SECTION  – stell doors and frames

1. General
   1. SUMMARY
      1. This Section includes requirements for supply and installation of the following:
         1. Interior Steel Doors.
         2. Interior Steel Door Frames.
         3. Sidelight Frames.

SPEC NOTE: Remove the following if there is no Fire Rated Doors required on the project.

* + - 1. Fire rated door and frame assemblies.
  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):
        1. ANSI/SDI A250.7‑1997 (R2002), Nomenclature for Standard Steel Doors and Steel Frames.
        2. ANSI/SDI A250.11-2001, Recommended Erection Instructions for Steel Frames.
     2. American Society for Testing and Materials (ASTM):
        1. ASTM A653/A653M‑11, Standard Specification for Steel Sheet, Zinc‑Coated (Galvanized) or Zinc Iron Alloy‑Coated (Galvannealed) by the Hot‑Dip Process.
        2. ASTM A879/A879M-12, Standard Specification for Steel Sheet, Zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface.
        3. ASTM A924/A924M‑10a, Standard Specification for General Requirements for Sheet Steel, Metallic‑Coated by the Hot‑Dip Process.
     3. Canadian General Standards Board (CGSB):
        1. CAN/CGSB 1.132‑M90, Primer, Zinc Chromate, Low Moisture Sensitivity.
        2. CAN/CGSB 41‑GP‑19Ma‑78(1984), Rigid Vinyl Extrusions for Windows and Doors.
        3. CAN/CGSB 82.5‑M88, Insulated Steel Doors.
     4. Canadian Standards Association (CSA):
        1. CSA W59‑03 (R2008), Welded Steel Construction (Metal Arc Welding)
     5. Canadian Steel Door Manufacturers Association (CSDMA):
        1. Recommended Dimensional Standards for Commercial Steel Doors and Frames, 2007.
        2. Fire Labelling Guide, 2009.

SPEC NOTE: Remove the following two Paragraphs (NFPA & ULC) if there is no Fire Rated Doors required on the project.

* + 1. Underwriters Laboratories Canada (ULC):
       1. CAN4 S104‑M80 (R1985), Fire Tests of Door Assemblies.
       2. CAN/ULC S105‑09, Standard Specification for Fire Door Frames Meeting the Performance Required by CAN/ULC S104.
       3. CAN4 S106‑1980 (R1985), Standard Method for Fire Tests of Window and Glass Block Assemblies.
  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:
        1. Product Data:
           1. 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.
        2. Shop Drawings:
           1. Show each type of frame, door, hardware blanking, reinforcing, tapping, and drilling arrangements, metal gauges, thicknesses, and finishes.
           2. Show details of doors including vertical and horizontal edge details.
           3. 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.
        3. Samples:
           1. Supply for Consultant's review, if requested, sample of frame corner showing construction, workmanship, and finish.
        4. Informational Submittals: Provide the following submittals when requested by the Consultant:
           1. 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.
        5. Certificates: Submit the following certificates or letters of compliance:
           1. 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.
  2. QUALITY ASSURANCE
     1. Manufacturer: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer, and as follows:
        1. 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.
        2. Fabricator shall be a member in good standing of the Canadian Steel Door and Frame Manufacturer's Association.
     2. Supplier: Obtain hollow metal doors and frames from single source of supply and from a single manufacturer.
     3. 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.

SPEC NOTE: Remove the following if there is no Fire Rated Doors required on the project.

* + 1. Testing Agencies: Provide doors produced under label service program of a testing agency acceptable to Authorities Having Jurisdiction, and as follows:
       1. Steel Fire Rated Doors and Frames: Labelled and listed by an organization accredited by Standards Council of Canada for ratings specified or indicated.
       2. Provide fire labelled frame products for those openings requiring fire protection ratings, as scheduled:
          1. 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.
          2. Fabricate all rated doors, frames, and screens to labelling authority standard.
  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:
         1. Interior Doors and Frames (Normal Humidity): Electrolytic zinc coated steel sheets in accordance with ASTM A879/A879M-12, Commercial Steel (CS), Class B coating; mill phosphatized; suitable for unexposed applications; stretcher levelled standard of flatness.
      2. Gauges:
         1. Door and Screen Frames:
            1. Gauge: 16 msg
         2. Doors (Honeycomb or Polystyrene Core):
            1. Door Faces:

Gauge: 18 msg.

* + - 1. Top and Bottom End Channels:
         1. Gauge: 18 msg.
      2. Reinforcements:
         1. Lock and Strike Reinforcements:

Gauge: 16 msg.

* + - * 1. Hinge Reinforcements:

Gauge: 10 msg.

* + - * 1. Flush Bolt Reinforcements:

Gauge: 16 msg.

* + - * 1. Door Closer or Holder Reinforcements:

Gauge: 12 msg.

* + 1. Anchors:
       1. As required to suit condition.
    2. Rubber Bumpers:
       1. Three (3) per door.
    3. Interior Door Cores:
       1. Structural small cell; 1” maximum, kraft paper honeycomb; minimum weight 36 kg/ream; minimum density 16.5 kg/m3; sanded to required thickness.
    4. Adhesives:
       1. Core Adhesive: Heat resistant, single component adhesive recommended by manufacturer.
    5. 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.
    6. Accessories:
       1. Glazing Stops:
          1. Glass mouldings: Formed steel having 1/32” metal core thickness, screw fixed.
          2. Accurately fit and butt at corners glazing trim and stops; located on secure side of door, or interior of room window frame.
       2. Sealant: As specified in Section 07 92 00 – Joint Sealants.
       3. Glazing: As specified in Section 08 80 00 - Glazing.
       4. 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 are not acceptable.

SPEC NOTE: Remove the following if there is no Fire Rated Doors required on the project.

* + 1. Materials for fire rated doors shall conform to ULC or ULI requirements.
  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:
        1. Blank, mortise, reinforce, drill, and tap doors and frames to receive templated hinges and other hardware as required. Check hardware lists for requirements.
     10. Frames:
         1. 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.
         2. Protect strike and hinge reinforcements and other openings with mortar guard boxes welded to frame.
         3. 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.
         4. 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.
         5. 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.
         6. Where frames occur in masonry provide and adjustable T-strap type or wire type anchor for every 2' of jamb length. Special anchors for frames to be set in concrete shall be as detailed.

SPEC NOTE: Remove the following if there is no Fire Rated Doors required on the project.

* + - 1. Construct door frames of labelled fire doors as approved by ULC or ULI. Ratings for frames shall match doors. Locate label on the frame jamb midway between the top hinge and the head of door frame so that it is concealed when the door is closed.
    1. Doors:
       1. Fabricate doors to present one continuous face free from joints, tool markings and abrasions.
       2. 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.
       3. Reinforce around frame openings required for glazing or louvers. Provide glazing stops with countersunk oval head screws.
       4. Reinforce door edges with channel reinforcing. Bevel stiles 1/8". Assemble by tack welding and fill.

SPEC NOTE: Remove the following if there is no Fire Rated Doors required on the project.

* + - 1. Fabricate fire rated door assemblies in accordance with ULC or ULI requirements. Provide labels for all fire rated doors. Locate label on the door midway between the top hinge and the head of the door so that it is concealed when the door is closed.
      2. 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
       1. 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.
       2. Remove weld slag and splatter from exposed surfaces.
       3. 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:
         1. Remove temporary spreaders before installing door frames, leaving exposed surfaces smooth and undamaged.
         2. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set; limit of acceptable frame distortion 1/16” out of plumb measured on face of frame, maximum twist corner to corner of 1/8”; align horizontal lines in final assembly.
         3. Brace frames rigidly in position until adjacent construction is complete; install wooden spreaders at third points of frame rebate to maintain frame width, install centre 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.
         4. Install glazing materials and studded door silencers.
         5. For frames over 1220mm (4’) in width, provide vertical support at the centre of head.
      3. Frame Tolerances: Install frames to tolerances listed in ANSI A250.11, and as follows:
         1. Squareness: Maximum 0.8mm (1/32”) measured across opening between hinge jam and strike jamb.
         2. Plumbness: Maximum 0.8mm (1/32”) measured from bottom of frame to head level.
         3. Alignment: Maximum 0.8mm (1/32”) measured offset between face of hinge jamb and strike jamb relative to wall construction.
         4. Twist: Maximum 0.8mm (1/32”) measured from leading edge of outside frame rabbet to leading edge of inside frame rabbet.
      4. Doors:
         1. Fit hollow metal doors accurately in frames within clearances required for proper operation, shim as necessary for proper operation.
         2. Install hardware in accordance with manufacturers' templates and instructions.
         3. Adjust operable parts for correct clearances and function.
         4. Install glazing materials and door silencers.

SPEC NOTE: Remove the following if there is no Fire Rated Doors required on the project.

* + - 1. Install louvers and vents.
    1. Adjusting and Cleaning:
       1. Immediately after installation, sand smooth any rusted or damaged areas of prime coat and apply touch up of air‑drying primer compatible with factory applied primer, and as follows:
          1. Clean exposed surfaces with soap and water to remove foreign matter before site touch‑up.
          2. Finish exposed site welds to a smooth uniform surface and touch‑up with site applied rust inhibitive primer.
          3. Sites apply touch‑up primer on exposed surfaces where zinc coating or factory applied primer has been damaged during installation or handling.

END OF SECTION