	Title: YALE OFFICE OF FACILITIES PROCEDURE MANUAL Chapter: 01 - Yale Design Standard Division: 08 00 00 Openings	Section: 08 10 00 Requirements for Steel Doors and Frames
		Date: December 2023
		Author: Office of Facilities

PART 1 - INTRODUCTION

1.1 PURPOSE

This section contains general design criteria for steel doors and frames

PART 2 - GENERAL DESIGN REQUIREMENTS

2.1 SYSTEM DESIGN AND PERFORMANCE REQUIREMENTS


Whenever possible, door sizes, frame sizes, and details must conform to stock industry standards. Use custom sizing and detailing only to match existing conditions or as necessary for specific functional needs. In general, nominal door dimensions must be 3' x 7' x 1-3/4".

A. Frame Construction

1. Steel frame facings must be a standard 2" for such elements as doors, transoms, sidelights, and borrowed lights. Other approved frame sizes must match existing conditions or respond to specific functional requirements.
2. Interior door frames must be 16 gauge. Exterior door frames must be 14 gauge and galvanized.
3. Frames must be one-piece, fully welded, with mitered corners and stops. Grind exposed surfaces smooth, with no joints anywhere on the frame.
4. Removable glazing stops must be located on the secure side of controlled access openings and must be prepared for countersink style, tamperproof screws.
5. Frames must be reinforced as necessary for required hardware.
6. Exterior door frames shall be thermally broken.

B. Frame Mortises and Reinforcement

1. Frames must be mortised, reinforced, drilled, and tapped for all mortise hardware, using templates provided by the hardware supplier.
2. Dimensions for steel reinforcements welded to frames:
 - Hinge and pivot reinforcements must be 3/16" x 1-1/2" x 9"
 - Closers and holders must be 12 gauge x 14" x frame width
 - Floor clips must be 16 gauge x 3-1/2"
3. Provide mortar-tight, full enclosure steel cover boxes over all mortises.

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C. Frame Anchors

Provide at least three anchors at each jamb. Use anchor types appropriate for the wall construction.

D. Doors Construction

1. Construction standards for interior, non-fire rated steel doors:

- 1-3/4" thick
- Seamless flush doors
- SDI-100 Grade II
- Minimum 18-gauge, cold-rolled steel sheet, with honeycomb core material

2. The core material for fire rated doors shall be per manufacturer's fire label requirements. Options include and shall be verified with each door manufacturer: Honeycomb (up to 3 hr), Polyurethane (up to 3 hr), Polystyrene or Steel stiffened (up to 3 hr)

3. Construction standards for exterior doors:

- 1-3/4" thick
- Seamless flush doors
- SDI-100 Grade III
- Minimum 16-gauge, zinc-coated, galvanized steel sheet, with a polystyrene or polyurethane core
- Minimum U-value of .24
- Top edge closed flush
- All doors with glazing shall be factory glazed.

E. Door Mortises and Reinforcement


1. Doors must be mortised, reinforced, drilled, and tapped for all mortise hardware, using templates provided by the hardware supplier.

2. Dimensions for steel reinforcements welded to frames:

- Hinge and pivot reinforcements must be 3/16" x 1-1/2" x 9"
- Closers and holders must be 12-gauge x 3-1/2" x 14"

3. Provide reinforcements, as required, to receive surface-mounted hardware.

4. Removable stops in doors for glazing or louvers must be located on the secure side of the door.

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F. Fire-Rated Doors and Frames

Fire-rated doors and frames must be constructed in accordance with the current edition of Underwriters Laboratories, Inc. They must bear the appropriate permanent labels and may only be modified in the field by certified personnel.


G. Finishing

Doors and frames must be thoroughly cleaned and prepared to receive a baked-on, rust-inhibitive primer. Provide all doors factory finished.

2.2 SUBMITTALS

Shop drawings must include a schedule of doors and frames indicating:

- Gauge
- Configuration
- Fire-label
- Anchor types and spacing
- Location of cut-outs for hardware and reinforcement
- Door elevations
- Hardware group
- Core material
- Internal reinforcement
- Closure method
- Cut-outs for glazing or louvers

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2.3 PRODUCT STANDARDS

Products must conform to the following standards:

- ANSI A224.1 – Test Procedure and Acceptance Procedure for Prime Painted Steel Surfaces
- ASTM A366 – Steel Carbon, Cold-Rolled Sheet, Commercial Quality
- ASTM A525 – General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
- ASTM A526 – Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality
- ASTM E152 – Methods of Fire Tests of Door Assemblies
- DHI (Door Hardware Institute)
- NFPA 80 – Fire Doors and Windows
- NFPA 252 – Fire Tests for Door Assemblies
- SDI-100 – Standard Steel Doors and Frames
- SDI-105 – Recommended Erection Instructions for Steel Frames
- UL 10B – Fire Tests of Door Assemblies
- UL 10C – Standard for Positive Pressure Fire Tests of Door Assemblies

2.4 MANUFACTURERS

Subject to compliance with the design requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:


- Amweld Building Products
- Ceco Corporation
- Curries Manufacturing
- Republic Builders Products Corporation
- Steelcraft Manufacturing
- Equal SDI Member, as approved by Yale University

2.5 ACCESSORIES OR SPECIAL FEATURES

Provide resilient rubber silencers.

2.6 SPECIAL REQUIREMENTS

Maintain a maximum diagonal distortion of 1/16" from corner to corner.

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2.7 INSTALLATION GUIDELINES

- A. Install frames in accordance with SDI-105.
- B. Install doors in accordance with DHI publication, —The Installation of Commercial Steel Doors and Steel Frames, Insulated Steel Doors in Wood Frames, and Builders Hardware.!
- C. Install fire-rated doors and frames in accordance with NFPA 80.

2.8 CLEANING AND ADJUSTING

Adjust hardware for smooth and balanced door operation.

Date	Description of Change	Pages / Sections Modified	ID
12/12/23	Template update	-	Office of Facilities