

1 General

1.1 WORK INCLUDED

- .1 All hollow metal (HM) steel frames, and screens as per Door Schedule, and as detailed on Drawings.

1.2 RELATED SECTIONS

- .1 Section 01 33 00 - Submittal Procedures.
- .2 Section 09 91 00 - Painting
- .3 Division 23 - Heating, Ventilating and Air Conditioning
- .4 Division 26 - Electrical: Wiring for electronic hardware.

1.3 REFERENCES

- .1 Canadian Standards Association (CSA).
 - .1 CSA A101-M1983, Thermal Insulation, Mineral Fibre, for Buildings.
 - .2 CSA W59-M1989, Welded Steel Construction (Metal Arc Welding).
 - .3 CSA-A440.S1, Canadian Supplement.
 - .4 AAMA/WDMA/CSA 101/I.S.2/A-440.
- .2 Canadian General Standards Board (CGSB).
 - .1 CAN/CGSB-1.181-92, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 51-GP-21M-78, Thermal Insulation, Urethane and Isocyanurate, Unfaced.
- .3 American Society for Testing and Materials (ASTM).
 - .1 ASTM A 525M-91b, Specification for General Requirements for Steel Sheet Zinc-Coated (Galvanized) by the Hot-Dip Process Metric.
 - .2 ASTM A 526M-90, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
 - .3 ASTM A 527M-90, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality.
 - .4 ASTM B 29-92, Specification for Pig Lead.
 - .5 ASTM B 749-85(1991), Specification for Lead and Lead Alloy Strip, Sheet and Plate Products.
- .4 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN4-S104M-M80, Fire Tests of Door Assemblies.
 - .2 CAN4-S105M-M85, Fire Door Frames.
- .5 Canadian Steel Door and Frame Manufacturers' Association (CSDFMA).
 - .1 CSDFMA, Specifications for Commercial Steel Doors and Frames, 1990.
 - .2 CSDFMA, Recommended Selection and Usage Guide for Commercial Steel Doors, 1990.
- .6 National Fire Protection Association (NFPA).
 - .1 NFPA 80-1999, Fire Doors and Windows.
 - .2 NFPA 252-1990, Door Assemblies, Fire Tests of.

1.4 DESIGN REQUIREMENTS

- .1 Design exterior frame assembly to accommodate expansion and contraction when subjected to minimum and maximum surface temperature of -35°C to 35°C.
- .2 Maximum deflection for exterior steel entrance screens under wind load of 1.2 kPa not to exceed 1/175th of span.

1.5 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate each type of door, material, steel core thicknesses, mortises, reinforcements, location of exposed fasteners, openings, glazed, arrangement of hardware and 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 door schedule.
- .5 Submit test and engineering data, and installation instructions

1.6 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 CAN4-S104M and NFPA 252 for ratings specified or indicated.
- .2 Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled. Test products in strict conformance with CAN4-S104, ASTM E 152 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.

1.7 OPENING SIZES

- .1 Method of measuring sizes:
- .2 Width - Width of openings shall be measured from inside to inside of frame jamb rabbets.
- .3 Height - Heights of openings shall be measured from the level finished floor (exclusive of floor coverings to the head rabbet of the frame.
- .4 Door sizes - Doors shall be sized so as to fit the above openings and allow 3 mm maximum clearance at jambs and head of frame. A clearance of 6 mm maximum shall be allowed between the bottom of the door and the finished floor (exclusive of floor coverings). These are considered to be nominal clearances, subject to ordinary commercial variations.

1.8 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate waste material in appropriate on-site bins in accordance with Waste Management Plan.
- .2 Divert unused paint and sealant materials from landfill to official hazardous material collections site.
- .3 Do not dispose of unused paint and sealant materials into sewer systems, into lakes, streams, onto ground or in other locations where it will pose health or environmental hazard.

2 Products

2.1 MATERIALS

- .1 Hot dipped galvanized steel sheet: to ASTM A 526M or ASTM A 527M coating designation to ASTM A 525M, ZF75, minimum base steel thickness in accordance with CSDFMA Table 1 - Thickness for Component Parts.
- .2 Reinforcement channel: to CAN/CSA-G40.21, Type 44W, coating designation to ASTM A 525M, ZF75.
- .3 Cast or rolled pure sheet lead: to ASTM B 29 or ASTM B 749, weight: 19.5 kg/m², thickness 1.6 mm
- .4 Composites: balance of core materials used in conjunction with lead: in accordance with manufacturers' proprietary design.

2.2 DOOR CORE MATERIALS

- .1 Honeycomb construction:
 - .1 Structural small cell, 24.5 mm maximum kraft paper 'honeycomb', weight: 36.3 kg per ream minimum, density: 16.5 kg/m³ minimum sanded to required thickness.
- .2 Stiffened: face sheets welded, honeycomb, insulated core.
 - .1 Fibreglass: to CSA A101, semi-rigid Type 1A density 24 kg/m³
- .3 Temperature rise rated (TRR): core composition to limit temperature rise on unexposed side of door to 250°C at 60 minutes. Core to be tested as part of a complete door assembly, in accordance with CAN4-S104, ASTM E 152 or NFPA 252, covering Standard Method of Tests of Door Assemblies and listed by nationally recognized testing agency having factory inspection service.

2.3 DOOR CONSTRUCTION

- .1 Form each face sheet for exterior doors from 16 gage sheet steel.
- .2 Form each face sheet for interior doors from 16 gage sheet steel.
- .3 Reinforce doors with vertical stiffeners, securely welded to each face sheet at 150 mm on centre maximum.
- .4 Fill voids between stiffeners of exterior doors with fibreglass core.
- .5 Fill voids between stiffeners of interior doors with fibreglass core.

2.4 DOOR FABRICATION GENERAL

- .1 Doors: swing type, flush, with provision for glass and/or louvre openings as indicated.
- .2 Exterior doors: hollow steel insulated construction. Interior doors: honeycomb construction.
- .3 Fabricate doors with longitudinal edges welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
- .4 Doors: manufacturers' proprietary construction, tested and/or engineered as part of a fully operable assembly, including door, frame, gasketing and hardware in accordance with ASTM E 330.
- .5 Blank, reinforce, drill doors and tap for mortised, templated hardware and electronic hardware.
- .6 Reinforce doors where required, for surface mounted hardware. Provide flush steel top caps to exterior doors. Provide inverted, recessed, spot welded channels to top and bottom of interior doors.
- .7 Provide fire labelled doors for those openings requiring fire protection ratings, as scheduled. Test such products in strict conformance with CAN4-S104, ASTM E 152 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.
- .8 Manufacturer's nameplates on doors are not permitted.
- .9 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .10 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

2.5 ADHESIVES

- .1 Honeycomb cores and steel components: heat resistant, spray grade, resin reinforced neoprene/rubber (polychloroprene) based, low viscosity, contact cement.
- .2 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .3 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.6 PRIMERS

- .1 Touch-up prime CAN/CGSB-1.181.

2.7 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Exterior and interior top and bottom caps: steel.
- .3 Fabricate glazing stops as formed channel, minimum 16 mm height, accurately fitted, butted at corners and fastened to frame sections with counter-sunk oval head sheet metal screws.
- .4 Metallic paste filler: to manufacturer's standard.
- .5 Fire labels: metal riveted.
- .6 Make provisions for glazing as indicated and provide necessary glazing stops.
 - .1 Provide removable steel glazing beads for use with glazing tapes and compounds and secured with countersunk steel screws.
 - .2 Design exterior glazing stops to be tamper proof.

2.8 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 When required due to site access or due to shipping limitations, frame products for large openings shall be fabricated in sections, with splice joints for field assembly by others.
- .8 Securely attach lead to inside of frame profile from return to jamb soffit (inclusive) on door side of frame only, where lead lined doors required.

2.9 FRAMES, SIDELITES AND SCREENS FABRICATION GENERAL

- .1 Fire-Rated Frames: Fabricate fire-rated frames in accordance with underwriter's requirements using material not less than the thickness specified herein unless a greater thickness is stipulated by the labelling authority.
- .2 Fabricate frames in accordance with CSDMA specifications.
- .3 Fabricate frames to profiles and maximum face sizes and indicated.
- .4 Exterior Frames: 1.5 mm wiped zinc finish steel, welded thermally broken type construction.
- .5 Interior frames: 1.5 mm welded type construction.
- .6 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier.
- .7 Protect mortised cut outs with steel guard boxes.
- .8 Manufacturer's nameplates on frames and screens are not permitted.
- .9 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .10 Insulate exterior frame components with polyurethane insulation.
- .11 Cut mitres and joints accurately and weld continuously all joints and seams on the inside of frame profile.
- .12 Grind welded corners and joints of flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .13 Stiffen frames over 1200mm unsupported width with minimum 1.2mm formed steel channel, funnel thickness and width of frame, welded into head profile.
- .14 Install 2 bumpers on strike jamb for each single door and 2 bumpers at head for pair of doors.
- .15 Provide 2 spreader bars per door frame of 1.5mm materials. Welded at base of frame to ensure alignment during shipment.
- .16 Borrowed light and screens size as noted on drawings, with removable stop for glazing of frame, on inside room side.

2.10 FRAME AND SCREEN ANCHORAGE

- .1 Provide appropriate anchorage to floor and wall construction.
- .2 Frame anchorage: locate each wall anchor immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb
- .3 Frame anchorage: Provide 2 anchors for rebate opening heights up to 1520 mm and 1 additional anchor for each additional 160 mm of height or fraction thereof
- .4 Frame anchorage: locate anchors for framed In existing openings not more than 150 mm from top and bottom of each jamb and intermediate at 660 mm o.c. maximum.

2.11 HARDWARE PREPARATION

- .1 Doors and frames shall be prepared to receive hardware.
- .2 Unless otherwise shown on the drawings, locate hardware in accordance with the Recommended Locations For Architectural Hardware as published by the Door and Hardware Institute.
- .3 Prepare doors and frames to receive electrified hardware. Frame preparation shall include the application of shallow back boxes suitable for EMT termination at all device locations. Back boxes shall be welded to frames and shall be provided for all electrified devices including door position indicators. Back boxes shall be of sufficient size allowing for wiring, connectors, and the device to be properly installed in the mortise.
- .4 Door preparation shall include the installation of conduit or suitable wire raceway within door assemblies during fabrication.

2.12 ACCEPTABLE MATERIAL

- .1 Only steel door and frame products supplied by the following CSDFMA members are eligible for use on this project:
 - .1 Ambico Limited;
 - .2 Apex Machine Works Limited;
 - .3 Daybar Industries Limited;
 - .4 Macotta Manufacturing;
 - .5 S.W. Fleming Ltd.;
 - .6 Coastal Door and Frame Ltd.

3 Execution

3.1 INSTALLATION GENERAL

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

3.2 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 center 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 Maintain continuity of vapor barrier and air barrier.

3.3 DOOR INSTALLATION

- .1 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 1.0 mm
 - .2 Latch side and head: 1.5 mm.
 - .3 Finished floor, top of carpet: 13 mm.
- .2 Adjust operable parts for correct function.
- .3 Install louvers.

3.4 FINISH REPAIRS

- .1 Touch up with primer finishes damaged during installation with zinc primer to CGSB 1-GP-181.
- .2 Fill exposed frame anchors and with metallic paste filler and sand to a uniform smooth finish.

End of Section