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**Partie 1        General**

**1.1            RELATED REQUIREMENTS**

- .1        Section 04 22 00 – Concrete Unit Masonry.
- .2        Section 08 14 16 – Flush Wood Doors.
- .3        Section 08 71 00 – Door Hardware.
- .4        Section 08 80 50 – Glazing.
- .5        Section 08 90 00 – Louvres and Vents.
- .6        Section 09 21 16 – Gypsum Board Assemblies.
- .7        Section 09 22 16 – Non-structural Metal Framing.
- .8        Section 09 91 13 – Exterior Painting.
- .9        Section 09 91 23 – Interior Painting.

**1.2            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)/CSA International
  - .1        CSA-G40.20-F04/G40.21-F04, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2        CSA W59-F03, 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 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-S704-01, Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
  - .4 CAN4-S104-M80, Standard Method for Fire Tests of Door Assemblies.
  - .5 CAN4-S105M-M85, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

### 1.3 SYSTEM DESCRIPTION

- .1 Design Requirements
  - .1 Design exterior frame assembly to accommodate to expansion and contraction when subjected to minimum and maximum surface temperature of -35 degrees C to 35 degrees C.
  - .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.
  - .3 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.
  - .4 Provide fire labelled frames for openings requiring fire protection ratings. Test products in conformance with CAN4-S104, ASTM E152, NFPA 252 and listed by nationally recognized agency having factory inspection services.

### 1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide product data: in accordance with Section 01 33 00 - Submittal Procedures.
- .3 Provide shop drawings: in accordance with Section 01 33 00 - Submittal Procedures.
  - .1 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed and louvred openings, arrangement of hardware, fire rating and finishes.
  - .2 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings, reinforcing, fire rating and finishes.
  - .3 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
  - .4 Submit test and engineering data, and installation instructions.
- .4 Provide samples in accordance with Section 01 33 00 - Submittal Procedures.

- .5 Submit one 300 x 300 mm corner sample of each type of frame.
- .1 Submit one sample with hinge and beads.

## **1.5 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements.
- .2 Waste Management and Disposal:
  - .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

## **1.6 ACCEPTABLE PRODUCTS AND MATERIALS**

- .1 Where a particular brand name is stipulated, see Instructions to Bidders for procedure for requesting approval of substitute materials and products

## **Partie 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 and following indications.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ZF75 for interior doors and frames and ZF75 for exterior doors and frames to ASTM A653M.

### **2.2 DOOR CORE MATERIALS**

- .1 Door types: Honeycomb and stiffened. Stiffened doors are required for exterior doors.
- .2 Honeycomb construction:
  - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m<sup>3</sup> minimum sanded to required thickness.
- .3 Stiffened construction: laminated insulated core.
  - .1 Stiffened exterior doors: rigid, modified poly/isocyanurate panels closed cell board. Density 32 kg/m<sup>3</sup>.
- .4 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E152 and NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

### **2.3 ADHESIVES**

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

- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

## **2.4 PRIMER**

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

## **2.5 PAINT**

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

## **2.6 ACCESSORIES**

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Profils de fermeture horizontaux extérieurs et intérieurs, partie supérieure et partie inférieure : en acier.
- .3 Make provisions for glazing as indicated and provide necessary glazing stops.
  - .1 Provide bare metal beads 16 mm high x 1.22 mm thick, tightly adjusted angles and attached to frame with sheet metal countersunk screws.
  - .2 Design exterior glazing stops to be tamperproof.
  - .3 Glazing: to Section 08 80 50 – Windows.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.

## **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: 1.6 mm welded, thermally broken type construction.
- .4 Interior frames: 1.6mm welded.
- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, 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.

## **2.8 FRAME ANCHORAGE**

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
- .3 Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150 mm from top and bottom of each jambs and intermediate at 660 mm on centre 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 FRAMES: KNOCKED-DOWN TYPE**

- .1 Ship knocked-down type frames unassembled.
- .2 Provide frames with mechanical joints which inter-lock securely and provide functionally satisfactory performance when assembled and installed in accordance with CSDMA Recommended Installation Guide for Steel Doors and Frames.
- .3 Securely attach floor anchors to inside of each jamb profile.

## **2.11 DOOR FABRICATION GENERAL**

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior steel doors: stiffened, insulated. Interior honeycomb/stiffened doors as indicated.
- .3 Fabricate doors with longitudinal edges locked seamed, adhesive assisted. Le joint longitudinal peut être visible mais ne doit pas dépasser 1.6 mm de largeur qui doit être uniforme.

- .4 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.
- .5 Blank, reinforce, drill doors and tap for mortised, templated hardware electronic hardware.
- .6 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .7 Reinforce doors where required, for surface mounted hardware. Provide flush PVC top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .8 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .9 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in conformance with CAN4-S104, ASTM E152 and NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.
- .10 Manufacturer's nameplates on doors are not permitted.

## **2.12 DOORS: HONEYCOMB CORE CONSTRUCTION**

- .1 Form face sheets for exterior doors from 1.0 mm sheet steel with honeycomb core laminated under pressure to face sheets.
- .2 Form face sheets for interior doors with honeycomb core laminated under pressure to face sheets.

## **2.13 STIFFENED DOORS (HOLLOW STEEL)**

- .1 Exterior doors: reinforced core, as indicated.
- .2 Stiffened doors: steel sheet 1.2 mm thick.
- .3 Doors equipped with vertical stiffeners, securely laminated to face sheets at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with polyurethane core.
- .5 Fill voids between stiffeners of interior doors with fibreglass.

## **2.14 THERMALLY BROKEN DOORS AND FRAMES**

- .1 Fabricate thermally broken doors by using insulated core and separating exterior parts from interior parts with continuous interlocking thermal break.
- .2 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.
- .4 Apply insulation.

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**Partie 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.

**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 and thresholds as follows:
  - .1      Hinge side: 1.0 mm.
  - .2      Latchside and head: 1.5 mm.
  - .3      Finished floor: 13 mm.
- .3      Adjust operable parts for correct function.

**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 in accordance with Section 08 80 50 - Glazing.

**END OF SECTION**