-92 (R2008) - Operators and Systems of Doors, Gates, Draperies and Louvres.
- .10 CSA-C22.1-09 - Canadian Electrical Code, Part I (21st Edition), Safety Standard for Electrical Installations.
- .11 NEMA 250-2008 - Enclosures for Electrical Equipment (1000 Volt Maximum).
- .12 NEMA ICS 2-2000 (R2005) - Industrial Control and Systems: Controllers, Contactors, and Overload Relays Rated 600 Volts.
- .13 NEMA MG 1-2009, Rev 1-2010 - Motors and Generators, Revision 1.
- .14 UL 325-2002 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems (5th Edition).
- .15 ULC - Fire Resistance Directory.

1.2 SYSTEM DESCRIPTION

- .1 Electric motor operated unit with manual override in case of power failure.
- .2 Coiling Door: Surface mounted.

1.3 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data: Provide general construction component connections details electrical components.
- .3 Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

1.4 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including installation sequence and procedures, adjustment and alignment procedures.

1.5 CLOSEOUT SUBMITTALS

- .1 Operation and Maintenance Data: Indicate lubrication requirements and frequency, periodic adjustments required.

1.6 REGULATORY REQUIREMENTS

- .1 Products Requiring Electrical Connection: Listed and classified by CSA as suitable for the purpose specified and indicated.

1.7 WARRANTY

- .1 Section 01 77 00: Closeout Procedures.
- .2 Provide extended warranty to include coverage for failure to meet specified requirements, to the following term:
 - .1 Two (2) years beyond Substantial Performance.

Part 2 Products

2.1 MANUFACTURERS

- .1 Wayne-Dalton; Product: 800c Series.
- .2 Other acceptable manufacturers offering functionally and aesthetically equivalent products.
 - .1 Overhead Door Company; Product: submit similar for approval.
 - .2 McKeon; Product: submit similar for approval.
- .3 Substitutions: Refer to Section 01 10 10 General Requirements.

2.2 MATERIALS & OPTIONS

- .1 Guides: Roll-formed steel channel: To CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653/A653M, G90 (Z275). Galvanized steel bolted to wall.
- .2 Sheet Steel: Galvanized steel to ASTM A653/A653M, commercial grade (CS), Type B. Coating designation G90 (Z275).
- .3 Hood Enclosure: 22 gauge, internally reinforced to maintain rigidity and shape. Provide UL Classified smoke seals on each guide assembly.
- .4 Curtain: 18 gauge cold rolled, galvanize steel slats or as required for ULC Listing.
 - .1 Insulation: Fill slats with Polyurethane Foamed-in-Place Insulation.
- .5 Counter balance, guides, brackets and bars: Steel sections as recommended by manufacturer to maintain rating and c/w UL Classified smoke seals.

2.3 HARDWARE

- .1 Hardware:
 - .1 Cylinders: Best core type; keyed master keyed to building.
 - .2 Handle: Inside center mounted, adjustable keeper, spring activated latch bar with feature to keep in locked or retracted position; exterior handle.
 - .3 Weatherstripping: Moisture and rot proof, resilient type, located at bottom of curtain.

2.4 ELECTRIC OPERATOR

- .1 Electric Operator:
 - .1 Description: CAN/CSA-C22.2 No. 247, side mounted.
 - .2 Motor Enclosure: NEMA MG1 Type 1; General Purpose.
 - .3 Motor Voltage: 120volt, single phase, 60 Hz.
 - .4 Motor Controller: NEMA ICS2, full voltage, reversing magnetic motor starter.
 - .5 Controller Enclosure: NEMA 250, Type 1.
 - .6 Brake: Adjustable friction clutch type, activated by motor controller.
- .2 Control Station: Standard three button (OPEN-STOP-CLOSE) control for each operator; 24volt circuit; momentary.
- .3 Safety Edge: Located at door bottom, full width, electro-mechanical sensitized type, wired to door to reverse upon striking object; hollow neoprene covered weather seal.

2.5 FINISHES

- .1 Curtain Slats: Precoated paint finish, powder coat type, colour as selected.
- .2 Steel Guides and Hood Enclosure: Prime paint.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 10 10 General Requirements: Verify existing conditions before starting work.
- .2 Verify that opening sizes, tolerances and conditions are acceptable.

3.2 INSTALLATION

- .1 Install door unit assembly to manufacturer instructions.
- .2 Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- .3 Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- .4 Fit and align assembly including hardware; level and plumb, to provide smooth operation.

- .5 Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 92 00.
- .6 Install perimeter trim and closures.

3.3 ERECTION TOLERANCES

- .1 Section 01 10 10 General Requirements: Tolerances.
- .2 Maintain dimensional tolerances and alignment with adjacent work.
- .3 Maximum Variation from Plumb: 1.5 mm.
- .4 Maximum Variation from Level: 1.5 mm.
- .5 Longitudinal or Diagonal Warp: Plus or minus 3 mm per 3 m straight edge.

3.4 ADJUSTING

- .1 Adjust door, hardware and operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- .1 Section 01 74 11: Cleaning installed work.
- .2 Clean door and components.
- .3 Remove labels and visible markings.

END OF SECTION

Part 1 GENERAL

1.1 REFERENCE STANDARDS

- .1 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
 - .1 CSDFMA Canadian Metric Guide for Steel Doors and Frames (Modular Construction): standard hardware location dimensions.

- .2 NFPA – National Fire Protection Agency.
 - .1 NBC
 - .2 NFPA-80
 - .3 NFPA101 – Life Safety
 - .4 NFPA-105 – Smoke and Draft Control

- .3 American National Standards Institute, ANSI A117.1 Specification
 - .1 ANSI/BHMA A156.1-2013, Butts and Hinges.
 - .2 ANSI/BHMA A156.2-2011, Bored & Preamsembled Locks and Latches.
 - .3 ANSI/BHMA A156.3-2014, Exit Devices.
 - .4 ANSI/BHMA A156.4-2013, Door Controls - Closers.
 - .5 ANSI/BHMA A156.5-2014, Cylinders and Input Devices for Locks.
 - .6 ANSI/BHMA A156.6-2010, Architectural Door Trim.
 - .7 ANSI/BHMA A156.8-2010, Door Controls - Overhead Stops & Holders.
 - .8 ANSI/BHMA A156.7-2014, Template Hinge Dimensions.
 - .9 ANSI/BHMA A156.12-2011, Interconnected Locks and Latches.
 - .10 ANSI/BHMA A156.13-2012, Mortise Locks and Latches.
 - .11 ANSI/BHMA A156.15-2011, Release Devices - Closer/Holder.
 - .12 ANSI/BHMA A156.16-2013, Auxiliary Hardware.
 - .13 ANSI/BHMA A156.18-2012, Materials and Finishes.
 - .14 ANSI/BHMA A156.19-2013, Power Assist & Low Energy Power Operated Doors.
 - .15 ANSI/BHMA A156.21-2014, Thresholds.
 - .16 ANSI/BHMA A156.22-2012, Door Gasketing.
 - .17 ANSI/BHMA A156.25-2013, Electrified Locking Devices.
 - .18 ANSI/BHMA A156.26-2012, Continuous Hinges.

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 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 Hardware List:
 - .1 Submit contract hardware list in accordance with Section 01 33 00 - Submittal Procedures.
 - .2 Indicate specified hardware, including make, model, material, function, size, finish and other pertinent information.
- .4 Manufacturer's Instructions and Electrical Wiring and Riser Diagrams:
 - .1 Submit manufacturer's installation instructions, wiring and riser diagrams for all electrical hardware components listed in the schedule.
- .5 Closeout Submittals
 - .1 Provide operation and maintenance data for door closers, locksets, door holders, electrified hardware, and fire exit hardware for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

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

1.4 DELIVERY, STORAGE, AND HANDLING

- .1 Packing, Shipping, Handling and Unloading:
 - .1 Deliver, store, handle and protect materials in accordance with Section 01 61 00 - Common Product Requirements.
 - .2 Package each item of hardware including fastenings, separately or in like groups of hardware, label each package as to item definition and location.
- .2 Storage and Protection:
 - .1 Store finishing hardware in locked, clean and dry area.

1.5 WASTE DISPOSAL AND MANAGEMENT

- .1 Separate and recycle waste materials in accordance with Section 01 74 22 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.

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

1.6 MAINTENANCE

- .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Supply two sets of wrenches for door closers, locksets, and fire exit hardware.

Part 2 PRODUCTS

2.1 HARDWARE ITEMS

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

2.2 DOOR HARDWARE

- .1 Locks and latches - Mortise:
 - .1 Mortise locks and latches: to CAN/CGSB-69.29, series 1000 mortise lock, grade 1, designed for function and keyed as directed Departmental Representative, and as listed in Hardware Schedule.
 - .2 Lever handles: solid cast flat design, with full return to door.
 - .3 Roses: 54 mm diameter, round.
 - .4 Normal strikes: box type, lip projection not beyond jamb.
 - .5 Cylinders: Existing Schlage Restricted Keyway for keying system as directed.
 - .6 Latchbolts: to be two-piece anti-friction, ¾" throw.
 - .7 Lock functions: to be supplied as listed in hardware schedule.
 - .8 Finished to 630, Satin Stainless Steel.
 - .9 Specified products: Schlage L9000Series-06
- .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.
 - .2 Specified products: Butt Hinges - Ives 3CB1 - 630
- .3 Door Closers and Accessories:
 - .1 Door controls (closers): to CAN/CGSB-69.20, designated by letter C and numeral identifiers listed in Hardware Schedule, non-sized, finished to 689.
 - .2 Door controls - overhead holders: to CAN/CGSB-69.24, designated by letter C and numeral identifiers listed in Hardware Schedule, finished to 630.
 - .3 Door closers to have heavy duty forged steel arms, brackets and mounting plates, closing and backcheck selector valves, spring power adjustment, SRI coating.
 - .4 Specified products: Door closers - LCN 4040XP SRI Series
 - .5 Specified products: Overhead holders – Glynn-Johnson 904S Series - 630

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- .4 Auxiliary locks and associated products:
 - .1 to CAN/CGSB-69.21, designated by letter E and numeral identifiers listed in Hardware Schedule, finished to 626.
 - .2 Cylinders: standard rim or mortise, finished to 626, for installation in exit device trim on doors as listed in Hardware Schedule. Key into keying system as directed.

 - .5 Architectural door trim:
 - .1 to CAN/CGSB-69.22, designated by letter J and numeral identifiers listed in Hardware Schedule, finished to 630.
 - .2 Door protection plates: kick plate type J01, 1.27 mm thick stainless steel, finished to 630.
 - .3 Push plates: type J01, 1.27 mm thick stainless steel, edge beveled, size as listed in Hardware Schedule, finished to 630.
 - .4 Specified products: Ives Hardware

 - .6 Auxiliary hardware: to CAN/CGSB-69.32, designated by letter L and numeral identifiers listed in Hardware Schedule, finished to 626.
 - .1 Door stop, floor mounted: universal type, rubber bumper, finish to 626.
 - .2 Specified products: Door stops - Ives Hardware;

 - .7 Door bottom seal: heavy duty, door seal of extruded aluminum frame and solid closed cell neoprene seal, surface mounted, closed ends, adjustable automatic retract mechanism when door is open, clear anodized finish.
 - .1 Specified products: Zero

 - .8 Thresholds: 127/150 mm wide x full width of door opening, extruded aluminum mill finish, serrated surface, with thermal break of rigid PVC.
 - .1 Specified products: Zero

 - .9 Weatherstripping:
 - .1 Head and jamb seal:
 - .1 Extruded aluminum frame and solid closed cell neoprene insert, clear anodized finish.
 - .2 Door bottom seal:
 - .1 Extruded aluminum frame and closed cell neoprene sweep, clear anodized finish.
 - .3 Specified products: Zero

 - .10 Electric Strikes, Power Supplies, Power Transfers:
 - .1 Electric strikes: to meet or exceed UL Listed Burglary Resistant CVXY, ANSI E59311 & E59321, Grade 1 requirements; to be heavy duty with all Stainless Steel construction; to accept 3/4" throw latchbolts and be horizontally adjustable.
 - .2 Power Supplies: to be sized to suit door hardware requirements and with options included for fire alarm and access control functions.
 - .3 Power Transfers: to be UL Listed heavy-duty, concealed when door is closed, with wiring connections as required.
 - .4 Specified products: Von Duprin.

2.3 FASTENINGS

- .1 Use only fasteners provided by manufacturer. Failure to comply may void warranties and applicable licensed labels.
- .2 Supply screws, bolts, expansion shields and other fastening devices required for satisfactory installation and operation of hardware.
- .3 Exposed fastening devices to match finish of hardware.
- .4 Where pull is scheduled on one side of door and push plate on other side, supply fastening devices, and install so pull can be secured through door from reverse side. Install push plate to cover fasteners.
- .5 Use fasteners compatible with material through which they pass.

2.4 KEYING

- .1 Door locks, and exit device trims to be keyed differently and master keyed under Existing Schlage Restricted Keyway keying system for SABS as directed. Prepare keying schedule in conjunction with Project Manager and Department / Project Representative.
- .2 Provide keys in triplicate (3) for every lock in this Contract.
- .3 Provide three (3) masterkeys for each MK group.

Part 3 EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.
- .2 Furnish metal door and frame manufacturers with complete instructions and templates for preparation of their work to receive hardware.
- .3 Furnish manufacturers' instructions for proper installation of each hardware component.

3.2 INSTALLATION

- .1 Install hardware to standard hardware location dimensions in accordance with Canadian Metric Guide for Steel Doors and Frames (Modular Construction) prepared by Canadian Steel Door and Frame Manufacturers' Association.
- .2 Where door stop contacts door pulls, mount stop to strike bottom of pull.
- .3 Install key control cabinet.
- .4 Use only manufacturer's supplied fasteners. Failure to comply may void manufacturer's warranties and applicable licensed labels. Use of "quick" type fasteners, unless specifically supplied by manufacturer, is unacceptable.
- .5 Remove construction cores when directed by Departmental Representative; install permanent cores and check operation of locks.

3.3 ADJUSTING

- .1 Adjust door hardware, operators, closures and controls for optimum, smooth operating condition, safety and for weather tight closure.
- .2 Lubricate hardware, operating equipment and other moving parts.
- .3 Adjust door hardware to provide tight fit at contact points with frames.

3.4 CLEANING

- .1 Perform cleaning after installation to remove construction and accumulated environmental dirt.
- .2 Clean hardware with damp rag and approved non-abrasive cleaner, and polish hardware in accordance with manufacture's instructions.
- .3 Remove protective material from hardware items where present.
- .4 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

3.5 DEMONSTRATION

- .1 Maintenance Staff Briefing:
 - .1 Brief maintenance staff regarding:
Proper care, cleaning, and general maintenance of projects complete hardware.
Description, use, handling, and storage of keys.
Use, application and storage of wrenches for door closers, locksets and fire exit hardware.
- .2 Demonstrate operation, operating components, adjustment features, and lubrication requirements.

SCHEDULE

Hardware Set # H-1 - Single Door No. 101.1; Each to have:

3 Hinges Ives 3CB1 114 x 101 NRP - 630
1 Exit Device Von Duprin 98L-NL x 996L-NL-06 - 630AM
1 Rim Cylinder Schlage 20-021 x MK'd - 626
1 Door Closer LCN 4040XP T/J SRI x TB/SN - 689
1 Mounting Plate LCN 4040-18G SRI - 689
1 O/H Door Stop G-J 904S - 630
1 Mounting Bracket MB2 – to suit - 628
1 Threshold Zero #526A x 915 mm - Alum
1 Set Door Seal Zero #318AA x 5155 mm - AN
1 Door Sweep Zero #339AA x 915 mm - AN
1 Door Position Switch Schlage 679-05HM
1 Electric Strike Von Duprin 6300 FSE x 12/24V - 630
1 Power Supply Schlage PS902 x 900-8F x 900-BBK
Card Reader & Controller Kantech – Supplied by Security Section
Wire, Conduit & Connection by Electrical – Division 26

Hardware Set # H-2 - Single Doors No. 101.2, 101.3, 104.1; Each to have:

3 Hinges Ives 3CB1 114 x 101 - 630
1 Mortise Passage Set Schlage L9010-06/A x 10-072 – 630AM

1 Door Closer LCN 4040XP REG SRI x TB/SN - 689
1 Floor Door Stop Ives FS439 - 630
1 Set Door Seal Zero #188S-Bk x 5181 mm - Blk
1 Door Sweep Zero #8192AA x 915 mm - AN

Hardware Set # H-3 - Single Door No. 105.1; Each to have:

3 Hinges Ives 3CB1 114 x 101 - 630
1 Mortise Lockset Schlage L9056P-06/A x MK'd – 630AM
1 Door Closer LCN 4040XP EDA SRI x TB/SN - 689
1 Mounting Bracket MB2 – to suit - 628
1 Floor Door Stop Ives FS439 - 630
1 Threshold Zero #546A x 915 mm - Alum
1 Set Door Seal Zero #770AA x 5181 mm - AN
1 Automatic Door Bottom Zero #367AA x 915 mm - AN
1 Door Sweep Zero #339AA x 915 mm - AN

Hardware Set # H-4 - Single Door No. 105.2; Each to have:

3 Hinges Ives 3CB1 114 x 101 NRP - 630
1 Exit Device Von Duprin 98EO – 630AM
1 Door Closer LCN 4040XP SCUSH SRI x TB/SN - 689
1 Mounting Bracket MB2 – to suit - 628
1 Threshold Zero #526A x 915 mm - Alum
1 Set Door Seal Zero #770AA x 5181 mm - AN
1 Automatic Door Bottom Zero #367AA x 915 mm - AN
1 Door Sweep Zero #339AA x 915 mm - AN

Hardware Set # H-5 - Single Doors No. 106.2, 106.3; Each to have:

3 Hinges Ives 3CB1 114 x 101 - 630
1 Mortise Lockset Schlage L9080P-06/A x MK'd – 630AM
1 Door Closer LCN 4040XP SCUSH SRI x TB/SN - 689
1 Mounting Bracket MB2 – to suit - 628
1 Set Door Seal Zero #318AA x 5181 mm - AN
1 Door Sweep Zero #339AA x 915 mm - AN

Hardware Set # H-6 - Single Door No. 101.1; Each to have:

3 Hinges Ives 3CB1 114 x 101 NRP - 630

1 Mortise Lockset Schlage LV9080P-06/A x MK'd – 630AM
1 Door Closer LCN 4040XP SCUSH SRI x TB/SN - 689
1 Mounting Bracket MB2 – to suit - 628
1 Threshold Zero #526A x 915 mm - Alum
1 Set Door Seal Zero #318AA x 4979 mm - AN
1 Door Sweep Zero #339AA x 915 mm - AN

1 Door Position Switch Schlage 679-05HM
1 Electric Strike Von Duprin 6400 FSE x 12/24V - 630
1 Power Supply Schlage PS902 x 900-8F x 900-BBK
1 Lock Guard Ives LG14 - 630
Card Reader & Controller Kantech – Supplied by Security Section
Wire, Conduit & Connection by Electrical – Division 26

END OF SECTION

Part 1 General

1.1 REFERENCES

- .1 ANSI Z97.1-2009 - Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test.
- .2 ASTM C542-05 - Standard Specification for Lock-Strip Gaskets.
- .3 ASTM C864-05 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
- .4 ASTM C920-11 - Standard Specification for Elastomeric Joint Sealants.
- .5 ASTM C1036-06 - Standard Specification for Flat Glass.
- .6 ASTM C1048-04 - Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass.
- .7 ASTM C1172-09e1 - Standard Specification for Laminated Architectural Flat Glass.
- .8 ASTM C1193-09 - Standard Guide for Use of Joint Sealants.
- .9 ASTM C1503-08 - Standard Specification for Silvered Flat Glass Mirror.
- .10 ASTM D412-06ae2 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
- .11 ASTM D1149-07 - Standard Test Methods for Rubber Deterioration-Cracking in an Ozone Controlled Environment.
- .12 ASTM D2240-05(2010) - Standard Test Method for Rubber Property—Durometer Hardness.
- .13 ASTM E84-10b - Standard Test Method for Surface Burning Characteristics of Building Materials.
- .14 ASTM E283-04 - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .15 ASTM E330-02(2010) - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
- .16 CAN/CGSB 12.1-M90 - Tempered or Laminated Safety Glass.
- .17 CAN/CGSB 12.2-M91 - Flat, Clear Sheet Glass.
- .18 CAN/CGSB 12.3-M91 - Flat, Clear Float Glass.
- .19 CAN/CGSB 12.4-M91 - Heat Absorbing Glass.
- .20 CAN/CGSB 12.8-97 - Insulating Glass Units.
- .21 CAN/CGSB 12.9-M91 - Spandrel Glass.
- .22 CAN/CGSB 12.10-M76 - Glass, Light and Heat Reflecting.
- .23 CAN/CGSB 12.11-M90 - Wired Safety Glass.
- .24 CAN/CGSB 12.13-M91 - Patterned Glass.

- .25 CAN/CGSB 12.20-M89 - Structural Design of Glass for Buildings.
- .26 CGSB 19-GP-5M-84 - Sealing Compound, One Component, Acrylic Base, Solvent Curing.
- .27 IGMAC (Insulating Glass Manufacturers Association of Canada) - IGMAC Certification Program for the CGSB 12.8 standard.
- .28 IGMA (Insulating Glass Manufacturers Alliance).
- .29 LSGA (Laminators Safety Glass Association) Laminated Glass Design Guide 2000.

1.2 PERFORMANCE REQUIREMENTS

- .1 Provide glass and glazing materials for continuity of building enclosure vapour retarder and air barrier:
 - .1 In conjunction with materials described in Section 07 92 00 and 07 27 00.02.
 - .2 To utilize the inner pane of multiple pane sealed units for the continuity of the air barrier and vapour retarder seal.
 - .3 To maintain a continuous air barrier and vapour retarder throughout the glazed assembly from glass pane to heel bead of glazing sealant.
- .2 Size glass to withstand dead loads and positive and negative live loads acting normal to plane of glass as measured to ASTM E330 .

1.3 ADMINISTRATIVE REQUIREMENTS

- .1 Section 01 14 10: Project management and coordination procedures.
- .2 Pre-installation Meetings: Convene one (1) week before starting work of this section.

1.4 SUBMITTALS FOR REVIEW

- .1 Section 01 33 00: Submission procedures.
- .2 Product Data on Glass Types Specified: Provide structural, physical and environmental characteristics, size limitations, special handling or installation requirements.
- .3 Product Data on Glazing Compounds: Provide chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colours.
- .4 Samples: Submit samples (300 x 300 mm) 12 x 12 inch in size, providing an example of coloration.
- .5 Samples: Submit (150 mm) 6 inch long bead of glazing sealant, colour.

1.5 SUBMITTALS FOR INFORMATION

- .1 Section 01 33 00: Submission procedures.

1.6 QUALITY ASSURANCE

- .1 Products of This Section: Manufactured to ISO 9000 certification requirements.
- .2 Perform Work in accordance with GANA Glazing Manual and IGMAC for glazing installation methods.

- .3 Installer Qualifications: Installer specializing in performing the work of this section with minimum five (5) years documented experience and approved by the manufacturer. Contractor to submit names and experience of individuals performing the work of this section.

1.7 MOCK-UP

- .1 Section 01 45 00: Requirements for mock-up assembly.
- .2 Provide mock-up of 10 m² (100 SF) including glass.
- .3 Locate where directed.
- .4 Approved mock-up may remain as part of the Work.

1.8 ENVIRONMENTAL REQUIREMENTS

- .1 Do not install glazing when ambient temperature is less than 5 degrees C.
- .2 Maintain minimum ambient temperature before, during and twenty-four (24) hours after installation of glazing compounds.

1.9 WARRANTY

- .1 Section 01 78 00 Closeout Submittals.
- .2 Provide warranty to include coverage for failure to meet specified requirements.
- .3 Provide an extended warranty to include coverage for sealed glass units from seal failure, inter-pane dusting or misting, and replacement of same.
- .4 Provide an extended warranty to include coverage for delamination of laminated glass and replacement of same.

Part 2 Products

2.1 FLAT GLASS MATERIALS

- .1 Flat Glass (Type FG-A): CAN/CGSB-12.3 M91, Clear, 3mm (1/4 in) thick
- .2 Flat Glass (Type FG-B): CAN/CGSB-12.3 M91, Clear, 6mm (1/4 in) thick.
- .3 Heat Strengthened (Type FG-C): CAN/CGSB-12.1, Clear. Heat Strengthened; 6mm (1/4 in) thick.
- .4 Heat Strengthened (Type FG-D): CAN/CGSB-12.1, Clear. Heat Strengthened; 8mm (5/16 in) thick
- .5 Tempered Glass (Type FG-E): CAN/CGSB-12.1, Clear, Tempered; 3mm (1/8 in) thick.
- .6 Tempered Glass (Type FG-F): CAN/CGSB-12.1, Clear, Tempered; 4mm (3/16 in) thick.
- .7 Tempered Glass (Type FG-G): CAN/CGSB-12.1, Clear, Tempered; 6mm (1/4 in) thick.
- .8 Tempered Glass (Type FG-H): CAN/CGSB-12.1, Clear, Tempered; 8mm (5/16 in) thick.
- .9 Tempered Wired Glass (Type FG-J): CAN/CGSB 12.11, polished both sides (transparent), woven stainless steel wire mesh style rectangular of 13 mm grid size; 6 mm (1/4 in) thick.

2.2 SEALED INSULATED GLASS UNITS

- .1 Type GL-1: Double Glazed Insulating Glass Unit: CAN/CGSB-12.8, double pane; outer pane of Type FG-C/Type FG-G glass, inner pane of Type FG-C/Type FG-G glass; Sun-Guard Silver 20 on No. 2 surface; low-E soft coat on No. 3 surface; 13 mm interpane space filled with argon gas; with closed cell polymer foam warm edge, seal glass with elastomer; total unit thickness of 25 mm. Panes (lites) to be either Heat Strengthened or Tempered as noted on glazing elevation drawings.

2.3 GLAZING COMPOUNDS

- .1 Sealant: in accordance with Section 07 92 00 Joint Sealants.

2.4 GLAZING ACCESSORIES

- .1 Lock Strip Gaskets: ASTM C542, ozone-resistant neoprene compound, with lock-strip (zipper) component that friction-fits into position to retain glass pane/unit, H-shape, tensile strength of (14 MPa) 2000 psi tested to ASTM D412, Durometer hardness of 75 tested to ASTM D2240, sized to accommodate glass thickness.
- .2 Glazing Tape: Preformed butyl compound with integral resilient tube spacing device; 10-15 Shore A durometer hardness tested to ASTM D2240; coiled on release paper; (13 mm) 1/2 inch size; black colour.
- .3 Glazing spline: ASTM C864, Option I, Resilient H-shaped extruded shape to suit glazing channel retaining slot; black colour.
- .4 Smoke Removal Unit Targets: Adhesive targets affixed to glass to identify glass units destined for smoke control.

2.5 SOURCE QUALITY CONTROL AND TESTS

- .1 Section 01 45 00: Provide testing of glass.
- .2 Testing and reporting will be carried out by an independent testing agency selected by the Departmental Representative.
- .3 Coordinate and assist testing agency, and allow access to the Work.

Part 3 Execution

3.1 EXAMINATION

- .1 Section 01 10 10 General Requirements: Verify existing conditions before starting work.
- .2 Verify that openings for glazing are correctly sized and within tolerance.
- .3 Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 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 in accordance with manufacturer's written instructions.

3.3 GLAZING METHODS

- .1 Verify that selected sealants and glazing tapes are compatible.
- .2 Perform glazing as required by frame manufacturer to achieve specified performance criteria.
- .3 Completed exterior glazed assemblies to provide full perimeter air and vapour seal to the glazed frames and be pressure equalized.

3.4 CLEANING

- .1 Section 01 74 11: Cleaning installed work.
- .2 Remove glazing materials from finish surfaces.
- .3 Remove labels after Work is complete.
- .4 Clean glass and adjacent surfaces.

3.5 PROTECTION OF FINISHED WORK

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

END OF SECTION