

08110 STEEL DOORS AND FRAMES

SPECIFIER:

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PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Steel doors and frames including necessary accessories.
- B. Section Does Not Include: Use of aluminum doors.
- C. Related Sections:
 - 1. 04221 - Concrete Unit Masonry.
 - 2. 04530 - Masonry Patchwork.
 - 3. 06100 - Carpentry.
 - 4. 07900 - Joint Sealers.
 - 5. 08710 - Door Hardware.
 - 6. 09200 - Metal Studs, Lath, Suspension Ceiling, Plaster, and Stucco.
 - 7. 09900 - Painting of Unpainted Surfaces.

1.2 REFERENCES

- A. American Society for Testing and Materials (ASTM), latest edition:
 - 1. A653 Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. A924 Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
 - 3. C270 Specification for Mortar for Unit Masonry.
- B. Factory Mutual (FM), latest edition.
- C. National Builders Hardware Association - "Recommended Locations for Builders", latest edition.
- D. Steel Door Institute (SDI), latest editions.
 - 1. SDI 100 Standard Steel Doors and Frames.
 - 2. SDI 105 Recommended Erection Instructions for Steel Frames.
 - 3. SDI 107 Hardware on Steel Doors (reinforcement application).
- E. Underwriters Laboratories (UL), latest edition.
- F. UL 1784 Air Leakage Test of Door Assemblies.
- G. National Fire Protection Association (NFPA), latest edition:

1. NFPA 80 Standard for Fire Doors and Windows.
 2. NFPA 101 Life Safety Code.
 3. NFPA 105 Smoke and Draft Control Assemblies.
- H. Florida Department of Education, Office of Educational Facilities - State Requirements for Educational Facilities - 1999 (SREF).
- I. Florida Building Code (FBC).
- J. Americans with Disabilities Act and Accessibility Guidelines (ADA).
- K. American National Standards Institute (ANSI), latest edition:
1. A250.4 Test Procedure and acceptance criteria for physical endurance, steel doors and frames.
 2. A224.1 Test Procedure and acceptance criteria for prime painted steel surfaces for steel doors and frames.
 3. A117.1 Accessible and Usable Buildings and Facilities.
- L. Warnock Hersey International (WHI), Division of Inchcape Testing Services.

1.3 SUBMITTALS

- A. Exterior Door Certification: Miami-Dade County Notice of Acceptance (NOA) or State of Florida Product Approval. Provide calculations signed and sealed by a Florida registered Professional Engineer demonstrating compliance with FBC and ASCE 7 missile impact requirements.
- B. Submit properly identified product data including manufacturer's specifications and installation instructions before starting work, and any information necessary to indicate compliance to these specifications.
- C. Shop Drawings:
1. Indicate manufacturer's M-DCPS model number, door and frame elevations and sections, materials, gauges and finishes, fabrication and erection details, locations of finish hardware by dimension and locations/details of all openings and louvers. Do not proceed with any fabrication until all details are approved by A/E.
 2. Provide shop drawings for louver kits and light kits.
- D. Upon request, submit nonreturnable samples necessary to be evaluated for construction compliance.
- E. Label Construction Certification: For door assemblies required to be fire-rated and exceeding sizes of tested assemblies, submit manufacturer's certification for each door and frame assembly constructed to conform to design, materials, and construction equivalent to requirements for labeled construction.

1.4 QUALITY ASSURANCE

- A. Fire-Rated Door Assemblies: Where fire-rated door assemblies are indicated or required, provide fire-rated door and frame assemblies complying with NFPA 80 and have been

tested, listed, and labeled according to UBC-43-2 and ISO-3008 by a nationally recognized independent testing and inspection agency.

- B. Provide doors and frames complying with SDI 100 and as specified.
- C. M-DCPS reserves the right to cut open, at no cost to the board, a random door to verify construction and reinforcements for compliance with M-DCPS previously accepted manufacturer's shop drawings. Non-Compliance will be grounds for removal and replacement of installed door at no expense to the Board.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver steel doors and frames cartoned or crated to provide protection during transit and job storage. Provide additional sealed plastic wrapping for factory finished doors.
- B. Inspect steel doors and frames upon delivery for damage. Minor damage may be repaired if refinished items are equal in all respects to new work and acceptable to A/E. 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 that could create a humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4" spaces between stacked doors to promote air circulation.
- D. Deliver all doors and frames to the jobsite in a timely manner to not delay progress of other trades.

1.6 WARRANTY

- A. Hollow metal doors and frames shall be supplied with a 1 year warranty against defects in materials and construction.
- B. Warranty shall begin on date of substantial completion of the project.

1.7 DEFINITIONS

- A. Areas subject to wet mopping include kitchens, dining rooms, toilets, locker/showers, custodial, and other similar spaces with hard or resilient flooring.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Steel Doors and Frames: Steel doors referenced below are "stock" models which shall be modified by appropriate manufacturer as may be necessary to meet all the requirements stated in this document.
 - 1. Model MS Medallion by Ceco Door Products, Carol Stream, IL.
 - 2. Model 747 by Curries Company, Mason City, IA.
 - 3. Model M-DCPS Spec Door by Next Door Distribution, Miami, FL.
 - 4. Model "H" Series by Flemming.
 - 5. Model F-16 by Quality Engineered Products Co., Inc., Tampa, FL.

6. Model "B" Series by Steelcraft, Cincinnati, OH.
7. Model DE416 by Republic Builders Products, Pembroke Park, FL.

2.2 DOORFRAMES

- A. Fabricate exterior frames and interior frames to profiles indicated of 16-gauge hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq.ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
- B. Frames: Fully welded with mitered or butted head and jamb members with integral stops and with combination buck and trim as shown.
 1. Corners shall have continuous flush and smooth welds without dishing.
 2. Sanitary or hospital type stops shall have 6-inch high cutoffs with 45-degree caps.
- C. Hardware Reinforcements and Preparations:
 1. Frames shall be mortised, reinforced, and drilled/ tapped for mortised hardware according to approved finish hardware schedule and templates by hardware supplier.
 - a. Drilling and tapping for surface applied hardware shall be done in the field.
 - b. Locate finish hardware according to "Recommended Locations for Builder's Hardware" published by National Builders Hardware Association, SREF, or as otherwise directed by A/E.
 2. Butt (Hinge) Reinforcing:
 - a. Steel plate 3/16" thick by 1-1/4" minimum to 1-1/2" maximum by 10 inches long, offset as required to have faces of butts flush with doorframe edge and secured by not less than 6 spot welds.
 3. Strike Reinforcement: Offset clips of 12-gauge steel, 1-1/4" x 4-7/8" long.
 4. Closer Shoe Reinforcing for Parallel Arm:
 - a. 12-gauge steel plates (minimum 20" long x 1-3/4" wide) at bottom of doorstop located next to door rabbet on hinge.
 - b. Provide styrofoam or treated wood over plates to allow closer foot screws to seat without interference from grout fill.
- D. Silencer (Mute) Provisions: Punch frames to receive silencers on strike jamb scheduled in Section 08710.
- E. Center Hardware Mullions, Removable: Grout filled and fabricated with only one thickness of metal occurring at point of silencer punch-outs, 2" x 3", 11-gauge hardware mullion by exit device manufacturer.
- F. Grout:
 1. Grout Guards:
 - a. Provide 26-gauge sheet metal covers welded to the back of frames at hinges, lock, bolts, tapped reinforcements at hardware and silencer locations.

- b. At Silencer locations, furnish suitable removable plugs in holes to keep grout free.
 - 2. Coatings:
 - a. Provide full coverage at frame interior before grouting with corrosion inhibiting bituminous coating.
 - 3. Grouting of Frames:
 - a. Grout fill-in-place doorframes at the following locations:
 - 1) All exterior door openings,
 - 2) All door openings in masonry, concrete and tilt-wall construction.
 - 3) Other areas as indicated on the Construction Documents.
 - b. Grout shall be a mortar mix complying with ASTM C270, Type S-1800 psi minimum.
 - G. Jamb Anchors: Provide according to frame manufacturer's recommendations for attachment to masonry walls, concrete columns, and metal stud system as shown on drawings.
 - H. Floor Anchors: Provide 14-gauge galvanized sheet steel angle shaped anchors for each jamb extending to the floor, punched for not less than two 1/4" diameter bolts.
 - I. Spreaders: Provide frames with temporary steel spreader bars tack welded to jambs to maintain full rigidity and proper alignment during installation.
 - J. Security Switch Preparation: Refer to the Drawings and M-DCPS Design Criteria Appendix.
- ### 2.3 HOLLOW METAL DOORS
- A. Fabricate exterior and interior doors to profiles indicated of 16-gauge hot-dip zinc-iron alloy coated sheet steel, A366, with A60 coating designation according to ASTM A924 and ASTM A653 0.50 oz. zinc per sq. ft. total both sides. Steel shall be of commercial quality, stretcher leveled flatness.
 - B. Types: Flush, seamless hollow construction with louvers or vision cutouts as shown or specified.
 - C. Sizes and Thickness: Sizes shall be as indicated and with 1-3/4" thickness unless otherwise specified or shown.
 - 1. Provide undercuts where indicated for ventilation. Do not exceed 3/4" undercut for fire labeled doors.
 - 2. Provide 3/8" undercut at doors for exterior openings with ADA threshold.
 - D. Door Perimeters:
 - 1. Stile Edges: Bevel for single acting doors shall be 1/8" in 2 inches.
 - 2. Reinforcing: Refer to the Drawings and M-DCPS Design Criteria Appendix.
 - 3. Top and Bottom Channels.

- a. Not less than 16-gauge A60 zinc coated steel channels-flush or inverted.
- b. Welded to the face sheets.
- c. Exterior door tops shall have flush surface.

E. Doors:

1. Classification: SDI Grade III - Model 2, 16-gauge, seamless, and steel stiffened with M-DCPS required reinforcement and as shown on Drawings.
2. Doors shall have minimum 20-gauge, continuous one-piece, vertical steel stiffeners spaced not to exceed 6 inches apart and welded at 6 inches on center to face skin.
3. Lock Rail shall be one-piece, full height minimum 16-gauge channel.
4. Hinge Rail Reinforcement Manufacturer's Option:
 - a. One-piece, full height, 12-gauge channel formed, and tapped for hinges.
 - b. One-piece, full height, minimum 16-gauge channel formed and with minimum 3/16" thick steel by minimum 8" long at each hinge.
5. Cylindrical Lock Reinforcement: Minimum 16-gauge standard hardware lock box.
6. Exit Device Reinforcement: Minimum 12-gauge channel or box, minimum 20" long by 4" wide on both sides of door.
7. All spaces between stiffeners shall be insulated with fiberglass or mineral insulation.
8. Door closer reinforcement shall be minimum 12-gauge channel or box, welded to top channel. Bottom of reinforcement shall be a minimum of 5-3/4" from top of door, by width of door.
9. Astragals: Flat security type or "Z" as indicated in drawings or specifications.
10. All doors shall comply with ANSI A250.4-1994 Level "A" criteria and be tested to 1,000,000 operating cycles and 23 twist tests.
 - a. Certification of Level "A" doors shall be submitted with approval drawings by the distributor.
 - b. Do not bid or supply any type or gauge of door not having been tested and passed this criteria.

F. Core material.

1. Stiffeners: Provide vertical members spaced not more than 6 inches o.c. with shape standard to manufacturer.
2. Core Fill: Provide fiberglass or mineral standard to manufacturer.

G. Hardware Reinforcements and Preparation:

1. Hardware Reinforcement: Comply with M-DCPS accepted manufacturer's drawings.
2. Hardware preparation.
 - a. Drill for hardware according to accepted finish hardware schedule and templates furnished by hardware supplier.
 - b. Drilling and tapping for surface applied hardware shall be done in the field.
 - c. Locate finish hardware according to recommended locations for hardware as shown on drawings.
 - d. Through bolts for exit devices and locksets shall be by manufacturer.
 - e. Lock reinforcement shall be located as height required for standard and disabled users as shown on drawings and as specified.

H. Security Switch Preparation: Refer to Drawings.

I. Exterior Door Louvers:

1. Zee profile weather resistant type equal to thickness of door, with center rail and of sizes indicated.
2. Fabricate frames and louvers of 18-gauge bonderized electro zinc coated sheet steel.
3. Weld or secure frame and louvers into doors without use of screws or through bolts visible from the secured side.
4. Provide security grille as specified on inside of louvers.
5. At louver opening cutout, provide minimum of 20-gauge zinc coated steel channel closure welded at opening perimeter.

J. Interior Door Louvers:

1. Inverted "Y" profile sightproof type equal to thickness of door, of sizes indicated.
2. Fabricate frames and louvers of 18-gauge bonderized electro zinc coated sheet steel.
3. Weld frame and louvers into doors without use of screws or through bolts visible from the secured side.
4. Provide security grille as specified on inside of louvers.
5. At louver opening cutout, provide minimum of 20-gauge zinc coated steel channel closure welded at opening perimeter.

K. Fire Door Louvers: Provide UL or FM labeled assemblies of sizes indicated, subject to the following:

1. Louver maximum size limited to 24 inches height and width.
2. Louver minimum size limited to 6 inches high and 12 inches wide.
3. Secure double louver frames to doors with sex bolts through door at 12 inches o.c. maximum.
4. Provide security grille as specified on inside of louvers.

L. Security Grilles:

1. Able to withstand a 200-pound force applied to any point from any direction.
2. A60 galvanized steel, minimum 1/16" thick, with 0.125" dia. holes stagger 0.1875" to provide 40 percent open area. Powder coat finish. Color to be selected by A/E.
3. Manufacturers:
 - a. Crime Shield Barriers by Exeter, Wyoming, PA.
 - b. Security Barrier Screens by Phoenix, Lawrenceville, GA.
 - c. Securiperf Security Screens by Security Sales Company, Miami, FL.

M. Security Grilles - Missile Impact Resistant:

1. Certified missile impact resistant.
2. 14-gauge A40 galvanized steel, with 50 percent minimum open area. Powder coat finish. Color to be selected by A/E.
3. Manufacturers:
 - a. Storm Shield Barriers by Exeter, Wyoming, PA.
 - b. SureGuard Hurricane Barriers by Phoenix, Lawrenceville, GA.

N. Insect Screens for Exterior Door Louvers:

1. 18 x 16 mesh aluminum screen on rewireable extruded aluminum frame.
2. Mount screen on interior of exterior doors with zinc plated sheet metal screws at 12 inches o.c.

O. Rat Screens for Exterior Door Louvers:

1. 1/4" mesh hot dipped galvanized steel hardware cloth secured in 16-gauge bonderized hot dipped zinc coated steel "U" frames.
2. Mount screens on interior of exterior doors with zinc plated sheet metal screws at 12 inches o.c.

P. Interior Lightproof Door Louvers:

1. Interlocking channel lightproof type, equal to thickness of door, of sizes indicated.
2. Fabricate frames and louvers of 18-gauge bonderized electro zinc coated sheet steel.
3. Weld or secure frame and louvers into doors without use of screws or through bolts visible from the secured side.

Q. Slip-on Spats: 20-gauge, #4 satin finish.

R. Light Opening in Doors:

1. Provide light openings of sizes indicated.
2. At light opening cut outs, provide 16-gauge zinc coated steel channel closures welded into opening perimeter.

S. Glass light frames in doors fabricated of not less than 18-gauge galvanized steel with attachment screws allowed only on the non-secure side, not visible when viewing door lite frame face.

2.4 FINISHING AND SHOP PAINT

- A. After Fabrication: Grind exposed weld marks smooth and flush, clean and degrease surfaces, apply metallic filler, sand smooth, and apply shop coat of manufacturer's standard rust-inhibitive metal primer baked on.
- B. Prime Coat: Thoroughly cover all surfaces to provide uniform dry film thickness of not less than 1.0 mil without runs, smears, or bare spots.
- C. Primer Coat: Use manufacturer's standard rust inhibiting primer complying with ANSI A-224.1-1990.

PART 3 EXECUTION

3.1 INSPECTION

- A. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.2 INSTALLATION

A. Frames:

1. Install plumb, level, and true to line, secured in openings.
2. Install frames according to accepted shop drawings, manufacturer's printed instructions.
3. Grout fill-in-place all doorframes at exterior doors, doors located in masonry, concrete and tilt-wall construction, and at other areas as indicated in the Construction Documents.
4. Install fire-rated frames according to NFPA 80.
5. Install stainless steel slip-on spats at food service doorframes.

B. Doors:

1. Install in openings plumb, level, and true to line.
2. Apply hardware and adjust to achieve smooth and quiet operation.
3. Install insect/rat screens on interior of exterior door louvers.
4. Place fire-rated doors with clearances as specified in NFPA 80.

3.3 ADJUST AND CLEAN

1. Prime Coat Touch-Up: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.
2. Protection Removal: Immediately before final inspection, remove protective plastic wrappings from prefinished doors.
3. Fill all dents, holes, etc. with metal filler and sand smooth flush with adjacent surfaces-paint to match.
4. Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition. Provide final adjustment as follows:
5. Door Contact With Silencers: Doors shall strike a minimum of two silencers without binding lock or latch bolts in the strike plate.
6. Head, Strike, and Hinge Jamb Margin: 1/8".
7. Meeting Edge Clearance, Pairs of Doors: $\pm 1/16$ ".
8. Bolts and Screws: Leave tight and firmly seated.
9. Soundseal gasketing.
10. Vermin Protection:
 - a. Drop Seal: Full contact with no gaps.
 - b. Brush weatherstripping.

END OF SECTION