

## **Part 1 General**

### **1.1 RELATED SECTIONS**

- .1 Section 07 92 00 – Joint Sealants.
- .2 Section 09 22 16 – Non-Structural Metal Framing.
- .3 Section 09 29 00 – Gypsum Board.
- .4 Section 09 90 00 – Painting and Coating.

### **1.2 REFERENCES**

- .1 American Society for Testing and Materials (ASTM).
  - .1 ASTM A653/A653M-10, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.
  - .2 ASTM D2240-05(2010), Standard Test Method for Rubber Property - Durometer Hardness.
- .2 Canadian Standards Association (CSA).
  - .1 CSA G40.20-04/G40.21-04 (R2009), General Requirements for Rolled or Welded Structural Quality Steel/ Structural Quality Steel.
  - .2 CSA W59-03 (R2008), Welded Steel Construction (Metal Arc Welding).
- .3 Canadian General Standards Board (CGSB).
  - .1 CAN/CGSB-1.181-99, Ready-Mixed Organic Zinc-Rich Coating.
  - .2 CAN/CGSB-12.11-M90, Wired Safety Glass.
- .4 Canadian Steel Door Manufacturers Association (CSDMA).
  - .1 CSDMA, Recommended Specifications for Commercial Steel Doors and Frame Products, 2006.
  - .2 CSDMA, Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2000.
  - .3 CSDMA, Canadian Fire Labeling Guide for Commercial Steel Doors and Frame Products, 2009.
- .5 Underwriters' Laboratories of Canada (ULC).
  - .1 CAN/ULC-S104-10, Standard Method for Fire Tests of Door Assemblies.
  - .2 CAN/ULC-S105-09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC-S104.
- .6 National Fire Protection Association (NFPA).
  - .1 NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2010 Edition.
  - .2 NFPA 252, Standard Methods of Fire Tests of Door Assemblies, 2008 Edition

### **1.3 SUBMITTALS**

- .1 Shop Drawings.
  - .1 Submit shop drawings in accordance with Section 01 33 00.
  - .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, arrangement of hardware, fire ratings, and finishes.
  - .3 Indicate each type frame material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and finishes.
  - .4 Include schedule identifying each unit, with door marks and numbers relating to numbering on drawings and in door schedule.

### **1.4 QUALITY ASSURANCE**

- .1 Regulatory Requirements.
  - .1 Steel fire rated doors and frames to be labeled and listed by organization accredited by Standards Council of Canada in conformance with CAN4 S104, CAN/ULC S105, NFPA 80 and NFPA 252 for ratings specified or indicated.
  - .2 Provide fire labeled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4 S104 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.

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

- .1 Deliver all material to site in manufacturer's original unopened packaging with labels clearly identifying product name and manufacturer.
- .2 Store materials in a dry, well ventilated area protected from exposure to moisture, construction activity, and direct sunlight in strict accordance with manufacturer's recommendations.
- .3 Protect by suitable means until installation. Brace and stack to prevent racking, bending, twisting and other damage.
- .4 Handle all products with appropriate precautions and care as stated manufacturer's instructions.
- .5 Cleaning and Waste Management in accordance with Section 01 74 00.

## Part 2 Products

### 2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A653/A653M, ZF75, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CSA G40.20-04/G40.21, Type 44W, coating designation to ASTM A653M, ZF75.
- .3 Door Core Materials.
  - .1 Honeycomb Core: 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.
  - .2 Temperature Rise Rated (TRR): core composition to limit temperature rise on unexposed side of door to 250 degrees C at rating(s) indicated in Door Schedule. Core to be tested as part of complete door assembly, in accordance with CAN4 S104 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.
- .4 Adhesives.
  - .1 Honeycomb Core and Steel Components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .5 Wired Glass (WG): to CAN/CGSB-12.11, Type 1 (polished both sides - transparent), wire mesh style 3 (square), 6 mm thick.
- .6 Glazing Stops: fabricate as formed channel, 0.9 mm (20 gauge) base steel thickness, minimum 16 mm height typical, accurately fitted, butted at corners and fastened with counter-sunk oval head sheet metal screws (secured from room side and not corridor or public side).
- .7 Frame Floor Anchors and Channel Spreaders: 1.6 mm (16 gauge) base steel thickness.
- .8 Guard Boxes: 0.8 mm (22 gauge) base steel thickness.
- .9 Hinge Reinforcing: 4.4 mm (7 ga.) base steel thickness.
- .10 Lock Reinforcing: 1.6 mm (16 ga.) base steel thickness.
- .11 Strike Reinforcing: 2.6 mm (12 ga.) base steel thickness.
- .12 Surface Applied Hardware Reinforcing: 2.6 mm (12 ga.) base steel thickness.
- .13 Fasteners: expansion bolts to ASTM A307, galvanized.
- .14 Astragals: 2.1 mm (14 ga.) base steel thickness.

- .15 Metallic Paste Filler: to manufacturer's standard.
- .16 Primer: touch-up primer to CAN/CGSB-1.181.
- .17 Door Bumpers: single stud black rubber/neoprene type.
- .18 Joint Sealants: in accordance with Section 07 92 00.

## **2.2 ACCESSORIES**

- .1 Glazing Gasket: elastomeric of durometer compatible with glazing tape.
- .2 Setting Blocks: neoprene, 80 - 90 Shore "A" durometer hardness to ASTM D2240, minimum 100 mm x width of glazing rabbet space minus 1.5 mm x height to suit glazing method, glass light weight and area.
- .3 Spacer Shims: neoprene, 50 - 60 Shore "A" durometer hardness to ASTM D2240, 75 mm long x one half height of glazing stop x thickness to suit application. Self-adhesive on one face.
- .4 Primer-Sealers and Cleaners: to glass manufacturer's standard.

## **2.3 FABRICATION**

- .1 General.
  - .1 Fabricate steel doors and frames to Canadian Steel Door Manufacturers Association, (CSDMA) specifications.
  - .2 Fabricate doors and frames to profiles and maximum face sizes as indicated, approved shop drawings and ULC or WHI requirements as applicable.
  - .3 Make provision for glazing on doors and frames as indicated and provide necessary glazing stops.
  - .4 Build-in required hardware reinforcing and guard boxes.
  - .5 Attach ULC or WHI labels to required fire rated doors and frames as indicated.
  - .6 Welded Seam Seamless Edge: lockseam door which has the lockseam tackwelded every 150 mm long the full height of the door. These welds are then ground smooth and the seam is filled and finished to provide a seamless edge.
- .2 Hollow Metal (HM) Door Fabrication.
  - .1 Doors: swing type, flush, with provision for glazed openings as indicated.
  - .2 Form each face sheet from 1.2 mm (18 gauge) sheet steel with honeycomb core laminated under pressure to face sheets, welded seam seamless edge.
  - .3 Bevel hinge and lock door edges 3 mm in 50 mm. Square edges on hinge and/or lock stiles are not acceptable
  - .4 Provide inverted recessed spot welded channels to top and bottom of doors.
  - .5 Reinforce doors where required, for surface mounted hardware.
  - .6 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.

- .7 Reinforce perimeter of glazing openings exceeding 800 mm with minimum 0.8 mm (22 gauge) channels spot welded to door face skins all four sides.
  - .8 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
  - .9 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
  - .10 Construct matching transoms/panels in same manner as doors.
  - .11 Provide astragal to paired doors where required.
  - .12 Manufacturer's nameplates on doors are not permitted.
- .3 Hollow Metal (HM) Welded Frame Fabrication.
- .1 Fabricate welded-frames from 1.6 mm (16 gauge) base steel thickness, welded type construction. 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. Grind welded joints and corners to flat plane, fill with metallic paste and sand to uniform smooth finish.
  - .4 Grind welded joints and corners to 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 Reinforce head of frames wider than 1200 mm.
  - .8 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.
  - .9 Protect strike and hinge reinforcements using steel guard boxes welded to frames.
  - .10 Prepare frame for door silencers, 3 for single door, 2 at head for double door.
  - .11 Conceal fastenings except where exposed fastenings are indicated.
  - .12 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
  - .13 Manufacturer's nameplates on frames are not permitted.

### **Part 3 Execution**

#### **3.1 INSTALLATION**

- .1 General.
  - .1 Install labeled steel fire rated doors and frames to NFPA 80 and NFPA 252 except where specified otherwise.
  - .2 Install doors and frames to CSDMA Installation Guide.

- .2 Frame Installation.
  - .1 Set frames plumb, square, level and at correct elevation to CSDMA Installation Guide.
  - .2 Frame Anchorage.
    - .1 Provide appropriate anchorages and connections to adjacent 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 1525 mm and 1 additional anchor for each additional 760 mm of height or fraction thereof.
  - .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 Install neoprene door bumpers in frames (following field painting of frames).
- .3 Door Installation.
  - .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00.
  - .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 and thresholds: 13 mm.
  - .3 Adjust operable parts for correct function.
- .4 Field Repairs.
  - .1 Touch up finishes damaged during installation with primer.
  - .2 Fill surfaces with imperfections with metallic paste filler and sand to uniform smooth finish.
- .5 Glazing.
  - .1 Install glazing for doors and frames using interior dry method (tape and tape).
  - .2 Cut glazing tape to length and set against permanent stop, projecting 1.6 mm above sight line.
  - .3 Place setting blocks as per manufacturer's instructions.
  - .4 Resting glazing on setting blocks and push against tape for full contact at perimeter of light or unit.
  - .5 Place glazing tape on free perimeter of glazing in same manner as noted above.
  - .6 Install removable stop without displacement of tape. Exert pressure on tape for full continuous contact. Knife trim protruding tape. Do not cut or abrade tempered glass.

END OF SECTION