

**Part 1 General****1.1 RELATED SECTIONS**

- .1 Division 01-General Requirements.
- .2 Section 07 92 00 - Joint Sealants: Caulking of joints between frames and other building components.
- .3 Section 08 71 00 - Door Hardware - General: Supply of finish hardware, including weather-stripping and mounting heights.
- .4 Section 09 91 13 - Exterior Painting.
- .5 Section 09 91 23 - Interior Painting.
- .6 Division 23 - Louvres and Vents: Door louvres.
- .7 Division 26 - Wiring for Electronic Hardware.

**1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM International)
  - .1 ASTM A653/A653M-11, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  - .2 ASTM B29-03(2009), Specification for Refined Lead.
  - .3 ASTM B749-03(2009), 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/G40.21-04(2009), General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
  - .2 CSA W59-03(R2008), Welded Steel Construction (Metal Arc Welding) (Metric Version).
- .4 Canadian Steel Door Manufacturers' Association, (CSDMA).
  - .1 CSDMA, Specifications for Commercial Steel Doors and Frames, 1990.
  - .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .5 National Fire Protection Association (NFPA)
  - .1 NFPA 80-2010, Standard for Fire Doors and Fire Windows.
  - .2 NFPA 252-2007, Standard Methods of Fire Tests of Door Assemblies.

- .6 Underwriters' Laboratories of Canada (ULC)
  - .1 CAN4-S104-80(R1985), Fire Tests of Door Assemblies.
  - .2 CAN4-S105-09, Fire Door Frames Meeting the Performance Required by CAN4-S104.
  - .3 CAN/ULC-S701-11, Thermal Insulation, Polystyrene, Boards and Pipe Covering.
  - .4 CAN/ULC-S704-11, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

### **1.3 DESIGN REQUIREMENTS**

- .1 Design exterior frame assembly to accommodate to 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 under wind load of 1.2kPa not to exceed 1/175th of span.

### **1.4 SHOP DRAWINGS**

- .1 Submit shop drawings in accordance with Section 01 00 10 – General Instructions.
- .2 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.
- .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and firerating finishes.
- .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and door schedule.
- .5 Submit test ,technical data, and installation instructions to Departmental Representative..

### **1.5 SAMPLES**

- .1 Submit samples in accordance with Section 01 00 10 – General Instructions.
- .2 Submit one 300 x 300mm top corner sample of each type door.
- .3 Submit one 300 x 300mm corner sample of each type of frame.
  - .1 Show butt cut-out, glazing stops and snap-on trim with clips.

### **1.6 REQUIREMENTS**

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN4-S104M, NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E152 or

NFPA 252 and list by nationally recognized agency having factory inspection service and construct as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by listing agency to individual manufacturers.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Separate and recycle waste materials in accordance with Section 01 00 10 – General Instructions.
- .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 in appropriate on-site for recycling in accordance with Waste Management Plan.
- .4 Divert unused paint and sealant materials from landfill to official hazardous material collections site approved by Departmental Representative.
- .5 Do not dispose of unused paint and sealant materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.
- .6 Divert unused metal materials from landfill to metal recycling facility approved by Departmental Representative.
- .7 Divert unused wood materials from landfill to facility approved by Departmental Representative.
- .8 Damaged or broken glazing materials are not recyclable. These materials must not be disposed of with materials destined for recycling.

## **Part 2 Products**

### **2.1 MATERIALS**

- .1 Hot dipped galvanized steel sheet: to ASTM A653M, ZF75, minimum base steel thickness 1.5mm (16gauge) unless door is a special rated door for security. Use Z275 (G90) galvanized material on all exterior doors and frames.
- .2 Reinforcement channel: to CSA G40.20/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.

### **2.2 DOOR CORE MATERIALS**

- .1 Honeycomb construction:
  - .1 Structural small cell, 24.5mm maximum kraft paper 'honeycomb', weight: 36.3kg per ream minimum, density: 16.5kg/m<sup>3</sup> minimum sanded to required thickness.
- .2 Stiffened: face sheets insulated core.
  - .1 Polystyrene: to CAN/ULC-S704 rigid, poly, closed cell board. Density 32kg/m<sup>3</sup>.

- .3 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.

### **2.3 ADHESIVES**

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .2 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 shall be free of scratches or other blemishes.

### **2.6 ACCESSORIES**

- .1 Door silencers: single stub rubber/neoprene type.
- .2 Exterior top caps: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .3 Fabricate glazing stops as formed channel, minimum 16mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.
- .6 Sealant: As directed by manufacturer.
- .7 Glazing: as indicated on drawings.
  - .1 Design exterior glazing stops to be tamperproof and to be located on secure side of door.

### **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: 2mm (14 gauge) insulated pressed steel type construction c/w spray polyurethane insulation infill.
- .4 Interior frames: 2mm (14gauge) welded type construction.

- .5 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier. Reinforce frames for surface mounted hardware.
- .6 Protect mortised cut-outs 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 low expansion spray 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 1520mm and 1 additional anchor for each additional 760mm of height or fraction thereof.
- .4 Locate anchors for frames in existing openings not more than 150mm from top and bottom of each jambs and intermediate at 660mm 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.
- .7 Fabricate frame products for openings as indicated on drawings.

## **2.10 DOOR FABRICATION GENERAL**

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: Insulated: Polystyrene core

- .3 Interior doors: as indicated on drawings . Hollow metal doors- welded steel stiffened construction.
- .4 Fabricate all doors with longitudinal edges continuously welded. 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 12.7mm 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 PVC top caps to exterior doors. Provide Steel caps in fire rated 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 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. Door and Frame is complete with required ULC listing and label affixed to the door and frame.
- .11 Manufacturer's nameplates on doors are not permitted.

## **2.11 HOLLOW STEEL CONSTRUCTION**

- .1 Form each face sheet for exterior doors from 1.5mm (16 gauge) sheet steel.
- .2 Form each face sheet for interior doors from 1.5mm (16 gauge) sheet steel.
- .3 Reinforce doors with 20 gauge minimum vertical stiffeners, securely welded to each face sheet at 150mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with polystyrene core.
- .5 Fill voids between stiffeners of interior doors with core construction as required by door standards, refer to room data sheets.

## **2.12 THERMALLY BROKEN FRAMES**

- .1 Thermal break: rigid polyvinylchloride extrusion conforming to CGSB 41-GP-19Ma.
- .2 Where Fire Rated Frames required: Fire rated frames is the requirement. (thermally broken frames are not available on fire rated frames). Insulate cavity of Frame consistent with exterior wall construction.
- .3 Fabricate thermally broken frames separating exterior parts from interior parts with continuous interlocking thermal break.

- .4 Apply insulation.

### **Part 3 Execution**

#### **3.1 INSTALLATION GENERAL**

- .1 Install labelled steel fire rated doors and frames to NFPA 80 except where specified otherwise.
- .2 Install doors and frames to CSDMA Installation Guide.

#### **3.2 FRAME INSTALLATION**

- .1 Set frames plumb, square, level and at correct elevation. Remove welded metal spreaders on frames prior to setting in place.
- .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 1200mm 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 Tie Air Barrier and Vapour Barrier into frame, continuity of air barrier and vapour barrier to be maintained.
- .7 Insulate door frame with low expansion spray polyurethane insulation full width of frame.

#### **3.3 DOOR INSTALLATION**

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 10 - Door Hardware - General.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
  - .1 Hinge side: 3.0mm maximum.
  - .2 Latch side and head: 3.0 mm maximum.
  - .3 Header: 3.0mm maximum
  - .4 Finished floor, top of carpet and thresholds: 13mm-19mm maximum.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

**3.4 GLAZING**

- .1 Install glazing for doors and frames in accordance with Section 08 80 50 - Glazing.
- .2 Doors in fire rated partitions complete with Glazing- the glazing is to be Georgian wired glass and the door is so designed to maintain fire protection rating. Door and Frame is complete with required ULC listing and label affixed to the door and frame.

**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.

**END OF SECTION**