SECTION 08 11 13.16 – exterior hollow metal doors and frames

1. GENERAL
   1. SUMMARY
      * + 1. This Section includes requirements for supply and installation of the following:

Exterior hollow metal doors and frames.

* + - * 1. Related Requirements:

Section 07 92 00 – Joint Sealants.

Section 08 71 00 – Door Hardware.

Section 08 71 13 – Automatic Door Operators.

Section 08 80 00 – Glazing.

Section 09 90 00 – Painting.

* 1. DEFINITIONS
     + - 1. Base Metal Thickness: Thickness dimensions are minimums as defined in referenced ASTM standards for both uncoated steel sheet and the uncoated base metal of metallic coated steel sheets.
         2. Opening Sizes: Standard imperial door sizes indicated in on Drawing A00.30 are considered nominal dimensions, measured from frame rabbet width and height, with allowances for nominal clearances between head, jamb, and door bottom in accordance with CSDMA Recommended Dimensional Standards for Commercial Steel Doors and Frames.
  2. REFERENCE STANDARDS
     + - 1. American National Standards Institute (ANSI):

ANSI/SDI A250.7‑1997 (R2002), Nomenclature for Standard Steel Doors and Steel Frames.

ANSI/SDI A250.11-2001, Recommended Erection Instructions for Steel Frames.

* + - * 1. American Society for Testing and Materials (ASTM):

ASTM A 653/A 653M‑11, Standard Specification for Steel Sheet, Zinc‑Coated (Galvanized) or Zinc Iron Alloy‑Coated (Galvannealed) by the Hot‑Dip Process.

ASTM A 879/A 879M-12, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.

ASTM A 924/A 924M‑10a, Standard Specification for General Requirements for Sheet Steel, Metallic‑Coated by the Hot‑Dip Process.

* + - * 1. Canadian General Standards Board (CGSB):

CAN/CGSB 1.132‑M90, Primer, Zinc Chromate, Low Moisture Sensitivity.

CAN/CGSB 41‑GP‑19Ma‑78(1984), Rigid Vinyl Extrusions for Windows and Doors.

CAN/CGSB 82.5‑M88, Insulated Steel Doors.

* + - * 1. Canadian Standards Association (CSA):

CSA W59‑03 (R2008), Welded Steel Construction (Metal Arc Welding).

* + - * 1. Canadian Steel Door Manufacturers Association (CSDMA):

Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2007.

* 1. SUBMITTALS
     + - 1. Provide requested information in accordance with Section 01 33 00 – Submittal Procedures.
         2. Action Submittals: Provide the following submittals before starting any work of this Section:

Product Data:

Submit product data for each type of door and frame indicated, include door designation, type, level and model, material description, core description, construction details, label compliance, fire resistance ratings, and finishes.

Shop Drawings:

Show each type of frame, door, hardware blanking, reinforcing, tapping, and drilling arrangements, metal gauges, thicknesses, and finishes.

Show details of doors including vertical and horizontal edge details.

Submit door and frame schedule identifying each unit. Each unit shall bear a legible identifying mark corresponding to that listed in the door and frame schedule.

Samples:

Supply for Consultant's review, if requested, sample of frame corner showing construction, workmanship, and finish.

* + - * 1. Informational Submittals: Provide the following submittals when requested by the Consultant:

Source Quality Control Submittals: Submit information on zinc coating treatment and primer spot treatment, including instructions for surface treatment before site painting and any restrictions or special coating requirements.

Certificates: Submit the following certificates or letters of compliance:

Oversize Compliance: Submit oversize construction evidence indicating compliance with fire labelling for door and frame assemblies required to be fire protection rated and exceeding size limitations of labelled assemblies.

* 1. QUALITY ASSURANCE
     + - 1. Manufacturer: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer, and as follows:

Fabricate work of this Section to meet the requirements of the Canadian Steel Door and Frame Manufacturer's Association, Manufacturing Specification for Doors, and Frames as a minimum, and as further modified in this section.

Fabricator shall be a member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.

* + - * 1. Supplier: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer.
        2. Installer: Use installers who are experienced with the installation of hollow metal doors and frames of similar complexity and extent to that required for the Project.
  1. DELIVERY, STORAGE AND HANDLING
     + - 1. Coordinate deliveries to comply with construction schedule and arrange ahead for off-the-ground, under cover storage location. Do not load any area beyond the design limits.
         2. Adequately protect units against rust and damage during manufacture, delivery, and storage.
         3. Store materials on planks in a dry area and cover to protect from damage. Make good immediately any damage done. Clean scratches and touch-up with rust-inhibitive primer.
  2. SITE CONDITIONS
     + - 1. Site Measurements: Verify actual dimensions of openings by site measurements before fabrication and indicate measurements on shop drawings; coordinate fabrication schedule with construction progress to avoid delaying the Work.
         2. Established Measurements: Establish dimensions and proceed with fabricating doors and frames without site measurements where site measurements cannot be made without delaying the Work; coordinate construction to ensure that actual site dimensions correspond to established dimensions.

1. PRODUCTS
   1. MATERIALS
      * + 1. Sheet Steel:

Exterior Doors and Frames: Galvanized, AS120, steel sheets in accordance with ASTM A924/M924-14; coated to meet requirements of ASTM A653/A653M, Commercial Steel (CS), Type B; stretcher levelled standard of flatness where used for face sheets.

Interior Doors and Frames: As indicated in Section 08 11 13.13.

* + - * 1. Gauges:

Door and Screen Frames:

Gauge: 16 msg.

Doors (Honeycomb or Polystyrene Core):

Door Faces:

Gauge: 18 msg.

Top and Bottom End Channels:

Gauge: 18 msg.

Reinforcements:

Lock and Strike Reinforcements:

Gauge: 16 msg.

Hinge Reinforcements:

Gauge: 10 msg.

Flush Bolt Reinforcements:

Gauge: 16 msg.

Door Closer or Holder Reinforcements:

Gauge: 12 msg.

* + - * 1. Anchors:

As required to suit condition.

* + - * 1. Rubber Bumpers:

Three (3) per door.

* + - * 1. Weatherstrip:

Extruded aluminum with vinyl insert #W13 for head and jambs and #W5 for pairs of doors without mullions, manufactured by Crowdertrack Limited.

* + - * 1. Interior Door Cores:

Structural small cell; 25 mm (1") maximum, kraft paper honeycomb; minimum weight 36 kg/ream; minimum density 16.5 kg/m3; sanded to required thickness.

* + - * 1. Adhesives:

Core Adhesive: Heat resistant, single component adhesive recommended by manufacturer.

* + - * 1. Touch-Up Primer: Rust inhibitive primer meeting CAN/CGSB 1.132, touch up zinc coatings using shop applied primer; grey or red coloured primer, clear primer not acceptable; provide additional primer for site touch‑up to repair damaged zinc and shop applied coatings.
        2. Accessories:

Glazing Stops:

Glass Mouldings: Formed steel having 0.8 mm (1/32") metal core thickness, screw fixed.

Accurately fit and butt at corners glazing trim and stops; located on secure side of door, or interior of room window frame.

Sealant: As specified in Section 07 92 00 – Joint Sealants.

Glazing: As specified in Section 08 80 00 – Glazing.

Door Silencers (Bumpers or Mutes): Manufacturer's standard black or grey neoprene silencers; three silencers on strike jambs of single door frames; two silencers on heads of double‑door frames; stick on bumpers is not acceptable.

* 1. FABRICATION AND MANUFACTURE
     + - 1. Gauges of metal shall be as specified. No deviations or substitutions will be accepted.
         2. Reinforcing specified is the minimum acceptable. Provide additional reinforcement where required to ensure a permanent, rigid, trouble-free installation able to withstand the stresses of heavy commercial usage.
         3. Cut, shear, straighten and work the steel in manner to prevent disfigurement of the finished work.
         4. Punch frames for rubber door bumpers.
         5. Fill seams, joints and weld depressions with epoxy metal filler, disc sand to a smooth, flat, uniform scratch-free surface, with all arrises sharp and true to line. Drilled and punches holes shall be reamed and have all burrs removed.
         6. Finished work shall be free of warp, open seams, buckles, weld and grind marks and other surface defects detrimental to the production of a good paint finish.
         7. Fastenings shall be concealed except those required for loose glazing stops.
         8. Welding shall conform to CSA W59-03 (R2008).
         9. Hardware Requirements:

Blank, mortise, reinforce, drill, and tap doors and frames to receive templated hinges and other hardware as required. Check hardware lists for requirements.

* + - * 1. Frames:

Fabricate frames to profiles shown. Frames shall be fabricated to suite the header conditions of masonry work. Mitre corners of frames. Cut frame mitres accurately and weld continuously on inside of frame. Fabricate header frame to suit. Where site welding or splicing is required due to size of unit, the location of field joints shall be shown on the shop drawings and strictly adhered to.

Protect strike and hinge reinforcements and other openings with mortar guard boxes welded to frame.

Cutouts in doors for mortise lock sets shall be fitted with leaf spring clips and back limit stop to facilitate easy positioning and setting of locksets.

Weld floor clip angles to inside of each jamb profile, two holes in each for anchorage to floor. Where required provide adjustable type floor clip angles.

Fit frames with channel or angle spreaders, two per frame, to ensure proper frame alignment. Install stiffener plates or spreaders between frame trim where required, to prevent bending of trim and to maintain alignment when setting and during construction.

Where frames occur in masonry provide and adjustable T-strap type or wire type anchor for every 2'-0" of jamb length. Special anchors for frames to be set in concrete shall be as detailed.

Provide continuous weatherstripping at head and jambs of exterior door frames. Properly secure in place with screws and adjust as required.

Insulate exterior frames to provide continuous thermal barrier in exterior frames.

* + - * 1. Doors:

Fabricate doors to present one continuous face free from joints, tool markings and abrasions.

Reinforce, stiffen honeycomb doors with small cell honeycomb core laminated to the inside faces of panels. The core shall completely fill the inside hollow of the door.

Reinforce around frame openings required for glazing or louvers. Provide glazing stops with countersunk oval head screws.

Exterior doors shall be completely filled with polystyrene foam core.

Reinforce door edges with channel reinforcing. Bevel stiles 1/8". Assemble by tack welding and fill.

Provide flush top edge on exterior doors.

Provide cutouts in doors for glazed lites as indicated on Drawings and schedules. Glazing stops shall be square formed steel in single piece lengths sized to suit. Accurately mitre corners and finish in proper plane. Secure stops in place with flush, countersunk screws.

* + - * 1. Finishing:

Shop applies zinc rich primer to repair damaged zinc coatings arising from fabrication; cure primer fully before shipping to site; include compatible primer for site finishing and correction of surface abrasions to zinc coatings and factory applied primer.

Remove weld slag and splatter from exposed surfaces.

Fill and sand smooth tool marks, abrasions, and surface blemishes to present smooth uniform surfaces.

1. EXECUTION
   1. EXAMINATION
      * + 1. Examine substrates, door swing arcs, areas of installation and conditions affecting installation for compliance with requirements for manufacturer's installation tolerances and other conditions affecting performance of Work of this Section.
          2. Verify roughing-in for embedded and built-in anchor locations before installing frames.
          3. Verify door and frame size, door swing and ratings with door opening number before installing frames.
          4. Installation of hollow metal doors and frames will denote acceptance of site conditions.
   2. INSTALLATION
      * + 1. Install steel doors, frames, and accessories in accordance with reviewed shop drawings, ANSI A250.11, CSDMA Installation Guide, manufacturer's data, and as specified in this Section.
          2. Door Frames:

Remove temporary spreaders before installing door frames, leaving exposed surfaces smooth and undamaged.

Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set; limit of acceptable frame distortion 1.6 mm (1/16") out of plumb measured on face of frame, maximum twist corner to corner of 3 mm (1/8"); align horizontal lines in final assembly.

Brace frames rigidly in position until adjacent construction is complete; install wooden spreaders at third points of frame rebate to maintain frame width, install center brace to support head of frames 4' and wider in accordance with ANSI A250.1; do not use temporary metal spreaders for bracing of frames.

Install glazing materials and studded door silencers.

For frames over 1220 mm (4') in width, provide vertical support at the centre of head.

* + - * 1. Frame Tolerances: Install frames to tolerances listed in ANSI A250.11, and as follows:

Squareness: Maximum 0.8 mm (1/32") measured across opening between hinge jam and strike jamb.

Plumbness: Maximum 0.8 mm (1/32") measured from bottom of frame to head level.

Alignment: Maximum 0.8 mm (1/32") measured offset between face of hinge jamb and strike jamb relative to wall construction.

Twist: Maximum 0.8 mm (1/32") measured from leading edge of outside frame rabbet to leading edge of inside frame rabbet.

* + - * 1. Doors:

Fit hollow metal doors accurately in frames within clearances required for proper operation, shim as necessary for proper operation.

Install hardware in accordance with manufacturers' templates and instructions.

Adjust operable parts for correct clearances and function.

Install **[glazing materials and]** door silencers.

Install louvers and vents.

* + - * 1. Adjusting and Cleaning:

Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of airdrying primer compatible with factory applied primer, and as follows:

Clean exposed surfaces with soap and water to remove foreign matter before site touchup.

Finish exposed site welds to a smooth uniform surface and touchup with site applied rust inhibitive primer.

Sites apply touchup primer on exposed surfaces where zinc coating or factory applied primer has been damaged during installation or handling.

END OF SECTION