

**Part 1            General**

**1.1                REFERENCES**

- .1 American Society for Testing and Materials (ASTM):
  - .1 ASTM A591/A591M-98 Standard Specification for Steel Sheet, Electrolytic Zinc-Coated, for Light Coating Weight (Mass) Applications
  - .2 ASTM A653/A653M-04a Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc Iron Alloy coated (Galvannealed) by the Hot-Dip Process, Lock-Forming Quality
  - .3 ASTM A924/A924M-04 Standard Specification for General Requirements for Sheet Steel, Metallic-Coated by the Hot-Dip Process
- .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):
  - .1 CAN/CSA G40.20/G40.21-04 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steels
  - .2 CSA W59-03 Welded Steel Construction (Metal Arc Welding)
- .4 Underwriters' Laboratories of Canada (ULC):
  - .1 CAN4-S104-1980 (R1985) Fire Tests of Door Assemblies
  - .2 CAN4-S105-1985(R1992) Fire Door Frames Meeting the Performance Required by CAN4-S104
- .5 Canadian Steel Door and Frame Manufacturers' Association, (CSDFMA):
  - .1 CSDFMA Specifications for Commercial Steel Doors and Frames, 1995
  - .2 CSDFMA Recommended Selection and Usage Guide for Commercial Steel Doors, 1995
- .6 National Fire Protection Association (NFPA):
  - .1 NFPA 80-1999 Fire Doors and Windows
  - .2 NFPA 252-2003 Standard Methods of Fire Tests of Door Assemblies
- .7 ITS/Warnock Hersey Professional Services Ltd. (WHI):
  - .1 Fire Rating Services, Building Materials and Equipment, Listings (ITS/WH)

## 1.2 SUBMITTALS

- .1 Comply with requirements of Section 01 33 00.
- .2 Shop Drawings: Clearly indicate general construction of each type of door, configurations, material, material thickness, jointing methods, mortises, reinforcements, anchors, finish and special features.
- .3 Reference door types to Door Schedule. Indicate door numbers where applicable.

## 1.3 QUALITY ASSURANCE

- .1 Manufacture fire door and frame components and assemblies to ULC or ITS-Warnock Hersey requirements.
- .2 Doors shall bear testing agency label indicating fire endurance rating for standard doors.
- .3 Hollow Metal Trades Association - Canadian Manufacturing Standards for Metal Doors and Frames.

## Part 2 Products

### 2.1 MATERIALS

- .1 Steel Sheet
  - .1 Interior Doors and Frames: Electrolytic zinc coated steel sheets in accordance with ASTM A591/A591M, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher levelled standard of flatness
- .2 Door Cores
  - .1 Honeycomb: Structural small cell (25 mm (1") maximum) kraft paper honeycomb; minimum weight 36.3 kg (80#)/ream; minimum density 16.5 kg/m<sup>3</sup> (1.03 ft<sup>3</sup>); sanded to the required thickness
- .3 Adhesives
  - .1 Core Adhesive: Heat resistant, single component, polyurethane reactive (water) hot melt, thermoset adhesive
  - .2 Interlocking Edge Seam Adhesive: Resin reinforced polychloroprene (RRPC), fire resistant, high viscosity, and sealant/adhesive
- .4 Primer
  - .1 Rust inhibitive primer meeting CAN/CGSB 1.132, shop prime coat doors and frames before delivery; grey or red coloured primer; clear primer not acceptable; provide primer for field touch-up

.5 Accessories

- .1 Floor Anchors, Channel Spreaders, 1.6 mm (0.060") tee anchors, 1.20 mm (0.048") Wall Stud Anchors, and as follows:
  - .1 Hot-dipped zinc coated for exterior locations
  - .2 Wipe coat galvanized for interior locations
  - .3 Corrugated, galvanized tee anchors for masonry bond
  - .4 Drill stud anchors for wire tie to studs
  - .5 Lag bolts, shields and bushing for existing or concrete openings
  - .6 Provide anchors appropriate to installation conditions
- .2 Sealant: As specified in Section 07 92 00 Sealants
- .3 Door Silencers (Bumpers): Black neoprene; three silencers on strike jambs of single door frames; two silencers on heads of double-door frames; stick on bumpers are not acceptable

**2.2 DOOR FABRICATION**

- .1 Fabricate steel doors rigid, neat in appearance, and free from defects including warp and buckle; 45 mm (1 3/4") thickness of types and sizes indicated in Section 08000 – Door, Frame and Hardware Schedule, and as follows:
  - .1 Door faces of all steel doors shall be fabricated without visible seams, free of scale, pitting, coil brakes, buckles and waves.
  - .2 Form edges true and straight with minimum radius suitable for thickness of steel used.
  - .3 Bevel lock and hinge edges 3 mm (1/8") in 50 mm (2"); confirm requirement with builder's hardware or door swing that could dictate a different bevel.
  - .4 Top and bottom of doors shall be provided with inverted, recessed, 1.6 mm (0.060") steel end channels, welded to each face sheet at 150 mm (6") O/C.
  - .5 Provide fire labelled doors for those openings requiring fire protection ratings, as indicated in Door Schedule.
  - .6 Fabricate doors with the following clearances:
    - .1 Clearance between door and frame and between meeting edges of doors swinging in pairs shall not exceed 3 mm (1/8")
    - .2 Clearance between the bottom of door and floor shall not exceed 19 mm (3/4") where there is no sill

- .3 Clearance between bottom of door and a raised non-combustible sill shall not exceed 10 mm ( $3/8$ "
- .4 Clearance between bottom of door and nominal surface of combustible floor coverings shall not exceed 12 mm ( $1/2$ "
- .2 Interior Doors: Flush, lock seam construction, hollow metal doors fabricated in accordance with CSDFMA Manufacturing Specifications for Doors and Frames, and as follows:
  - .1 Face sheets: Minimum 1.6 mm (0.060") base steel sheet thickness
  - .2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet
  - .3 Longitudinal edges mechanically interlocked, adhesive assisted with edge seams tack welded, filled and sanded flush with no visible seam
- .3 Fire Rated Doors: Flush, lock seam construction, hollow metal doors fabricated in accordance with CAN4 S104 and NFPA 80, and as follows:
  - .1 Face sheets: Minimum 1.6 mm (0.060") base steel sheet thickness
  - .2 Stiffened and sound deadened with honeycomb core laminated under pressure to each face sheet
  - .3 Longitudinal edges mechanically interlocked, adhesive assisted with edge seams tack welded, filled and sanded flush with no visible seam
  - .4 Equip pairs of fire labelled doors with minimum 2.7 mm (0.105") steel surface mounted flat bar astragal, shipped loose for application on site
  - .5 Labelled by Underwriters Laboratories of Canada, ITS/Warnock Hersey, or other testing laboratory approved by the authority having jurisdiction

## 2.3 FRAME FABRICATION

- .1 Fabricate door frames with mitred corners of frames and weld continuously along inside of frame profile, or lap and weld concealed corner plates, making exposed faces flush, mitres tight, filled, and finished smooth, and as follows:
  - .1 Knock-down ("KD") frames are not acceptable and will be rejected.
  - .2 Jambs, heads, mullions, sills and centre rails shall be straight and uniform throughout their lengths
  - .3 Factory assembled frame product shall be square, free of defects, warps or buckles.
  - .4 Accurately cope joints at mullions, transom bars, sills or centre rails, butted and tightly fitted, with faces securely welded, matching corner joint faces.

- .5 Fabricate frames in sections for field splicing where required due to site access, or when shipping limitations dictate smaller assemblies, and as follows:
  - .1 Provide 1.60 mm (0.060") splice plates for field spliced jambs, heads and sills, securely welded into one section, extending 100 mm (4") minimum each side of splice joint.
  - .2 Provide 1.60 mm (0.060") splice plates for field splices at closed sections (mullions or centre rails) securely welded to the abutting member; extend 100 mm (4") minimum into closed sections when assembled.
  - .3 Field splice joints shall be welded, filled and ground to present a smooth uniform surface after assembly is complete.
- .6 Provide two (2) temporary steel jamb spreaders welded to the base of the jambs or mullions to maintain proper alignment during shipping and handling; remove spreaders before anchoring frame to floor.
- .7 Prepare door opening for single stud door silencers, three (3) for single door openings, two (2) for double door openings; shipped loose for installation after finish painting.
- .8 Provide fire labelled frames for those openings requiring fire protection ratings, as indicated Door Schedule.
- .2 Frames
  - .1 Interior Frames: 1.60 mm (0.060") minimum for single doors; 1.90 mm (0.075") for frames with opening width in excess of 1220 mm (48"), with 50 mm (2") face standard frame profile, throat and frame width to suit wall construction

## 2.4 HARDWARE PREPARATION

- .1 Prepare doors in coordination with hardware schedule in Section 08 70 00 and templates provided by the hardware supplier, and as follows:
  - .1 Fully Templated Mortised Hardware: Factory blank, reinforce, drill and tap doors
  - .2 Non-Fully Templated Mortised Hardware: Factory blank and reinforce only
  - .3 Surface Mounted Hardware: Factory reinforce only
  - .4 Templated Holes 13 mm (½") and Larger: Factory prepared, except mounting and through bolt holes shall be site prepared at the time of application
  - .5 Templated Holes Less Than 13 mm (½") Ø: Factory prepared only when required for the function of the device (for knobs, levers, cylinders, thumb or turn pieces) or when holes overlap function holes
  - .6 Site drill and tap for surface mounted hardware or mortised hardware that is not fully templated at the time of hardware application

- .2 Hardware Reinforcement for Doors and Frames: carbon steel, welded in place, prime painted, to the following minimum thicknesses:
  - .1 Hinge, pivot and panic bar reinforcements 3.5 mm (0.138")
  - .2 Lock face, flush bolts, concealed bolts 1.6 mm (0.060")
  - .3 Strike reinforcements 1.6 mm (0.060")
  - .4 Concealed or surface closer reinforcements 2.7 mm (0.105")
  - .5 Door jamb reinforcement,  
structural steel shape 100 mm (4") x 38 mm (1½")
  - .6 Door surface hardware reinforcements 1.6 mm (0.060")
  - .7 Frame surface hardware reinforcements 2.7 mm (0.105")
  - .8 Guard boxes to protect mortised cut-outs from mortar  
or spray applied insulation, fully welded 0.80 mm (0.031")

## **2.5 FINISHING**

- .1 Shop apply zinc-rich primer, repair damaged zinc coatings arising from fabrication; cure primer fully before shipping to site.
- .2 Remove weld slag and splatter from exposed surfaces.
- .3 Fill and sand smooth all tool marks, abrasions and surface blemishes to present smooth uniform surfaces.
- .4 Field apply, factory supplied touch-up primer on exposed surfaces where zinc coating has been damaged during installation.

## **Part 3 Execution**

### **3.1 FRAME INSTALLATION**

- .1 Install steel doors, frames, and accessories in accordance with Shop Drawings, CSDFMA Installation Guide, manufacturer's data, and as specified.
- .2 Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set; limit of acceptable frame distortion 2 mm (1/12") out of plumb measured on face of frame, maximum twist corner to corner of 3 mm (1/8"); align horizontal lines in final assembly.
- .3 Remove temporary braces and spreaders after completion of adjacent work, leaving surfaces smooth and undamaged after wall construction is completed.

- .4 Place frames before construction of enclosing walls and ceilings, and as follows:
  - .1 Masonry construction: Provide a minimum of three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb.
  - .2 Metal Stud Partitions: Provide a minimum of three wall anchors per jamb; install adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb; attach wall anchors to studs with screws.
  - .3 Install an additional anchor at hinge and strike jambs for openings 2286 mm (90") or more in height.
- .5 Field assemble large screens to provide true and even alignment with flush butt hairline jointing, all fasteners concealed.
- .6 Do not site-weld unless approved by Consultant in writing for the specific screen.
- .7 Provide formed steel drip section full width of frame opening for exterior doors.
- .8 Install fire rated frames in accordance with NFPA 80.

### **3.2 DOOR INSTALLATION**

- .1 Fit hollow-metal doors accurately in frames within clearances required for proper operation; shim as necessary for proper operation..
- .2 Install hardware in accordance with manufacturers' templates and instructions.
- .3 Adjust operable parts for correct clearances and function.
- .4 Install fire rated doors within clearances specified in NFPA 80.

### **3.3 ADJUSTING AND CLEAN UP**

- .1 Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of air-drying primer compatible with factory applied primer, and as follows:
  - .1 Clean exposed surfaces with soap and water to remove foreign matter before site touch-up.
  - .2 Finish exposed field welds to present a smooth uniform surface and touch-up with rust inhibitive primer
  - .3 Touch-up exposed surfaces that have been scratched or otherwise marred during shipment, installation or handling with rust inhibitive primer.
- .2 Keep steel surfaces free of grout, tar or other bonding materials or sealers; clean grout or other bonding material from surfaces immediately following installation.

**END OF SECTION**