

1 GENERAL

1.01 RELATED REQUIREMENTS

.1 Refer to Division 1, General Requirements.

.2 All Contract Documents form an integral part of this Section.

1.02 REFERENCE STANDARDS

- .1 American Society for Testing and Materials International (ASTM)
 - .1 ASTM A 653/A 653M-06a, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - .2 ASTM B 29- 03 , Standard Specification for Refined Lead.
 - .3 ASTM B 749- 03 , Standard Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .3 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-1.181Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 41-GP-19MaRigid Vinyl Extrusions for Windows and Doors.
- .4 Canadian Standards Association (CSA International)
 - .1 CSA-G40.20- 04 /G40.21-04 General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
 - .2 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
- .5 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 .
- .6 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.
- .7 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.
- .8 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- 03 , Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .4 CAN4-S104- M80 , Standard Method for Fire Tests of Door Assemblies.
 - .5 CAN4-S105- M85 , Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.

1.03 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.

1.04 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Samples: Sample of materials may be requested by Departmental Representative for review.
- .2 Shop Drawings: Submit shop drawings to the Departmental Representative for review. Submit shop drawings prior to fabrication in accordance with General Conditions and any amendments thereto under Supplementary Conditions, and as follows:
 - .1 Doors and frames to be coded as per numbers in Architectural Door Schedule.
 - .2 Detail method of assembly, reinforcing, fastening, field jointing, splicing, stop securing.
 - .3 Indicate thickness and gauge of all materials.
 - .4 Indicate material and quality of all finishes.
 - .5 Identify, mark and key for site locations. Markings to be concealed when hollow metal items are installed and finished.
 - .6 Include legend indicating all abbreviations and symbols.
- .3 Verify door and frame size by site measurement where walls are to be built prior to shop fabrication of frames and doors, and where locations will determine door and frame sizes.
- .4 Submit cut-sheets and MSDS (Material Data Safety Sheets), for each product used in the building.

1.06 DELIVERY, STORAGE AND HANDLING

- .1 Deliver all hollow metal doors and pressed steel frames to the site fully protected and with adequate location and installation details. Deliver to the site in accordance with construction schedule prepared by the Contractor.
- .2 Provide packaging such as cardboard or other containers, separators, banding and paper wrappings as required to completely protect all metal doors and frames during transportation and storage.
- .3 Store all hollow metal work in a dry location; off and away from ground contact; protect by suitable means required for installation; brace and stack to prevent racking, bending, twisting, or any other damage.

.4 Leave spreaders in place until frames are braced or anchored in final locations.

.5 In the event of damage, immediately make all repairs and replacements necessary to the acceptance of the Departmental Representative and at no additional cost to the Departmental Representative.

2 PRODUCTS

2.01 HOLLOW METAL DOORS

- .1 Hollow metal doors shall be fabricated from minimum 18 gauge steel having zinc coating finish, ZF075 for interior doors, and Z275 for exterior doors; 45 mm thick, full flush face, edge seam only.
- .2 Core material to interior doors shall be phenolic or resin impregnated kraft paper formed into a honeycomb core reinforcing to support door every 25 mm.
- .3 Core materials to exterior doors to be inorganic glass fibre preformed slab insulation of 72.1 Kg/m³. density, or polyurethane rigid insulation to door manufacturer's standard.
- .4 Doors shall have seamless faces and continuous vertical mechanical interlocking joints at lock and hinge edges with visible edge seams.
- .5 All doors shall be "vermin and water proof" at the top and bottom edges. The top surface shall be ground smooth so as not to collect dust or water. Seal top and bottom edges of all door integrally with door construction or use 16 gauge inverted steel channels welded to form flush closure. Tops and Bottoms shall be factory primed. Exposed hardware reinforcements at these doors shall be caulked so as to waterproof the core of the door.
- .6 Flush end closure shall be installed and sealed to recessed channel at top of out-swinging exterior doors, as per manufacturer's standard.
- .7 Glazing stops for lights in hollow metal doors shall be 20 gauge zinc coated steel formed, screw-on stops.
- .8 Fabricate stile and rail glazed hollow metal doors as indicated, 45 mm thick, from minimum 18 gauge steel having ZF075 zinc coating for interior doors and Z275 for exterior doors.
- .9 Stile and rail dimensions as detailed. Fabricate doors as specified above for flush hollow metal flush doors.

2.02 INTERIOR METAL WINDOWS

- .1 Fabricate frames from 16 gauge zinc coated steel stock as specified under clause 2.01 for door frames, all welded construction; complete with 20 gauge zinc coated steel formed screw-on glazing stops of the same material as frames. Countersink stops for OH screw attachment.
- .2 Frame profiles and dimensions shall be as detailed.
- .3 Stops shall be 16 mm high by 13 mm wide, as detailed.
- .4 Frames for interior windows shall be fabricated to accommodate single glazing as detailed in drawing package.

2.03 FABRICATION & MANUFACTURE

- 2.03.1 Fabricate all hollow metal work in accordance with profiles as reviewed shop drawings. Flat work to be leveled and straight with surfaces smooth and true.
- 2.03.2 Edges, angles and corners to be square, clean and smooth. Curved work to be true to radii.
- 2.03.3 After welding, units to be square and true, free from distortion, such as wracking or twisting. Maximum twisting to be limited to 3 mm measured on diagonal of door.
- 2.03.4 Fabricate frames in sections as large as practicable to minimize field jointing.
- 2.03.5 Mitre all corners of frames, reinforce and fully weld in accordance with manufacturer's standard.
- 2.03.6 Glazing stops to be mitred at corners and drilled for countersunk screws. Corners to be sanded smooth with no sharp edges.

2.04 ANCHORS

- 2.04.1 Floor Anchors: Shall be securely welded inside each jamb, with two (2) holes provided at each jamb for floor anchorage. Anchors shall be a minimum of 14 gauge steel.
- 2.04.2 Wall Anchors: Shall be as follows:
 - 2.04.2.1 Steel Stud Partitions: Wall anchors shall be welded "U" type steel twist type anchor.
 - 2.04.2.2 Number of wall anchors provided on each jamb shall be as follows.
 - 2.04.2.2.1 Frames up to 2134 mm high: Three (3) anchors minimum.
 - 2.04.2.2.2 Frames over 2134 mm high: Four (4) anchors min. and not less than 1 per each 610 mm or portion thereof.

- 2.04.3 Steel Spreaders: All pressed steel door frames shall be provided with steel spreader temporarily attached to the feet of both jambs to serve as a brace during shipping and handling.

2.05 HARDWARE PREPARATION

- 2.05.1 Door Reinforcement: Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware in conformance with the final reviewed hardware schedule and templates provided by the hardware supplier. Where surface mounted hardware is to be applied doors shall have reinforcing plates only with drilling and tapping done on site. Installation of the hardware into the door shall not allow the passage of air through the holes cut into the face or sides of the steel door skin. Penetrations shall be air and moisture tight.
- 2.05.2 Frames shall be mortised, reinforced, drilled and tapped at the factory for fully templated, mortised hardware only, in accordance with final reviewed hardware schedule and templates provided by the hardware supplier. Where surface mounted hardware is to be applied, frames shall have reinforcing plates only, with drilling and tapping done on site. Installation of the hardware into the door frame shall not allow the passage of air through the holes cut into the face or sides of the steel door frame. Penetrations shall be air and moisture tight. Provide fully welded back boxes at all hardware connections.
- 2.05.3 Hardware Reinforcing Plates: Minimum thickness shall be follows:
- 2.05.3.1 Hinge and pivot reinforcements: Shall be 10 gauge.
 - 2.05.3.2 Strike reinforcements: Shall be 12 gauge.
 - 2.05.3.3 Flush bolt reinforcements: Shall be 12 gauge.
 - 2.05.3.4 Closer reinforcements: Shall be 12 gauge.
 - 2.05.3.5 Reinforcements for lock face, flush bolts, concealed holders, concealed or surface mounted closers: Shall be 12 gauge.
- 2.05.4 All reinforcing plates shall be hard-tempered steel.

2.06 FINISHING

- 2.06.1 Sand and clean surfaces prior to epoxy filler application.
- 2.06.2 Fill seams, depressions, intersecting corners completely with epoxy filler and sand smooth.
- 2.06.3 Clean and chemically treat metal to provide maximum paint adhesion.

2.07 FRAMES FABRICATION GENERAL

- .1 Fabricate frames in accordance with CSDMA specifications.
- .2 Fabricate frames to profiles and maximum face sizes as indicated.
- .4 Interior frames: 1.6 mm welded type construction.
- .5 Blank, reinforce, drill and tap frames for mortised, templated 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.

2.08 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.

2.09 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 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only.

2.12 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass as indicated.
- .2 Fabricate doors with longitudinal edges welded. Seams: visible grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish .
- .3 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .4 Reinforce doors where required, for surface mounted hardware. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .5 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.
- .6 Manufacturer's nameplates on doors are not permitted.

3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.02 INSTALLATION GENERAL

- .1 Install doors and frames to CSDMA Installation Guide.

3.03 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 .

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3.04 DOOR INSTALLATION

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and per drawings and schedules.
- .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, top of carpet noncombustible sill and thresholds : 13 mm.
- .3 Adjust operable parts for correct function.
- .4 Install louvres.

3.05 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.

3.06 GLAZING

- .1 Install glazing for doors and windows in accordance with drawings and schedules.

END OF SECTION