SECTION 08110

HOLLOW METAL (STEEL) DOORS AND FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing steel doors, door frames, and associated accessories.

B. Related Sections:

1. Interior aluminum frames are specified in Section 08121.
2. Flush wood doors are specified in Section 08212.
3. Door hardware is specified in Section 08710.
4. Glass and glazing is specified in Section 08810.
5. Field-applied finishes are specified in Section 09900.

1.02 REFERENCE STANDARDS

A. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC).

1. LEED – NC v2.2 Reference Guide, first edition, dated December 2006.

1.03 SUBMITTALS

A. Refer to Section 01352 – LEED Requirements for LEED related submittal requirements.

B. Product Data: Furnish for each type of door and frame, including details of construction, materials, dimensions, hardware preparation, core, label compliance, profiles, and finishes.

1. Recycled Content: Furnish product data on post-consumer recycled content and post-industrial recycled content as a percentage of the full product composite.
2. Regional Materials: Furnish product data or letter stating the location (closest city, state) where product was manufactured (final processing or assembly) and, if available, the location where raw materials were harvested, extracted or recovered (mine, quarry, plantation, forest, recycling recovery center, etc.).

C. Shop Drawings: Include details of each frame type, elevations of door types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

D. Door Schedule: Furnish schedule of doors and frames using same reference numbers for details and openings as those on the drawings.

1.04 QUALITY ASSURANCE

A. Steel doors and frames shall comply with ANSI A250.8 "Recommended Specifications Standard Steel Doors and Frames" and the specified requirements.

B. Fire-Rated Door Assemblies: Units that comply with NFPA 80, are identical to door and frame assemblies whose fire resistance characteristics have been determined in accordance with ANSI/UL 10B and are labeled and listed by UL, Factory Mutual, Warnock Hersey, or other testing and inspecting organization acceptable to authorities having jurisdiction.

C. Steel doors and frames shall comply with positive pressure test requirements of UL 10C and shall be labeled accordingly by the door and frame manufacturer in a manner approved by authorities having jurisdiction.

1.05 ENVIRONMENTAL QUALITY ASSURANCE

A. Applicable LEED Credits – Refer to Section 01352:

1. Credit MRc4 – Recycled Content.

2. Credit MRc5 – Regional Materials.

3. Credit EQc4.1 – Adhesives and Sealants.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage.

B. Inspect doors and frames upon delivery for damage. Minor damage may be repaired provided finish items are equal to new work and acceptable to Architect; otherwise remove and replace damaged items as directed.

C. Store doors and frames at building site under cover. Place units on minimum 4-inch high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inch space between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Ceco Door Products, Curries Company, Stiles, Steelcraft or approved equal.

2.02 MATERIALS

A. Hot-Rolled Steel Sheets and Strip: Commercial quality carbon steel, pickled and oiled, complying with ASTM A569.

B. Cold-Rolled Steel Sheets: Commercial quality carbon steel, complying with ASTM A366, commercial quality or ASTM A620, drawing quality.

C. Galvanized Steel Sheets: Zinc-coated carbon steel complying with ASTM A526, commercial quality, or ASTM A642, drawing quality, hot dipped galvanized in accordance with ASTM A525, A60 or G60 coating designation, mill phosphatized.

D. Supports and Anchors: Fabricate of not less than 18-gauge, galvanized where used with galvanized frames.

E. Inserts, Bolts and Fasteners: Manufacturer's standard units. Where items are built into exterior walls, hot-dip galvanize in accordance with ASTM A153, Class C or D as applicable.

F. Shop Applied Primer: Rust-inhibitive enamel or paint, either air-drying or baking, suitable as a base for specified finish paints.

2.03 DOORS

A. Provide metal doors of ANSI A250.8 grades and models specified.

1. Interior Flush Doors: Grade II, heavy duty, Model 3, minimum 16-gauge cold-rolled sheet steel faces.

2. Interior Stile-and-Rail Doors: Grade III, extra heavy duty, Model 3, minimum 16-gauge cold-rolled steel sheet stiles and rails and minimum 18-gauge cold-rolled steel sheet flush panels.

3. Exterior Flush Doors: Grade III, extra heavy duty, Model 2, minimum 16-gauge galvanized steel faces.

4. Exterior Stile-and-Rail Doors: Grade III, extra heavy duty, Model 3, minimum 16-gauge galvanized steel sheet stiles and rails and minimum 18-gauge galvanized steel sheet flush panels. Provide louver panels where indicated.

B. Internal Construction: Manufacturer's standard honeycomb, polyurethane, polystyrene, unitized steel grid, vertical steel stiffeners, or rigid mineral fiber core with internal sound deadener on inside of face sheets where appropriate, in accordance with ANSI A250.8 requirements.

C. Clearance: Not more than 1/8-inch at jambs and heads, except not more than 1/4-inch between non-fire-rated pairs of doors. Not more than 3/4-inch at bottom.

1. Fire Doors: Provide clearances according to NFPA 80.

D. Edges:

1. General: Beveled latch stile for single doors, and meeting stile for pair doors; square elsewhere.

2. Stile Edges: No seams are allowed on vertical stile edges.

3. Top and Bottom Edges: Reinforced with 16-gauge steel channels; both edges flush and made watertight for exterior doors, top edge flush for interior doors.

E. Glazing: Provide minimum 20-gauge steel non-removable glazing stops on the outside of exterior doors and on the secure side of interior doors. Glazing beads on the inside of glass panels shall be removable.

F. Door Louvers: Sightproof stationary louvers, constructed of inverted V-shaped or Y-shaped blades formed of 24-gauge cold-rolled steel set into minimum 20-gauge steel frame. Provide with insect screens when used in exterior doors.

2.04 DOOR FRAMES

A. Provide metal frames for doors, transoms, sidelights, and mullions and other openings, of types and styles indicated. Conceal fastenings, unless otherwise indicated.

B. One-Piece Welded Frames: 14-gauge. Fabricate frames with mitered or coped and continuously welded corners.

C. Glazing Beads: Provide frame glazing beads in interior glazed openings and other locations where fixed glass is indicated. Prepare frames for the type of glazing beads required to receive the glass and gaskets indicated. Miter or butt join beads at corners. Glazing beads shall screw-on type.

D. Anchors:

1. Provide a jamb anchor for each 2'-6" of door or window height or fraction thereof.

2. Fabricate from minimum 16-gauge sheet steel.

3. Vary anchor types to provide positive fastening to adjacent construction.

4. Secure a metal clip angle at bottom of each jamb member for anchoring to floor, with a minimum of two fasteners.

5. Items to be built into exterior walls shall be hot-dip galvanized after fabrication in accordance with ASTM A153, Class B.

E. Door Silencers: Except on weatherstripped or smoke gasketed frames, drill stops to receive 3-silencers on strike jambs of single-swing frames and 2-silencers in heads of double-swing frames.

F. Plaster Guards: Provide 26-gauge steel plaster guards or mortar boxes at back of hardware cutouts.

G. Lower 18-inches of interior door frames and doors shall be coated with an anti-corrosive industrial epoxy coating as specified in Section 09900-2.01.B.

2.05 FABRICATION

A. Fabricate steel doors and frames to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at Project site. Comply with ANSI A250.8 requirements.

B. Fabricate exposed faces of doors, including stiles and rails of non-flush units, from cold-rolled steel.

C. Tolerances: Comply with SDI-117, "Manufacturing Tolerances Standard Steel Doors and Frames".

D. Fabricate frames, concealed stiffeners, reinforcement, edge channels, louvers and moldings from either cold-rolled or hot-rolled steel.

E. Fabricate exterior doors and frames and interior frames where scheduled from galvanized sheet steel. Close top and bottom edges of exterior doors as integral part of door construction or by addition of minimum 16-gauge inverted steel channels with channel webs placed even with top and bottom edges. Seal joints in top edges of doors against water penetration.

F. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

G. Hardware Preparation: Prepare doors and frames to receive mortised and concealed hardware in accordance with final door hardware schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A250.6 for door frame preparation for hardware.

1. For concealed overhead door closers, provide space, cutouts, reinforcing and provisions for fastening in top rail of doors or head of frames, as applicable.

H. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping of surface-applied hardware may be done at Project site.

I. Locate hardware as indicated on final shop drawings or in accordance with Door Hardware Institute (DHI) "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames".

J. Shop Painting: Clean, treat, and paint exposed surfaces of steel door and frame units, including galvanized surfaces.

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before application of paint.

2. Apply anti-corrosive industrial epoxy coating as per 2.04G.

3. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive paint finish.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General: Install steel doors, frames, and accessories in accordance with the manufacturer's instructions, the requirements of ANSI/SDI, and reviewed Shop Drawings.

B. Placing Frames: Comply with provisions of ANSI A250.8 and SDI-112 unless otherwise indicated. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.

1. Except for frames located in concrete, place welded frames before constructing enclosing walls or ceilings.

2. In masonry construction, install at least 3 wall anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Acceptable anchors include masonry wire anchors and masonry T-shaped anchors.

3. At concrete construction, install at least 3 completed opening anchors per jamb adjacent to hinge location on hinge jamb and at corresponding heights on strike jamb. Set frames and secure to adjacent construction with bolts and masonry anchorage devices.

4. In stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. Attach wall anchors to studs with screws.

5. Install fire-rated frames according to their listings.

C. Door Installation: Fit hollow metal doors accurately in frames, within specified clearances.

1. Fire-Rated Doors: Install with clearances specified in their listings.

2. Smoke-Control Doors: Comply with NFPA 105.

3.02 ADJUST AND CLEAN

A. Immediately after installation, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

1. Remove rust before touch-up is applied.

2. Touch-up shall not be obvious.

B. Repair damaged galvanizing with a high zinc dust content galvanizing repair paint.

C. When complete, exposed surfaces and edges shall be clean, straight, and free from dents, scratches, and other damage and defects.

D. Doors and finish hardware shall operate smoothly, quietly, and free from bind.

END OF SECTION

SECTION 08121

INTERIOR ALUMINUM DOORS AND FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing pre-finished interior aluminum doors, door frames, window frames, pass-thru windows and matching trim pieces.

B. Related Sections:

1. Painted hollow metal (steel) doors and frames are specified in Section 08110.
2. Flush wood doors are specified in Section 08212.
3. Exterior aluminum entrance doors are specified in Section 08412.
4. Door hardware is specified in Section 08710.
5. Glass and glazing are specified in Section 08810.

1.02 REFERENCE STANDARDS

A. Leadership in Energy and Environmental Design (LEED), www.usgbc.org/LEED (United States Green Building Council (USGBC).

1. LEED – NC v2.2 Reference Guide, first edition, dated December 2006.

1.03 SUBMITTALS

A. Refer to Section 01352 – LEED Requirements for LEED related submittal requirements.

B. Product Data: Manufacturer's specifications for fabrication and installation, including data substantiating products comply with specifications.

1. Recycled Content: Furnish product data on post-consumer recycled content and post-industrial recycled content as a percentage of the full product composite.
2. Regional Materials: Furnish product data or letter stating the location (closest city, state) where product was manufactured (final processing or assembly) and, if available, the location where raw materials were harvested, extracted or recovered (mine, quarry, plantation, forest, recycling recovery center, etc.).

C. Shop Drawings: Include details of each door and frame type, elevations, conditions at openings, details of construction, location and installation requirements of reinforcements, and details of joints and connections. Show anchorage and accessory items.

D. Samples: Furnish samples of each type and color of aluminum finish on 12-inch long sections of extrusions. Where normal color variations are to be expected, include two or more samples in each set showing limits of variation.

1.04 QUALITY ASSURANCE

A. Fire-Rated Assemblies: Provide fire-rated frames identified with UL, Warnock Hersey or other label approved by authorities having jurisdiction, indicating applicable fire-ratings. Construct and install assemblies to comply with NFPA Standard No. 80.

1.05 ENVIRONMENTAL QUALITY ASSURANCE

A. Applicable LEED Credits – Refer to Section 01352:

1. Credit MRc4 – Recycled Content.

2. Credit MRc5 – Regional Materials.

3. Credit EQc4.1 – Adhesives and Sealants.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver aluminum doors and frames packaged or crated to provide protection during transit and job storage.

B. Inspect aluminum doors and frames upon delivery for damage. Minor damage may be repaired provided finish matches adjacent finishes as determined by the Architect.

C. Store doors and frames under cover in accordance with manufacturer's recommendations.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. Wilson Partitions or approved equal.

2.02 ALUMINUM FRAMES

A. Aluminum Extrusions: Alloy and temper recommended by manufacturer. Main frame members shall have a nominal wall thickness of 0.062-inch; frame and hinge anchorage areas shall be 0.130-inch thick.

B. Fasteners: Screws, nuts, washers and similar fasteners shall be aluminum, stainless steel or other non-corrosive material compatible with aluminum. Exposed fasteners are not acceptable.

C. Glazing Gaskets: Manufacturer's standard vinyl gaskets.

D. Fabricate aluminum frames at manufacturer's shop prior to application of finish; profiles and shapes as indicated.

E. Fabricate frames for attachment to partitions with concealed fasteners.

F. Provide steel attachment clips for extrusion intersections.

G. Fabricate frames to permit installation over prefinished walls.

H. Provide continuous nylon backed wool pile sound and light-seal around perimeter of door stops.

I. Prepare aluminum door frames to receive hardware from reviewed hardware schedule, hardware templates, and hardware samples furnished by hardware supplier. Include reinforcements as required. Drill and tap mortised reinforcements at factory.

J. Provide matching sidelight frames where indicated.

K. Provide matching aluminum wall trim where indicated.

2.04 ALUMINUM DOORS

A. Flush Doors:

1. Doors shall be constructed with tubular aluminum jamb rails and tubular grid sections with smooth 0.090-inch thick face sheets. Doors edges shall not be capped with channel moldings.

2. At the top and bottom of each door there shall be an internal tubular section. The doors shall have an internal grid system comprised of tubular sections positioned horizontally no less than 24-inches on center. The perimeters of all cut-outs shall be reinforced with this section. Internal members shall be anodized for corrosion protection.

3. Voids between tubular rails and grid sections shall be filled with a rigid, compressed high density mineral insulation have a flame spread rating of 25 when tested in accordance with ASTM E84.

4. Door hinge and lock rails shall be assembled with horizontal and vertical grid sections attached with concealed interlocking aluminum channel clips. The clips shall be secured to the jamb rails by an integral "T" slot on the jamb rails and shall be pinned to the rails with stainless steel screws. The grid sections shall slip over the clips and shall be attached to the clips with stainless steel screws. The face sheet shall be bonded to the rim, grid sections and insulated core with a thermal-setting epoxy adhesive.

5. Doors shall be reinforced to receive door hardware with 6061-T6 aluminum alloy extrusions, not less than .250-inch thick. Wooden block reinforcements are not acceptable.

B. Stile-and-Rail Doors:

1. Construction: Aluminum heavy duty tubular doors. Doors shall be constructed from 6063-T5 alloy with .125-inch minimum thickness and shall be fabricated with 3/8-inch plated steel thru bolts in rails. Lock stile shall have integral bevel edge of 1/8-inch over two inches with a wool pile weather strip seal. Exposed fasteners shall be stainless steel.

2. Glazing: As scheduled, held in place with snap-in, non-removable stops of extruded aluminum. Vinyl inserts shall be used for sealing. No exposed fasteners.

3. Hardware Preparation: Prepare doors to receive door hardware as specified in Section 08710.

2.05 ALUMINUM PASS-THRU WINDOWS

A. Window Type: Bi-parting horizontal sliding with glass lock.

2.06 FINISHES

A. Exposed surfaces shall be free of scratches and other serious blemishes.

B. Aluminum shall be finished in a clear anodized finish unless otherwise indicated.

PART 3 - EXECUTION

3.01 INSPECTION

A. Examine substrate and conditions under which aluminum door and frames are to be installed. Do not begin installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install aluminum doors and frames in accordance with manufacturer's instructions and reviewed shop drawings.

B. Securely anchor frames straight, plumb and level without distortion.

C. Corners shall be accurately joined, reinforced and fitted to flush hairline joints.

D. Install fire-rated frames in accordance with NFPA Standard No. 80.

3.03 ADJUST AND CLEAN

A. When complete, aluminum doors and frames shall be clean, straight and free from dents, scratches and other damage and defects.

B. Clean aluminum doors and frames using materials and methods recommended by manufacturer.

END OF SECTION