

**Part 1 General**

**1.1 RELATED DOCUMENTS**

- .1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

**1.2 SUMMARY OF WORK**

- .1 Work Included: The work of this Section includes the provision of all labour, materials, equipment and services required to fabricate and install hollow steel doors and frames, as indicated on the drawings, as specified herein and as required for a complete project.
- .2 Related Sections:
  - .1 Section 05 41 00 - Structural Metal Stud Systems.
  - .2 Section 07 21 20 - Urethane Foam Insulating Sealant.
  - .3 Section 07 27 16 - Vapour Permeable Air/Moisture Barrier.
  - .4 Section 07 92 00 - Joint Sealants.
  - .5 Section 08 71 10 - Door Hardware.
  - .6 Section 08 80 00 - Glazing.
  - .7 Section 09 21 16 - Gypsum Board Assemblies.
  - .8 Section 09 22 16 - Non-Structural Metal Stud Systems.
  - .9 Section 09 91 00 - Painting.

**1.3 REFERENCES**

- .1 American Society for Testing and Materials (ASTM):
  - .1 ASTM A653/A653M-17, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
- .2 Canadian General Standards Board (CGSB):
  - .1 CGSB-41-GP-19Ma-84, Rigid Vinyl Extrusions for Windows and Doors.
- .3 Canadian Standards Association (CSA):
  - .1 CSA-W59-13, Welded Steel Construction (Metal Arc Welding).
- .4 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA):
  - .1 CSDFMA Specifications for Commercial Steel Doors and Frames.
- .5 Door and Hardware Institute (DHI):
  - .1 ANSI/DHI A115 IG-1994, Installation Guide for Doors and Hardware.
- .6 Master Painters Institute (MPI):
  - .1 MPI Architectural Specification Manual, 2014 (referred to herein as "MPI Manual")
  - .2 MPI Approved Product List, (referred to herein as "MPI APL").

- .7 National Fire Protection Association (NFPA):
  - .1 NFPA 80-2016, Standard for Fire Doors and Other Opening Protectives.
  - .2 NFPA 252-2017, Standard Methods of Fire Tests of Door Assemblies.
- .8 Underwriters' Laboratories of Canada (ULC):
  - .1 CAN/ULC-S104-15, Standard Method for Fire Tests of Door Assemblies.
  - .2 CAN/ULC-S105-16, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.
  - .3 CAN/ULC-702.1:2014-AMD1, Standard for Mineral Fibre Thermal Insulation for Buildings, Part 1: Material Specification.
  - .4 CAN/ULC-S702.2-15, Mineral Fibre Insulation for Buildings, Part 2: Application Guidelines.
- .9 Warnock Hersey (WH).

#### **1.4 REQUIREMENTS OF REGULATORY AGENCIES**

- .1 Steel fire rated doors and frames: labelled and listed by an organization accredited by Standards Council of Canada in conformance with CAN/ULC-S104 and CAN/ULC-S105 for ratings specified or indicated.
- .2 The work of this Section shall conform to OBC requirements, NFPA 80, and all other applicable codes and regulations, to the satisfaction of the authorities having jurisdiction.

#### **1.5 SUBMITTALS**

- .1 General: Submit each item in this Article according to the Conditions of the Contract and the applicable Division 01 Specification Sections.
- .2 Shop Drawings:
  - .1 Indicate each type of door, size, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, glazed openings, arrangement of hardware and fire rating where applicable.
  - .2 Indicate each type frame, elevation, profile, material, core thickness, reinforcements, glazing stops, location of anchors and exposed fastenings and finishes.
  - .3 Include a schedule which identifies each unit, with door marks and numbers which clearly correspond to the room numbering system used on the architectural drawings. Indicate doors and frames to be fire-rated.

#### **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Protect products during fabrication, transportation, site storage and erection.
- .2 Store products in strict accordance with the manufacturer's recommendations.

## **1.7 WASTE MANAGEMENT AND DISPOSAL**

- .1 Cooperate with the Construction Manager's Waste Management Coordinator in the implementation of the Waste Management Plan specified in Section 01 74 21 "Waste Management and Disposal". Handle and dispose of waste materials generated by the work of this Section, including packaging materials, in accordance with the Waste Management Plan.

## **Part 2 Products**

### **2.1 GENERAL**

- .1 Acceptable Manufacturers
  - .1 Fleming Doors and Frames
  - .2 Daybar Industries Ltd.
  - .3 Baron metal Industries
  - .4 Groupe LMT
  - .5 Approved equivalent.
- .2 Requests for substitutions will be considered in accordance with the provisions of Section 01 25 00 "Substitution Procedures". Acceptance of alternative products is subject to the approval of the Consultant.

### **2.2 STEEL**

- .1 Steel: Commercial grade steel to ASTM A 653/A 653M, wipe coat galvanized steel, coating designation ZF001 (A01), minimum base steel thickness unless noted otherwise:
  - .1 Frames: 1.6 mm (16 ga).
  - .2 Door faces:
    - .1 Exterior doors and service wing interior doors: 1.6 mm (16 ga).
    - .2 Showroom wing interior doors: 1.2 mm (18 ga).
  - .3 Top and bottom end channels: 1.2 mm (18 ga).
  - .4 Glazing stops: 0.9 mm (20 ga).
  - .5 Reinforcements:
    - .1 Lock and strike reinforcements: 1.6 mm (16 ga).
    - .2 Hinge reinforcements: 3.4 mm (10 ga).
    - .3 Flush bolt reinforcements: 1.6 mm (16 ga).
    - .4 Door closer and holder reinforcements: 2.7 mm (12 ga).

### **2.3 ACCESSORIES**

- .1 Top caps and thermal breaks: Rigid PVC extrusions to CGSB-41-GP-19Ma.
- .2 Anchors: as required to suit each specific condition.
- .3 Touch-up primer for galvanized steel sheet: Inorganic zinc-rich primer to MPI APL #19.

- .4 Door silencers: Single stud rubber/neoprene type, 3 per door.
- .5 Primers: Organic zinc-rich primer to MPI APL #18.
- .6 Core material: Interior and fire-rated doors: Mineral fibre insulation to CAN/ULC-S702, Type 1A, 24 kg/m<sup>3</sup>
- .7 Screws: Stainless steel screws with countersunk flat head.
- .8 Door silencers: Type 6-6-180 black neoprene.
- .9 Frame anchors:
  - .1 Frames in steel stud partitions: 0.9 mm minimum steel anchors of suitable design, securely welded inside of each jamb.
  - .2 Fire resistance labelled frames: To ULC or WH requirements.
- .10 Floor anchors: 1.6 mm minimum adjustable floor clip angles with two holes for anchorage to the floor.
- .11 Labels for fire-rated doors and frames: Brass plates rivetted to door and frame.
- .12 Other components: Provide other door and frame components in accordance with CSDFMA requirements.

## **2.4 FABRICATION**

- .1 Fabricate doors and frames as detailed, to Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA) Canadian Manufacturing Specifications for Steel Doors and Frames, except where specified otherwise. Reinforce door and frames to suit hardware requirements specified in Section 08 71 10 "Door Hardware".
- .2 Blank, reinforce, drill and tap doors and frames for mortised hardware. Reinforce doors and frames for surface mounted hardware.
- .3 Specified reinforcement is the minimum requirement. Provide additional reinforcement where required to ensure a permanent, rigid, trouble-free installation able to withstand the stresses of heavy usage.
- .4 Cut, shear, straighten and work the steel in a manner which will prevent disfigurement of the finished work.
- .5 Punch frames for rubber door bumpers.
- .6 Fill seams and joints and weld depressions with epoxy metal filler, disk-sand to a smooth, flat, uniform, scratch-free surface, with all arrases sharp and true-to-line. Ream drilled and punched holes and remove all burrs.

- .7 Finished work shall be free of warp, open seams, buckles, weld and grind marks and other surface defects detrimental to the production of a good paint finish.
- .8 Conceal all fastenings except those required for loose glazing stops.
- .9 Welding shall conform to CSA-W59.

## **2.5 FABRICATION OF DOORS**

- .1 Doors shall be swing-type, flush.
- .2 Doors to be hollow steel construction. Form each face sheet for exterior and interior doors from a single steel sheet.
- .3 Weld longitudinal edges. Top and bottom shall be closed with recessed spot welded channel closures. Grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Provide recessed spot-welded channels at the top and bottom of fire-rated doors. Provide flush top caps on all doors with electronic contacts. Edges to be welded and seams filled.
- .5 Bevel the opening edge of the door to provide clearance for a tighter fit in frame.
- .6 Provide reinforcement and drill holes in the locations and diameters required in accordance with hardware requirements and templates. Refer to Section 08 71 10 "Door Hardware".
- .7 Provide fire labelled doors where indicated in the Door Schedule. Fire rated doors shall be tested in strict conformance with CAN/ULC-S104 or NFPA 252 and listed by an agency acceptable to the authorities having jurisdiction. Construct doors as detailed in Follow-Up Service Procedures/Factory Inspection Manuals issued by the listing agency to individual manufacturers.
- .8 Attach ULC labels to doors where applicable.
- .9 Touch up galvanized finish damaged during fabrication with zinc-rich primer and leave all surfaces ready to receive paint finish by Section 09 91 00.

## **2.6 FABRICATION OF FRAMES: GENERAL**

- .1 Frames to be manufactured by the same manufacturer as doors.
- .2 Frames to be continuously welded construction. Spot welded or knockdown frames are not acceptable.
- .3 Cut mitres and joints accurately and weld continuously on inside of profile. Accurately cope and securely weld butt joints of mullions, transom bars, centre rails and sills.
- .4 Grind welded joints to a flat plane, fill with metallic paste filler and sand to uniform smooth finish.

- .5 Conceal fastenings except where exposed fastenings are indicated.
- .6 Make provision for glazing as indicated and provide the following:
  - .1 Channel formed glazing stop, 16 mm high.
  - .2 Screw fixing with countersunk oval head sheet metal screws.
- .7 Protect mortise cutouts with steel guard boxes.
- .8 Protect strike and hinge reinforcements using guard boxes welded to frames.
- .9 Reinforce head of frames wider than 1200 mm (4'-0").
- .10 Securely attach floor anchors to the inside of each jamb profile.
- .11 Weld in two temporary jamb spreaders per frame to maintain proper alignment during shipment.
- .12 Provide for appropriate anchorage to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on the hinge jamb and directly opposite on the strike jamb.
  - .1 Fabricate frames in steel stud partitions with steel anchors with minimum 4 for each jamb up to 2280 mm high and 5 for each jamb from 2280 to 2440 mm high.
- .13 Provide single stud rubber door silencers. Install three on strike jamb for each single door and two at head for each pair of doors.
- .14 Provide fire labelled frames where indicated in the Door Schedule. Fire rated frames shall be tested in strict conformance with CAN/ULC-S104 or NFPA 252 and listed by an agency acceptable to the authorities having jurisdiction. Construct frames as detailed in Follow-Up Service Procedures/ Factory Inspection Manuals issued by the listing agency to individual manufacturers.
- .15 Attach ULC or Warnock Hersey labels to frames, where applicable.
- .16 Touch up galvanized finish damaged during fabrication with zinc-rich primer to MPI APL #18 and leave all surfaces ready to receive paint finish by Section 09 91 00.

### **Part 3 Execution**

#### **3.1 INSTALLATION GENERAL**

- .1 Install doors, frames and hardware in accordance with ANSI/DHI A115 IG.
- .2 Install labelled doors, frames and hardware in accordance with NFPA 80.

### **3.2 FRAME INSTALLATION**

- .1 Set frames plumb, square, level and at correct elevation and secure anchorages and connections to adjacent construction.
- .2 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.
- .3 Make allowances for deflection of structure to ensure structural loads are not transmitted to frames.
- .4 Refer to Section 07 92 00 "Joint Sealants" for application of sealant around the perimeter of the frames.
- .5 For glazing refer to Section 08 80 00 "Glazing".

### **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".
- .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:
    - .1 Generally: 13 mm.
    - .2 Doors identified as undercut: 25 mm.
- .3 Adjust operable parts for smooth, correct function.
- .4 For glazing refer to Section 08 80 00 "Glazing".

**END OF SECTION**