

1 General

1.1 RELATED REQUIREMENTS

- .1 Section 07 92 00 - Joint Sealants.
- .2 Section 08 71 00 - Door Hardware.
- .3 Section 09 91 00.08 - Painting for Minor Works.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA).
 - .1 CSAA101, Thermal Insulation, Mineral Fibre, for Buildings.
 - .2 CSA W59, 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, Ready-Mixed Organic Zinc-Rich Coating.
 - .2 CGSB 51-GP-21M, Thermal Insulation, Urethane and Isocyanurate, Unfaced.
 - .3 CAN/CGSB-82.5, Insulated Steel Doors.
 - .4 CSA W59-03, Welded Steel Construction (Metal Arc Welding).
 - .5 CAN4-S104, Standard Method for Fire Tests of Door Assemblies.
 - .6 CAN4-S105, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104.
 - .7 CAN/ULC-S702, Standard for Mineral Fibre Thermal Insulation for Buildings.
- .3 American Society for Testing and Materials (ASTM).
 - .1 ASTM A 525M, General Requirements for Steel Sheet Zinc-Coated (Galvanized) by the Hot-Dip Process Metric.
 - .2 ASTM A 526M, Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality.
 - .3 ASTM A 527M, Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality.
 - .4 ASTM A568M, Standard Specification for Steel, Sheet, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled.
 - .5 ASTM A924M, Specification for General Requirements for Steel Sheet, Metallic-Coated by Hot-Dip Process.
 - .6 ASTM C177, Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 - .7 ASTM C518, Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
 - .8 ASTM C578, Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - .9 ASTM C665, Specification for Mineral Fiber Insulation.
 - .10 ASTM C1289, Specification for faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
 - .11 ASTM D1622, Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 - .12 ASTM E90, Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - .13 ASTM E413, Classification for Rating Sound Insulation.
- .4 Underwriters' Laboratories of Canada (ULC).
 - .1 CAN4-S104M, Fire Tests of Door Assemblies.
 - .2 CAN4-S105M, Fire Door Frames.

- .3 CAN/ULC-S702 - Standard for Mineral Fibre Thermal Insulation for Buildings.
- .5 CAN/ULC-S702- Standard for Mineral Fibre Thermal Insulation for Buildings.
 - .1 CSDMA, Commercial Steel Doors and Frames.
 - .2 CSDMA, Recommended Selection and Usage Guide for Commercial Steel Doors.
- .6 National Fire Protection Association (NFPA).
 - .1 NFPA 252, Standard for Fire Tests of Door Assemblies.
 - .2 NFPA 80, Standard for Fire Doors and Fire Windows.
 - .3 UL List of Equipment and Materials, Volume 2.
 - .4 WH Certification Listings.
- .7 ANSI:
 - .1 ANSI A115, Hardware Preparations for Steel Doors and Frames.
 - .2 ANSI A115-IG, Installation Guide for Doors and Hardware.
 - .3 ANSI A224.1, Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
 - .4 ANSI A250.4, Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings.

1.3 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.
- .3 Labeled Fire-Rated Doors and Frames:
 - .1 Fire rated steel doors and frame products shall be provided for those openings as scheduled.
 - .2 Products shall bear the label of a recognized testing agency having factory inspection service, and shall be constructed as listed or classified for labeling.
 - .3 Doors provided for openings requiring fire rating only, or fire and temperature rise rating shall be tested in accordance with CAN4-S104.
 - .4 Frames, transom and sidelight assemblies provided for openings requiring fire rating, shall be tested in accordance with CAN4-S104.
 - .5 Window frames provided for openings requiring fire rating, shall be tested in accordance with CAN4-S106.
 - .6 Labeling shall be in accordance with ANSI/NFPA 80, the listing organization's policies and Follow-Up Service Procedures/Manuals.
 - .7 Fire rated door or frame component, not qualifying for labeling due to design, hardware or any other reason, shall be noted in the submittal documents, or prior to manufacture of product if hardware, glazing or other options affecting fire-rating are not available at time of submittal shop drawing preparation.
- .4 Ensure core materials for exterior doors attains thermal resistance of R 5 when tested in accordance with ASTM C177 or ASTM C518.
- .5 Provide thermally broken assemblies as indicated on Drawings, tested in accordance with requirements of CAN/CGSB-82.5-M.
- .6 Product quality shall meet standards set by (CSDMA) Canadian Steel Door and Frame Manufacturers Association.

1.4 SUBMITTALS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Product Data:
 - .1 Submit manufacturer's product specification, construction details, material, finish

- descriptions and dimensions of individual components.
- .2 Submit manufacturer's literature, data sheets for each type of material provided under this Section for project.
- .3 Data sheets shall provide all required information.
- .4 Submit required copies of detailed instructions for inclusion in maintenance manual.
- .5 Submit manufacturer's installation instructions.
- .3 Material Safety Data Sheets:
 - .1 Submit MSDS for inclusion in Operation and Maintenance Manual.
- .4 Shop Drawings:
 - .1 Show each type of frame, door, core, metal thicknesses and finishes, openings (glazed and/or louvered), fire ratings, location of exposed fasteners, cutouts, hardware blanking, reinforcing, tapping and drilling arrangements.
 - .2 Show large scale frame sections and anchoring details.
 - .3 Submit door and frame schedule identifying each unit.
 - .4 Ensure each unit bears legible identifying mark corresponding to that listed in Door and Frame Schedule.
 - .5 Fabrication shall not proceed without receipt of reviewed submittal drawings and reviewed hardware schedule.
- .5 Test Reports:
 - .1 Submit following test reports:
 - .1 Steel door and frame assemblies supplied under this Section meet acceptance criteria of ANSI A224.1 and ANSI A250.4, Level "A".
 - .2 Insulated door cores supplied in exterior doors under this Section meet specified thermal resistance rating.
 - .3 Thermally broken frames meet or exceed CAN/CGSB-82.5-M.
 - .4 Submit in addition to fire label, certificate to substantiate design and construction of fire-rated screen assemblies, if required by Departmental Representative or authorities having jurisdiction.

1.5 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.
- .3 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.

1.6 DELIVERY, STORAGE AND HANDLING

- .1 Be responsible for supply of products under this Section to site in timely manner, so as not to delay progress of other trades.
- .2 Protect doors and frames during shipping and storage.
- .3 Inspect all materials thoroughly upon receipt and report all discrepancies, deficiencies and/or damages immediately in writing to the Supplier. Note all damage on carrier's Bill of Lading.
- .4 Make good immediately any damage done. Clean scratches and touch up with rust-inhibitive primer. Replace damaged work which cannot be repaired, restored or cleaned.
- .5 Store in a dry, secure location, on planks or dunnage. Doors and frame shall be stored in a vertical position, spaced with blocking. Materials shall be covered to protect them from

damage but in such a manner as to permit air circulation. Site storage and protection of materials shall be in accordance with NAAMM-HMMA 840.

1.7 OPENING SIZES

- .1 Method of measuring sizes:
 - .1 Width - Width of openings shall be measured from inside to inside of frame jamb rabbets.
 - .2 Height - Heights of openings shall be measured from the level finished floor (exclusive of floor coverings) to the head rabbet of the frame.
 - .3 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 WARRANTY

- .1 Warrant work of this Section for period of 1 year against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Departmental Representative, and at no expense to Departmental Representative. Defects include but are not limited to; buckling, opening of seams, bond failure and extensive colour fading.

1.9 WASTE MANAGEMENT AND DISPOSAL

- .1 Collect and separate for disposal waste material generated by this Section.
- .2 Place in appropriate on-site bins in accordance with Waste Management Plan.
- .3 A clean worksite is mandatory at all times. Failure to maintain the site in a clean, safe condition shall result in the Departmental Representative initiating a clean-up and related costs being deducted from progress claims.

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.

2.2 DOORS: CORE MATERIALS

- .1 Exterior doors to have Styrene core.

2.3 DOORS: CONSTRUCTION

- .1 Form each face sheet for exterior doors from 18 ga sheet steel.
- .2 Form each face sheet for interior doors from 18 ga sheet steel.

2.4 DOORS: FABRICATION GENERAL

- .1 Doors: swing type, flush.
 - .2 Exterior doors: hollow steel styrene insulated construction.
 - .3 Fabricate doors with longitudinal edges tack welded. Seams: grind welded joints to a flat plane, fill with metallic paste filler and sand to a uniform smooth finish.
 - .4 Blank, reinforce, drill doors and tap for mortised, templated hardware.
 - .5 Reinforce doors where required, for surface mounted hardware. Provide flush vinyl top
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- caps to exterior doors.
- .6 Provide fire labelled doors for those openings requiring fire protection ratings. 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.
- .7 Manufacturer's nameplates on doors are not permitted.
- .8 Factory prepare holes 12.7 mm diameter and larger except mounting and through-bolt holes, on site, at time of hardware installation.
- .9 Provide factory-applied touch-up primer at areas where zinc coating has been removed during fabrication.

2.5 ADHESIVES

- .1 Polystyrene and polyurethane cores: heat resistant, epoxy resin based, low viscosity, contact cement.
- .2 Lock-seam doors: fire resistant, resin reinforced polychloroprene, high viscosity, sealant/adhesive.

2.6 ACCESSORIES

- .1 Door silencers: single stud rubber/neoprene type.
- .2 Metallic paste filler: to manufacturer's standard.
- .3 Sealant: Refer to Section 07 92 00 - Joint Sealants.
- .4 Door seals: Refer to Section 08 71 00 - Door Hardware.
- .5 Fire labels: metal riveted.

2.7 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.

2.8 FRAMES: 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 Blank, reinforce, drill and tap frames for mortised, templated hardware, and electronic hardware using templates provided by finish hardware supplier.
 - .6 Protect mortised cut outs with steel guard boxes.
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- .7 Manufacturer's nameplates on frames and screens are not permitted.
- .8 Provide factory-applied touch up primer at areas where zinc coating has been removed during fabrication.
- .9 Insulate exterior frame components with polyurethane insulation.
- .10 Cut mitres and joints accurately and weld continuously all joints and seams on the inside of frame profile.
- .11 Grind welded corners and joints of flat plane, fill with metallic paste filler and sand to uniform smooth finish.
- .12 Stiffen frames over 1200mm unsupported width with minimum 1.2mm formed steel channel, funnel thickness and width of frame, welded into head profile.
- .13 Install 2 bumpers on strike jamb for each single door and 2 bumpers at head for pair of doors.
- .14 Provide 2 spreader bars per door frame of 1.5mm materials. Welded at base of frame to ensure alignment during shipment.

2.9 FRAME ANCHORAGE

- .1 Frame Anchors:
 - .1 Frame anchor shall be provided with anchorage appropriate wall and frame construction.
- .2 Floor Anchors:
 - .1 Where frame is installed prior to construction of adjacent wall, each jamb shall be provided with 1.52 mm (16 ga) steel floor anchors.
 - .2 Each anchor shall be provided with 2 (two) holes for mounting to floor and shall be securely welded to inside of jamb profile.
- .3 Wall Anchors:
 - .1 Each wall anchor shall be located immediately above or below each hinge reinforcement on hinge jamb and directly opposite on strike jamb.
 - .2 Provide 2 anchors for rebate opening heights up to and including 1500 mm and one (1) additional anchor for each additional 760 mm of height or fraction thereof, except as indicated below.
 - .3 For frames in previously placed concrete, masonry or structural steel provide anchors located not more than 150 mm from top and bottom of each jamb and intermediate anchors at 660 mm on center maximum.
 - .4 Frame installed in steel stud and drywall partitions shall be provided with 20 gauge steel snap-in or "Z" stud type anchors.
 - .5 Supply frame anchors to gypsum board installers with directions for installing steel door frames in solid gypsum board partitions.
 - .6 Frame for installation in new masonry walls shall be provided with steel adjustable wall anchors of the T-strap, stirrup or wire, 16 gauge minimum or 0.156 in. diameter wire.
 - .1 Straps shall be not less than 50mm x 254mm in size, corrugated and/or perforated.
 - .7 Anchor preparations and guides shall also be located immediately above or below the intermediate hinge reinforcing and directly opposite on the strike jamb.
 - .8 Each preparation shall be provided with 16 gauge anchor bolt guides.
 - .9 Formed adjusting brackets and fasteners shall be shipped loose.
 - .10 Channels shall be mechanically connected to mounting angles and adjusting brackets with supplied fasteners, on site, by Subcontractor responsible for installation.
- .4 Fire Rated Door and Frame Assemblies:
 - .1 Conform to CAN4-S104-M, CAN4-S105-M, NFPA 80 and NFPA 252.

2.10 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.

2.11 FABRICATION

- .1 Welding: CSA W59-M.
- .2 Grind exposed welds smooth and flush. Fill open joints, seams and depressions with filler or by continuous brazing or welding. Grind smooth to true sharp arises and profiles and sand down to smooth, true, uniform finish.
- .3 Hardware Requirements and Preparations:
 - .1 Door and frame shall be blanked, reinforced, drilled and tapped at factory for fully templated hardware only in accordance with approved hardware schedule and templates provided by hardware Supplier.
 - .2 Check hardware list for requirements.
 - .3 Door and frame shall be blanked and reinforced only for mortised hardware that is not fully templated.
 - .4 Where surface mounted hardware, anchor hinges, thrust pivots, pivot reinforced hinges or non templated hardware apply, frame shall be reinforced only, with drilling and tapping done by others in field.
 - .5 Templated holes 12.7mm diameter and larger shall be factory prepared except mounting and through bolts holes which shall be by Subcontractor responsible for installation on site, at time of application.
 - .6 Templated holes less than 12.7mm diameter shall be factory prepared only when required for function of device (for knobs, levers, cylinders, thumb or turn pieces) or when these holes over-lap function holes.
 - .7 Hinge reinforcing shall be 3.42 mm (10 ga) steel minimum, high frequency type be provided.
 - .8 Cylindrical lock, ASA strike and flush bolt reinforcing shall be 2.66 mm (12 ga) steel minimum.
 - .9 Mortise lock and surface mounted hardware reinforcing shall be 1.52 mm (16 ga) steel minimum.
 - .10 Provide all hardware mortises on perimeter frame members shall be grouted.
 - .11 Refer to Section 08 71 00 -Door Hardware for openings that require electrified hardware unless indicated otherwise.
- .4 Frames - General:
 - .1 Fabricate frames for doors, screens and borrowed lights to profiles indicated.
 - .2 Reinforce frame as required for surface mounted hardware.
 - .3 For door frames wider than 1500 mm, reinforce door frame head and jamb and mullions at junction of head.
 - .4 Prepare each door opening for single stud door silencers: 3 for single door openings placed opposite hinges: 2 for double door openings approximately 150 mm each side of centreline of head stop.

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.
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3.2 FRAME INSTALLATION - GENERAL

- .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.
- .4 Provide vertical support at center of head for openings over 1200 mm wide.
- .5 Provide vertical support at center of head for openings over 1200 mm wide.
- .6 Remove temporary spreaders after frames are built-in.
- .7 Caulk perimeter of frames between frame and adjacent material.
- .8 Maintain continuity of vapor barrier and air barrier.

3.3 DOOR INSTALLATION - GENERAL

- .1 Install doors and hardware in accordance with hardware templates and manufacturer's instructions and Section 08 71 00 - Door Hardware.
- .2 Provide even margins between doors and jambs and doors and finished floor and thresholds as follows.
 - .1 Hinge side: 3 mm.
 - .2 Latch side and head: 3 mm.
 - .3 Un-finished floor, top of floor: 19 mm.
- .3 Adjust operable parts for correct function.

3.4 FIRE LABELED DOORS AND FRAMES

- .1 Install fire labeled doors and frames in accordance with manufacturer's printed instructions and NFPA 80.
- .2 Verify labeled doors and frames are placed in their designated openings.
- .3 Review, inspect and certify where required by authorities having jurisdiction.

3.5 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
