

1 General

1.1 **SECTION INCLUDES**

- .1 Labour, Products, equipment and services necessary for metal door, frame and screen work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 ASTM A653/A653M, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealed) by the Hot-Dip Process.
- .2 ASTM A924/A924M, Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
- .3 ASTM E90, Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- .4 CAN4/ULC-S104M, Standard Method for Fire Test of Door Assemblies.
- .5 CAN4/ULC-S105M, Standard Specification for Fire Door Frames, Meeting the Performance Required by CAN4/ULC-S104M.
- .6 CAN/CGSB-1.198, Cementitious Primer, (for Galvanized Surfaces).
- .7 CGSB 41-GP-19Ma, Rigid Vinyl Extrusions for Windows and Doors.
- .8 CAN/ULC-S702, Thermal Insulation, Mineral Fibre for Buildings.
- .9 CSA W47.1, Certification of Companies for Fusion Welding of Steel Structures.
- .10 CSA W59-M, Welded Steel Construction (Metal Arc Welding).
- .11 CSDMA, Canadian Steel Door Manufacturers Association.
- .12 NFPA 80, Standard for Fire Doors and Other Opening Protectives.

1.3 **DESIGN REQUIREMENTS**

- .1 Design exterior frame assemblies to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- .2 Sound rated windows and screens: Design hollow metal windows/screens to accommodate sizes of insulating glass units and meet intended STC ratings.

1.4 **SUBMITTALS**

- .1 Product data: Submit manufacturer's Product data in accordance with Section 01 10 10 indicating door and frame construction.
- .2 Shop drawings:
 - .1 Submit shop drawings in accordance with Section 01 10 10 for each type of door and frame indicating:
 - .1 Thickness and type of steel.
 - .2 Thickness and type of core.
 - .3 Thickness and type of steel stiffeners and location of them within the door.
 - .4 Thickness and type of metal facing on edges of door and method of fastening.
 - .5 Location of mortises, reinforcement, anchorages, joining, welding, sleeving, exposed fasteners, openings and arrangement for hardware.
 - .2 Include schedule identifying each unit with door marks and numbers relating to numbering on Contract Drawings and in door schedule. Indicate doors and frames to be fire rated.
- .3 Schedule: Provide a schedule of hollow metal work prepared by or under the supervision of supplier, using same reference numbers for details and openings as those on Drawings. Coordinate with final Door Hardware Schedule.

1.5 **QUALITY ASSURANCE**

- .1 Perform work in accordance with requirements of the Canadian Steel Door Manufacturer's Association (CSDMA).
- .2 Label and list fire rated doors and frames by an organization acceptable to authorities having jurisdiction and accredited by the Standards Council of Canada in conformance with CAN4/ULC-S104M and CAN4/ULC-S105M for ratings indicated, Labelling shall be in accordance with NFPA 80.

2 Products

2.1 **ACCEPTABLE MANUFACTURERS**

- .1 Hollow metal doors: 16 ga. hollow metal doors with continuous welded seams, 'Fleming H-Series Door' by Fleming Doors Products or approved alternative as approved by the Owner.
- .2 Hollow metal frame:
 - .1 16 ga. hollow metal door frames complete with pre-drilled and countersunk attachment holes, manufactured by Fleming Doors Products.
 - .2 Or approved alternative as approved by the Owner.

2.2 MATERIALS

- .1 General: All materials under work of this Section, including but not limited to, primers are to have low VOC content limits.
- .2 Steel: ASTM A924/A924M, Class 1; Commercial grade steel, hot dip galvanized to ASTM A653/A653M, ZF120 galvanized coating.
- .3 Minimum base steel thickness:
 - .1 Frames 1.6 mm
 - .2 Typical doors 1.6 mm
 - .3 Interior stiffeners 0.9 mm
 - .4 Lock/strike reinforcements 1.6 mm
 - .5 Hinge reinforcements 2.7 mm
 - .6 All other reinforcement 1.6 mm
 - .7 Top and bottom channels 1.2 mm
 - .8 Glazing stops 0.9 mm
 - .9 Guard boxes 0.9 mm
 - .10 Jamb spreaders 0.9 mm
- .4 Top caps and thermal breaks: CGSB 41-GP-19Ma; Rigid PVC extrusions.
- .5 Primer: CAN/CGSB 1.198.
- .6 Core material:
 - .1 Interior doors: Mineral fibre insulation with a minimum face density of 24 kg/m³.
 - .2 Exterior doors: Rigid poly/isocyanurate, closed cell insulation, 32 kg/m³, thermal value: RSI 1.9.
 - .3 Fire rated doors: Mineral fibre insulation to CAN/ULC S702, Type 1A; 24 kg/m³.
- .7 Screws: Stainless steel screws with countersunk flat head.
- .8 Door silencers: Type 6-180, black neoprene.
- .9 Frame anchors:
 - .1 Frames in masonry: 1.2 mm minimum, adjustable T-strap jamb anchors.
 - .2 Frames in steel stud partitions: 0.9 mm minimum steel anchors of suitable design securely welded inside each jamb.
 - .3 Frames in precast: Countersunk galvanized expansion bolts complete with galvanized anchor, base anchors, and spacers behind hollow metal frame.
 - .4 Labeled frames: In accordance with ULC requirements.
- .10 Floor anchors: 1.6 mm minimum adjustable floor clip angles with 2 holes for anchorage to floor.
- .11 Grout: In accordance with Section 04 22 00, for full grouting of frames.

- .12 Labels for fire doors and door frame: Brass plate, riveted to door and door frame.
- .13 Grilles: Corrosion resistant steel with baked enamel finish. Model 61DG Series by Nailor Industries Inc or approved alternative by Hart and Cooley.
- .14 Glass and glazing materials: As specified in Section 08 80 00.

2.3 FABRICATION

- .1 General:
 - .1 Fabricate doors and frames in accordance with reviewed shop drawings.
 - .2 Welding: CSA W59-M to produce a finished unit with no visible seams or joints, square, true and free of distortion.
 - .3 Welding: Continuous unless specified otherwise. Execute welding by a firm fully acceptable to the Canadian Welding Bureau to requirements of CSA W47.1.
 - .4 Form profiles accurately to details shown on Contract Drawings.
 - .5 Ream and remove burrs from drilled and punched holes.
 - .6 Grind welded corners and joints to a flat plane and fill with metallic filler and sand to a uniform smooth finish. Apply one coat of primer.
 - .7 Provide weather strip for exterior doors in accordance with Section 08 70 00 and door manufacturer.
 - .8 Unless otherwise indicated, overall door thickness to be 45 mm.
- .2 Frames, windows, and screens:
 - .1 Fabricate frames of welded construction. Cut mitres and joints accurately and weld continuously on inside of frame profile. Exterior frames to be thermally broken.
 - .2 Fabricate acoustically rated windows/screens to achieve intended STC ratings as indicated on drawings and in accordance with ASTM E90.
 - .3 Construct large frame sections with provision for on Site assembly to suit Site conditions.
 - .4 Blank, reinforce, drill and tap frames for mortised, templated hardware. Protect mortised cut-outs with guard boxes.
 - .5 Reinforce frames where required for surface mounted hardware.
 - .6 Reinforce frames over 1200 mm wide with roll formed steel channels or hollow structural sections specified in Section 05 50 00 and as indicated on drawings.
 - .7 Furnish exterior door frames with a continuously welded integral steel weather drip at head of frame.
 - .8 Prepare each door opening for single stud rubber door silencers, 3 for single door openings located in strike jamb, and 2 for double door openings located in head.
 - .9 Install 2 channel or angle spreaders per frame, to ensure correct frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting in place.

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- .10 Form channel glazing stops minimum 16 mm height, accurately cut, mitred, fitted and fastened to frame sections with stainless steel counter-sunk, flat head screws spaced at maximum 450 mm throughout and 50 mm from each end.
 - .11 Provide the following requirements for electrified frame applications:
 - .1 Low voltage wire conduit for required electrified hardware devices.
 - .2 Junction boxes for all frame mounted electrified hardware devices, complete with required connectors to in frame low voltage wire conduit.
 - .3 Anchorage:
 - .1 Anchor units to floor and wall construction. Locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb, minimum number of anchors for each jamb:
 - .1 Frames up to 2285 mm 3 anchors.
 - .2 Frames from 2285 mm to 2440 mm 4 anchors.
 - .2 Where frames are to be set in masonry or concrete, supply adjustable anchors to trade installing frame.
 - .3 Fabricate frames for installation in steel stud partitions with steel anchors of suitable design, minimum number of anchors for each jamb:
 - .1 Frames up to 2285 mm height 4 anchors.
 - .2 Frames 2285 mm to 2440 mm 5 anchors.
 - .4 General Door Requirements:
 - .1 Hollow steel construction, flush swing type, of sizes to conform to details, schedules and reviewed shop drawings with provisions for cut-outs for glass and grilles and reinforced to receive hardware fastenings.
 - .2 Blank, reinforce, drill and tap doors for mortised, templated hardware. Where required, reinforce doors for surface mounted hardware and door closers.
 - .3 Reinforce oversized doors with steel channels and plates specified in Section 05 50 00 and as indicated on drawings.
 - .4 Where openings are required, form integral cut-outs with framing, glass stop moldings and division bars.
 - .5 Install grilles to fit tight and secure into openings.
 - .6 Bevel both stiles of single doors 1 in 16.
 - .7 Reinforce doors with galvanized metal stiffeners at 150 mm o.c.
 - .8 Provide the following requirements for electrified door applications:
 - .1 In door low voltage wire raceways.
 - .2 Steel astragals for hollow metal doors.
 - .3 Reinforcement for all door mounted electrified hardware devices as required and as indicated on Contract Drawings.
 - .5 Interior Doors:
 - .1 Supply and install inverted, recessed, fully welded channels at top and bottom of doors.
 - .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.

- .3 Fill hollow space within door and vertical stiffeners from top to bottom with mineral fibre batt insulation.
- .6 Exterior Doors:
 - .1 Supply and install inverted, recessed, fully welded channels at top and bottom of doors. Supply and install PVC top caps.
 - .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
 - .3 Fill hollow space within door from top to bottom with rigid polyisocyanurate insulation.
- .7 Fire Rated Doors:
 - .1 Supply and install inverted, recessed, spot welded channels at top and bottom of doors. Supply and install steel flush top caps on exterior doors.
 - .2 Fabricate doors with joints between front and back panels meeting on stile edges. Make joints continuously welded for entire height of door. After welding has been completed, grind joints smooth to match metal. Ensure that no filler is used in joints.
 - .3 Fabricate doors to achieve fire rating as indicated on drawings and in accordance with ULC. Provide ULC label plate on door at hinged edge midway between top hinge and head of door.
- 3 Execution
- 3.1 **EXAMINATION**
 - .1 Verify condition and dimensions of previously installed work upon which this Section depends. Report defects to Consultant. Commencement of work of this Section means acceptance of existing conditions.
- 3.2 **HOLLOW METAL DOOR, FRAME, WINDOW AND SCREEN INSTALLATION**
 - .1 Install hollow metal doors, frames, windows, and screens in accordance with reviewed shop drawings, manufacturer's written instructions and to meet CSDMA requirements.
 - .2 Install hollow metal doors, frames, windows, and screens plumb, square, level, secure, and at correct elevation.
 - .3 Install hollow metal doors, frames, and screens plumb, square, level, secure, and at correct elevation.
 - .4 Install doors clear of floor finishes, and with the correct rebate opening for the door installation. Install door silencers.

- .5 Secure anchorages and connections to adjacent construction. Brace frames rigidly in position while building-in. Remove temporary steel shipping jamb spreaders. Install wood spreaders at third points of frame rebate height to maintain frame width. Supply and install vertical supports as indicated on drawings for openings over 1200 mm in width. Remove wood spreaders after frames have been built-in.
- .6 Masonry walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with grout.
- .7 Allow for structural deflection and prevent structural loads from being transmitted to hollow metal frames.
- .8 Touch-up areas where galvanized coating has been removed or damaged with primer.
- .9 Fire rated doors: Install fire rated doors and frames in accordance with requirements of NFPA 80.
- .10 Sound rated windows/screens: Install sound rated windows/screens to achieve specified STC rating.

3.3 **ADJUSTING AND CLEANING**

- .1 Adjust doors for smooth and balanced door movement.
- .2 Clean doors, frames, windows and screens.

END OF SECTION