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**STEEL DOORS AND FRAMES**

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**1. GENERAL**

**1.1 Design Requirements**

- .1 Design frame assembly to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- .2 Maximum deflection for exterior steel entrance screens and transoms under wind load of 1.2 kPa not to exceed 1/175th of span.
- .3 Install work to CSDFMA Installation Guide.

**1.2 Quality Assurance**

- .1 Fabrication: Comply with requirements of Canadian Steel Door and Frame Manufacturers' Association.
- .2 Source Limitations: Obtain doors and frames through one source from a single manufacturer.

**1.3 Requirements of Regulatory Agencies**

- .1 Fire Rated Assemblies: Labelled and listed by a nationally recognized testing agency having factory inspection service in conformance with CAN4 S104M and CAN4 S105M for fire protection ratings indicated.
- .2 Oversize Fire Rated Assemblies: For units exceeding sizes of tested assemblies, provide certification by a testing agency acceptable to authorities having jurisdiction that doors comply with construction requirements for tested and labelled fire protection rated assemblies except for size.
- .3 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.

**1.4 Submittals**

- .1 Shop Drawings: Indicate each type of door and frame, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, arrangement of hardware and fire rating.

**1.5 Delivery, Storage, and Handling**

- .1 Brace and protect doors and frames to prevent distortion during shipment. Store in a secure dry location.
- .2 Store doors vertically, resting on planks, with blocking between to allow air to circulate.

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**2. PRODUCTS**

**2.1 Materials**

- .1 Metallic Coated Sheet Steel: ASTM A568M Class 1 Commercial grade steel, hot-dip galvanized to ASTM A 653/A653M ZF75/A25 zinc coated (Galvanized) or ZF180/A40 zinc-iron alloy-coated (Galvannealed).
- .2 Minimum Core Thickness, Without Coating: Metallic Coated Sheet Steel:
  - .1 Interior Door and Sidelight Frames: 1.519 mm (0.060")
  - .2 Doors and Panels, Hollow Steel Construction
    - .1 Face Sheets: 1.519 mm (0.060")
    - .2 Vertical Stiffeners, 0.912 mm (0.036")
  - .3 Lock and Strike Reinforcements: 2.66 mm (0.1")
  - .4 Hinge and Pivot Reinforcements: 3.416 mm (0.134") thick by 38 mm (1½") wide by 150 mm (6") longer than hinge and pivot, secured by not less than 6 spot welds.
  - .5 Flush Bolt Reinforcement: 2.66 mm (0.1")
  - .6 Surface Applied Hardware Reinforcements: 2.66 mm (0.1")
  - .7 Closer or Holder Reinforcements: 2.66 mm (0.1")
  - .8 Top and Bottom End Channels and Caps: 1.6 mm (0.060")
  - .9 Mortar Guard Boxes: 0.759 mm (0.03")
  - .10 Glass Stops (Screw Fixed or Snap-In Types): 0.912 mm (0.036")
  - .11 Floor Anchors: 1.6 mm (0.060")
  - .12 Jamb Spreaders: 0.912 mm (0.036")
  - .13 Frame Anchors:
    - .1 Masonry T-strap Type: 1.214 mm (0.048")
    - .2 Masonry Stirrup-strap Type: 50 mm x 250 mm x 1.6 mm (2" x 10" x 0.060")
- .3 Adhesives for Steel Components: Heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .4 Touch-up primer: CAN/CGSB-1.181, Zinc rich primer.

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- .5 Door Silencers: single stud rubber/neoprene type.
  - .1 Single Door: Three (3) silencers on strike jamb.
  - .2 Double Door: Two (2) silencers at head of each door leaf.
- .6 Welding: CSA W59-M.
- .7 Filler: Metallic paste, manufacturer's standard.
- .8 Thermal Break: Rigid polyvinylchloride extrusion.

**2.2 Fabrication - General**

- .1 Fabricate work in accordance with CSDFMA specifications.
- .2 Blank, reinforce, drill, and tap units for mortised, templated hardware, and electronic hardware using templates provided by the hardware suppliers. Reinforce units for surface mounted hardware.
- .3 Do welding to CSA W59.
- .4 Apply at factory; touch up primer to doors and frames manufactured from metallic coated steel where coating has been removed during fabrication.
- .5 Make provisions in doors and frames to suit requirements of Section providing security devices.
- .6 Fabricate fire rated assemblies to ULC requirements and bearing ULC, cUL or Warnock-Hersey International Ltd., label, as acceptable to authorities having jurisdiction.
- .7 Locate fire rating labels on the inside of the frame hinge jamb and door hinge edge midway between the top hinge and the head of the door.

**2.3 Fabrication – Frames and Screens**

- .1 Fabricate frames to profiles and maximum face sizes as required to suit design, welded construction.
- .2 Cut mitres and joints accurately and weld continuously on inside of frame profile.
- .3 Grind welded corners and joints to flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .4 Protect mortised cutouts with mortar guard boxes in masonry and concrete constructions. Conceal fastenings except where exposed fastenings are required.

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- .5 Fabricate metal screens to profiles required. Supply jamb and mullion extensions and anchors required to secure screens to the structure or framing provided under other construction. Fabricate anchorage to prevent transfer of load from support framing to the screens when deflection of structure occurs. Provide concealed reinforcement for screens to receive handrails. Provide closely fitted steel glass stops where required. Mitre corners. Drill and countersink fasteners symmetrically at min 150 mm (6") o.c. Screw stops in place.
- .6 Provide jamb anchors for fixing at floor.
- .7 Provide three bumpers on strike jamb for each single door, and two bumpers at head of frame for each door leaf in double doors.

**2.4 Fabrication - Doors**

- .1 Doors General: Fabricate swing type doors, flush, with provision for glass and/or louvre openings as required.
- .2 Fabricate doors with longitudinal edges seamless, continuously welded, filled and sanded flush.
- .3 Hollow Steel Construction: Form each face sheet for exterior and interior doors from sheet steel. Reinforce doors with vertical stiffeners, securely welded or laminated to each face sheet at 150 mm (6") on centre maximum.
- .4 Fabricate doors with top and bottom steel channels full width of door and welded to both faces.

**2.5 Fabrication – Glazing Stops**

- .1 Fixed Glazing Stops: Formed integral with door faces and frames, minimum 16 mm (e") high, unless otherwise indicated.
  - .1 Locate fixed stops on outside of exterior and on secure side of interior doors and frames.
- .2 Loose Glazing Stops: Minimum 0.8 mm (0.032") thick, formed channel, fabricated from same material as frames in which they are installed. Minimum 16 mm (e") high unless otherwise indicated.
  - .1 Locate loose stops on inside of doors and frames.
- .3 Form corners of stops with butted or mitered hairline joints.
- .4 Coordinate rabbet width between fixed and loose stops with type of glazing and type of installation indicated.
- .5 Fasteners: Vandal resistant, countersunk flat or oval head machine screws spaced uniformly not more than 225 mm (9") o.c., and not more than 50 mm (2") from each corner.

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**3. EXECUTION**

**3.1 Installation - General**

- .1 Install fire rated assemblies in accordance with NFPA 80.
- .2 Touch up with primer galvanized finish damaged during installation.

**3.2 Installation - Frames**

- .1 Set frames plumb, square, level and at correct elevation.
- .2 Provide suitable anchors to suit construction. Use one base anchor and two wall anchors per jamb side for frames up to 1500 mm (60") and one additional wall anchor per jamb side for each additional height of 750 mm (30") or fraction thereof.
- .3 Secure anchorages and connections to adjacent construction.
- .4 Brace frames rigidly in position while building-in. Install temporary horizontal wood spreader at third points of door opening to maintain frame width. Remove temporary spreaders after frames are built-in.
- .5 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.

**3.3 Installation - Doors**

- .1 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows:
  - .1 Hinge side: 3 mm (c").
  - .2 Latchside and head: 3 mm (c").
  - .3 Finished floor for non-rated assemblies: 12 mm (1/2"), unless otherwise indicated.
  - .4 Finished floor for rated assemblies: To NFPA 80 requirements.
- .2 Adjust operable parts for correct function.

**3.4 Cleaning**

- .1 Clean and make good all surfaces soiled or otherwise damaged in connection with work. Upon completion of work and remove debris, equipment and excess material from Site.

**END OF SECTION**

## WOOD DOORS

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### 1. GENERAL

#### 1.1 Quality Assurance

- .1 Quality of work and materials: Unless otherwise specified, comply with the requirements for Premium Grade in accordance with the 2005 AWI/AWMAC Architectural Woodwork Quality Standards Illustrated Eighth Edition Version 2 (AWI/AWMAC QSI).
- .2 Source Limitations, Doors: Obtain doors through one source from a single manufacturer.

#### 1.2 Definitions

- .1 Exposed Surfaces: Surfaces visible when doors are opened, backs of hinged doors and edges of hinged doors exposed when opened.

#### 1.3 Submittals

- .1 Door Sample: Submit one 300 x 300 mm (12" x 12") corner sample showing construction, edge details, core and face veneers.
- .2 Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details; location and extent of hardware blocking; and other pertinent data:
  - .1 Dimensions and locations of cutouts, mortises and holes for hardware.
  - .2 Grain pattern and veneer matching.
  - .3 Factory finish requirements.
  - .4 Jointing, fastening and related items.

#### 1.4 Delivery, Storage, and Handling

- .1 Ensure complete protection of edges and finishes during shipment to the Job Site.
- .2 Mark each door on top and bottom rail with opening number used on Shop Drawings.
- .3 Store work in well ventilated room, off floor, in accordance with Manufacturer's Recommendations.

#### 1.5 Project Conditions

- .1 Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

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### 2. PRODUCTS

#### 2.1 Materials

- .1 Wood Veneer for Stained Finishing: AWI/AWMAC QSI Grade A, Birds Eye Maple, plain sliced, equal width, uniform, clean, without open defects, patches, plastic repair, minimum 0.80 mm ( $\frac{1}{32}$ " ) thick after sanding.
  - .1 Match Between Veneer Leaves: Book match.
  - .2 Assembly of Veneer Leaves on Door Faces: Balance match.
- .2 Particleboard: ANSI A208.1, extruded particle board, minimum density of 448 kg/m<sup>3</sup> (28 pcf).
- .3 Crossbanding: Composite or 1.6 mm ( $\frac{1}{16}$ " ) thick hardwood.
- .4 Stiles and Rails: Hardwood or structural composite lumber/hardwood. Stile thickness minimum 38 mm ( $1\frac{1}{2}$ " ) and rail thickness minimum 28 mm (1 c" ).
- .5 Hardware Blocking, Non-Rated Doors: 150 mm (6" ) glued block or structural composite lumber in particleboard core doors as follows:
  - .1 Top rail blocking in doors indicated to have closers.
  - .2 Bottom rail blocking in indicated to have kick or mop plates, and mortised or surface bottom door sweeps.
  - .3 Midrail blocking, in doors indicated to have exit devices.
- .6 Exposed Door Edge: Minimum 6 mm ( $\frac{1}{4}$ " ) hardwood, one piece full length, no joints, species to match wood veneer.
- .7 Resilient Bumpers: Round, black rubber, 3 mm (c" ) thick, adhesive mount.
- .8 Adhesive: Waterproof type, suitable for specific end use.

#### 2.2 Fabrication

- .1 Wood Veneer Doors, Solid Core: Particleboard core, 5 ply construction, full length stiles and rails bonded to core. AWI/AWMAC QSI No. 2 MC edge. Laminate crossbandings to core, stiles and rails. Hot press veneer in accordance with manufacture's instructions.
- .2 Completely seal wood edges and edges of cut-outs in shop using sealers compatible with final Site finish. Apply sealer in accordance with the Manufacturer's printed instructions.
- .3 Bevel edges of single acting doors 3 mm (c" ) on lock side and 1.6 mm ( $\frac{1}{16}$ " ) on hinge side.

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- .4 Undercut doors for carpet in the plant.

### 3. EXECUTION

#### 3.1 Installation

- .1 Install work of this Section plumb, square, true, rigid and secure. Conceal fastenings in the finished work unless otherwise indicated on final reviewed shop drawings and in accordance with Manufacturer's printed instructions.
- .2 Provide even margins between doors and jambs and doors and finished floor as follows:
  - .1 Hinge side: 3 mm (c").
  - .2 Latchside and head: 3 mm (c").
  - .3 Finished floor for non-rated assemblies: 12 mm (½").

#### 3.2 Warranty

- .1 Provide a five (5) year warranty commencing on date of Substantial Performance against defects in the materials and workmanship for wood doors, including but not limited to warping, cupping, twisting, shrinkage, swelling, delaminating and splitting.

**END OF SECTION**



## **DOOR HARDWARE**

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### **1. GENERAL**

#### **1.1 Quality Assurance**

- .1 Furnish services of an Architectural Hardware Consultant (AHC) for preparation of hardware shop drawings, keying, co-ordination with other Sections, consultation with the City and the Contract Administrator and for On-Site inspections.
- .2 Inspect all hardware after installation by the Manufacturer's Representative who shall certify in writing to the City, that all hardware has been supplied and installed in accordance with the specifications and reviewed Shop Drawings, and are functioning properly.
- .3 Hardware for doors in fire separations and exit doors certified by a Canadian Certification Organization accredited by Standards Council of Canada.
- .4 Provide to applicable Sections templates and information required for proper preparation and application of hardware in ample time to facilitate progress of Work.
- .5 Before supplying and installing any hardware, carefully check Hardware Schedule, Drawings and Specifications. Verify door hands, door and frame material and operating conditions, and assure that hardware will fit work to which it is to be attached. Advise Contract Administrator in writing of required revisions.
- .6 Templates: Check Hardware Schedule, Drawings and Specifications, and Supply promptly to applicable Sections any templates, template information and Manufacturer's literature, required for proper preparation for hardware, in ample time to facilitate progress of work.
- .7 Provide services of competent mechanics for the installation of hardware. Make adjustments necessary to leave hardware in perfect working order. Provide written summary of work completed and status of all items, including any adjustments, revisions or modifications.
- .8 Maintenance Seminar: Instruct the City regarding proper care, cleaning and general maintenance.
- .9 Source Limitations: Obtain each type of product from a single Manufacturer.

#### **1.2 Regulatory Requirements**

- .1 Ensure hardware for fire-rated openings complies with requirements of authorities having jurisdiction, with door and frame Manufacturer's tested assemblies, and that hardware items bear labels acceptable to authorities having jurisdiction.

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### 2. PRODUCTS

#### 2.1 Materials

- .1 Type and Design: Matching in all respects to samples of hardware and finishes approved by City. Use one Manufacturer's products for all similar items.
- .2 Metal Finishes: Free from defects, clean and unstained, and of uniform colour.
- .3 Fire Rated Doors: Meeting requirements of ULC as part of fire rated door assembly, with ULC or WHI label, or as acceptable to authority having jurisdiction.
- .4 Fasteners: Screws, bolts, expansion shields and other fastening devices as required for satisfactory installation and operating of hardware.
  - .1 Same finish as hardware to which it is to be fastened.
- .5 Supply hardware complete with all necessary screws, bolts and other fastening of suitable size and type to anchor the hardware in position neatly and properly in accordance with the best practices and to the Contract Administrator's approval.
- .6 Fastenings: All fastenings shall harmonize with the hardware materials and finishes.
- .7 Hardware for fire rated and labelled door and frame assemblies: ULC listed or as accepted by authorities having jurisdiction.
- .8 Following Manufacturer's are acceptable subject to review by the City of samples and list of items proposed.
  - .1 Hinges:
    - .1 All Doors: Full mortised, stainless steel, minimum 114 mm x 102 mm, heavy weight, 5 knuckles, ball bearing, stainless steel screws.
    - .2 Non Removal Pin: Out swinging exterior doors and where scheduled.
    - .3 Stamp hinge catalogue numbers on face of leaf of each hinge at factory to enable easy recognition of hinge material and manufacture after doors are hung.
    - .4 Where doors are required to swing to 180 degrees, Supply and Install hinges of sufficient throw to clear trim.
  - .2 Locksets:
    - .1 Type and Finish: Heavy duty, stainless steel construction, orb handle and raised escutcheon.
    - .2 Backset: 125 mm for exterior doors, 70 mm for interior doors.

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- .3 Cylinders: 6 pin cylinders.
- .4 Strikes: Stainless Steel, ANSI standard size with curved lip strikes for latch bolts and no lip strikes for dead locks. Provide complete with wrought boxes finished to match strike.
- .3 Closers:
  - .1 Hydraulically controlled and full rack and pinion operation, clear anodized aluminium arm and full cover.
  - .2 Adjustable closing speed, latch speed and back check control.
  - .3 Adjustable swing power.
  - .4 Install all necessary attaching brackets, mounting channels, cover plates where necessary for correct application of door closers.
  - .5 Parallel arms at out swinging exterior doors and at interior doors where specified.
  - .6 Delayed action for barrier free application.
  - .7 Coordinate closers with overhead holders.
- .4 Construction Keying:
  - .1 Equip lock cylinders in construction system.
  - .2 The construction key system to be inoperative once the City's keys are inserted in the cylinders.
- .5 Push Plates and Kickplates:
  - .1 Length: 40 mm (1½") less than door width for single doors and 20 mm (¾") less than door width for doors in pairs.
  - .2 Thickness: 1.3 mm (0.050"), free of rough or sharp edges. Corners and edges to be slightly radiused.
  - .3 Installation: 3M tape.
- .6 Surface Bolts:
  - .1 Stainless steel top and bottom bolts, chain pull for top bolt.
  - .2 Dust free strikes.

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- .7 Door Stops:
  - .1 Surface mount, stainless steel retainer, half dome shaped neoprene stop.
  - .2 Install floor stops in manner so as not to create a tripping hazard and allows maximum opening of doors.
  - .3 Supply and Install door stops of height to engage doors.
- .8 Astragals: Stainless steel bar with neoprene bulb.
- .9 Weatherstrippings: Surface mounted extruded aluminium housing with neoprene bulb having spring mounted adjustment, 770A by Zero International.
- .10 Door Bottoms: Surface mounted, extruded aluminium housing, pressure spring loaded neoprene bulb, 365A by Zero International.
- .11 Thresholds: Extruded aluminium, high seat, except flat saddle for barrier free application.

### **2.2 Keying System**

- .1 Lay out keying system for building in consultation with the City. Keying system shall include keying alike, keying differently, keying in groups, master keying and grand-master keying locks and exit devices as required.
- .2 Prepare and submit keying chart and related explanatory data for approval. Do not order cylinders until written confirmation of keying arrangements is received from the City.
- .3 Stamp keys "DO NOT DUPLICATE".
- .4 Provide two (2) change keys for each lock. Three (3) keys for each submaster level and six (6) grand master keys. In the case of keyed alike groups, supply six (6) cut keys only and supply the balance as blanks.
- .5 Supply 1 Key Control System complete with cabinet and necessary components as Lund Model 1201, 2 tag system.
- .6 Confirm with Contractor and the City for shipping directions.

### **3. EXECUTION**

#### **3.1 Preparation**

- .1 Thoroughly check design and provide required hardware for openings to required detail.
- .2 Trim undesignated openings with hardware of equal quality and design to that specified for similar opening.

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- .3 Furnish door and frame Manufacturers with complete instructions and templates for preparation of their Work to receive hardware.

### 3.2 Installation

- .1 Install finish hardware to template in accordance with Manufacturer's written instructions. Do not modify finish hardware without Manufacturer's written approval.
- .2 Install finish hardware for fire rated doors in accordance with NFPA 80 requirements.
- .3 Install finish hardware secure, plumb, level, and true to line.
- .4 Cut and fit to substrates avoiding damage and weakening. Reinforce attachment substrate as necessary for proper installation and operation.
- .5 Size cutouts so that hardware item completely covers cut out.
- .6 Mortise work to correct location and size without gouging, splintering, and causing irregularities in exposed finish work.
- .7 Where cutting and fitting is required on substrates to be painted or similarly finished, install, fit, and adjust hardware prior to finishing.
- .8 Remove hardware and place in original packaging.
- .9 Re-install hardware after finishing operation is complete.
- .10 Install hardware items affixed to concrete and masonry with machine screws and threaded metal expansion shields.
- .11 Set, fit and adjust hardware according to Manufacturer's templates and instructions. Hardware shall operate freely. Protect installed hardware from damage and paint spotting.
- .12 Consult with manufacturer of security hardware items such as door monitoring equipment, card reader access equipment, electric strikes, and electric hinges operated by card access equipment and combination magnetic door holder releases/door closers and install in accordance with Manufacturer's recommendations under the Contractor's supervision Sections Fire Detection and Alarm System. Use templates as supplied by Manufacturer for predrilling doors and frames.
- .13 Pre-drill kickplates and doors before attachment of plates. Apply with water resistant adhesive and countersunk stainless steel screws.
- .14 Weatherstrip exterior doors. Install effectively to tightly seal entire perimeter of door. Secure in place with non-ferrous screws, in accurate alignment.

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- .15 Maintain integrity of weather seal at head of doors fitted with closers. Adapt weatherstripping as required to achieve specified performance and provide any necessary accessories.
- .16 After installation of hardware under this Section, check opening units for correct fit and uniformity of space around perimeter of units, or between units. Provide smoothly operating opening units free from binding.

### **3.3 Field Quality Control**

- .1 Have hardware Manufacturer's Representative visit Site and submit written report of each visit to Site, giving storage conditions and installation details, date and name of hardware Manufacturer's Representative.
- .2 Before completion of Work but after hardware installation, have hardware Manufacturer's Representative inspect work and submit certificate to Contract Administrator stating that final inspection has been made and that hardware of proper type has been properly installed and adjusted, is in good working order and condition, and is in conformance with Contract requirements.

### **3.4 Adjustments and Cleaning**

- .1 Adjust and clean hardware according to Manufacturer's written instructions.
- .2 Turn over construction keys and extractor key to the City and provide any required adjustment or modifications prior to Substantial Performance of the Contract.
- .3 Hand over to the City Grand-master and master keys, Change Keys, Control Keys and Permanent Cylinders and core. The City will be responsible for interchanging temporary construction cores with permanent cylinder cores in locks. Temporary construction cores will be returned to Contractor.

### **3.5 Extended Warranty**

- .1 Warrant work against defects in materials and quality of performance for a period of five (5) years for door closers and two (2) years for other hardware.

**END OF SECTION**

## GLASS AND GLAZING

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### 1. GENERAL

#### 1.1 Quality Control

- .1 Perform work in accordance with recommendations of Glazing Association of North America (GANA). Size glass to Code requirements and verify that openings for glazing are correctly sized and within tolerance.
- .2 Glass Lites: Float, tempered, or heat strengthened and in thicknesses in accordance with requirements of glass manufacturer as substantiated by the glass manufacturer's stress analysis for each location required, unless otherwise indicated.
- .3 Use a safety factor of 2.5:1 minimum for glass design.

#### 1.2 Environmental Requirements

- .1 Install glazing when ambient temperature is 10°C minimum. Maintain ventilated environment for twenty four (24) hours after application.
- .2 Maintain minimum ambient temperature before, during and twenty four (24) hours after installation of glazing compounds.

### 2. PRODUCTS

#### 2.1 Materials

- .1 Float Glass: CAN/CGSB-12.3, clear, glazing quality, minimum 6 mm (¼") thick.
- .2 Tempered Safety Glass: CAN/CGSB-12.1 Type 2, Class B, minimum 6 mm (¼") thick, heat treated using the horizontal tong free method, with roll-wave distortion parallel to bottom edge of glass as installed.
- .3 Heat Strengthened Glass: ASTM C1048 Type HS, minimum 6 mm (¼") thick, heat treated using the horizontal tong free method, with roll-wave distortion parallel to bottom edge of glass as installed.
- .4 Wired Glass: Clear, 6 mm (¼") thick, polished Georgian 12 mm (½") square wire-reinforced, float glass, having the required fire resistance rating based on ULC testing.

#### 2.2 Mirror Materials

- .1 Mirrors: CAN/CGSB-12.5, Type 1A, polished and coated float glass, minimum 5 mm thick, mirror back coated with epoxy paint.
- .2 Mirror Backpaint, Sealer and Adhesive - basis of design products: Products specified are products by Palmer Products Corporation. Products by other manufacturers similar in

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function, design, performance, and construction complying with requirements of this Section may be incorporated into the Work subject to Contractor Administrator's acceptance.

- .1 Backpaint: Mirro-Bac Paint.
- .2 Sealer: Mirro-Mastic Bond.
- .3 Adhesive: Mirro-Mastic.

### 2.3 Accessories

- .1 Glazing materials, primers and cleaning solvents: Mutually compatible, standard colours.
- .2 Glazing Compound: CAN2-19.13, one component silicone base.
- .3 Glazing Tape: Extruded, ribbon-shaped, non-drying, non-skinning, non-oxidizing, reinforced, polyisobutylene tape of sufficient width and thickness, 6 mm (1/4") minimum, to permit a continuous seal.
- .4 Shims, Spacers and Setting Blocks: 45, 50 and 90 Durometer A hardness  $\pm 5$  respectively, neoprene rubber. Resistance to sunlight, weathering, oxidation and permanent deformation under load shall be prime essentials of shims, spacers and setting blocks.
- .5 Glazing Gaskets: Neoprene, EPDM, thermoplastic or other approved material, of sufficient thickness to be 25% compressed when installed. Gaskets shall have a 13.8 MPa (2000 psi) tensile strength, Durometer A hardness of 50,  $\pm 5$ , resistance to permanent set 30% maximum, minimum elongation at break of 300% and resistance to ozone showing no cracks.

### 2.4 Fabrication

- .1 Accurately size glass to fit openings allowing clearances recommended by Glass Association of North America. Cut glass clean and free of nicks and damaged edges. Grind smooth and polish exposed glass edges. Do not cut or abrade tempered, heat treated, or coated glass.
- .2 Mirrors: Polished flat edges, regardless of mounting methods.
- .3 Glass shelf: Grind arris to edges which will be unexposed in the finished work. Flat polish glass shelf edges which will be exposed in the finished work.

## 3. EXECUTION

### 3.1 Inspection

- .1 Verify dimensions at the site before proceeding with fabrication or glazing units.
- .2 Ensure that openings are free from distortion, and that surfaces are free from protrusions that will obstruct face and edge clearances.



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- .3 Ensure that wood is sealed; ferrous metals are painted or zinc coated; and that surfaces are suitable for adhesion of the glazing materials.
- .4 Ensure that operable units to be glazed are adjusted for proper operation.
- .5 Ensure that surfaces to receive mirrors are sealed.
- .6 Ensure that ambient and surface temperatures are above 5°C.

### 3.2 Preparation

- .1 Free rabbets, stops and glass edges of dust, dirt, moisture, oil and other foreign matter detrimental to or obstructing the glazing material.

### 3.3 Installation - General

- .1 Handle and install glass in accordance with Manufacturer's directions. Prevent nicks, abrasions and other damage likely to develop stress on edges.
- .2 Without limitations, cracked or scratched glass, shrinking, cracking, staining, hardening, sagging of glazing materials; loosening or rattling of glass; leaking of glazed joints will be rejected.
- .3 Remove and replace glazing stops in original locations, using original fasteners, securely set and undamaged.
- .4 Use setting blocks and spacers as required to properly support the glass, centred in place in the glazing space independent of the materials and to uniformly distribute its load.
- .5 Use a minimum of 2 setting blocks, located at the quarter points. Locate spacers at jamb edges of glass, uniformly spaced at 600 mm (24") o.c. maximum, and 300 mm (12") maximum from top and bottom.
- .6 Set glass properly centred with uniform bite and face and edge clearance, free from twist, warp or other distortion likely to develop stress.
- .7 Leave labels on glass until it has been set and inspected and approved. Leave glass whole and without cracks, scratches or other defects and with setting in perfect condition at completion, to the approval of the Contract Administrator.
- .8 Remove rejected, broken or damaged glass due to defective materials or improper setting and replace with perfect materials. Units producing distorted vision will be rejected and replaced at the reasonable discretion of the Contract Administrator.

### 3.4 Interior Glazing

- .1 Set glazing in fire rated assemblies in accordance with NFPA 80 and the Code requirements. Install glazing to ULC tested proprietary methods of installation.

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- .2 Unless otherwise specified, all interior glazing shall be dry glazed.
- .3 Provide glazing gasket around entire perimeter of glass. Make tight butt joint at corners of lights. Place setting blocks at sill and spacers at both jambs as required to centre the unit in the frame. Place the unit into the frames and apply the stops against the gaskets. Tighten the screws or clips to obtain positive uniform pressure avoiding excessive pressure.
- .4 Ensure rattle-free cushioning.

### **3.5 Installation - Mirrors, Adhesive Method**

- .1 Backpaint mirrors and apply full coat of sealer to substrates prior to installation, in accordance with manufacturer's recommendations.
- .2 Install mirrors using dollops of mirror adhesive at spacing recommended by the manufacturer of the mirror adhesive for 60% coverage. Brace mirrors in place until adhesive has set. Locate joints as shown.

### **3.6 Cleaning**

- .1 Clean and make good to the approval of the Contract Administrator, surfaces soiled or otherwise damaged in connection with the work of this Section. Pay the cost of replacing finishes or materials that cannot be satisfactorily cleaned.
- .2 Upon completion of the work, remove all debris, equipment and excess material resulting from the work of this Section from the site.

### **3.7 Warranty**

- .1 Warrant mirrors against defects in materials and workmanship for a period of five (5) years against silver deterioration and for a period of two (2) years against loosening the metal frames or fastening, and against cracking of the mirrors.

**END OF SECTION**