

MIT

Design Standards

DIVISION 08 — Openings

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Department
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1. 081110 - HOLLOW METAL DOORS AND FRAMES

1.1 Project Includes

Hollow metal doors and frames at interior and exterior.

1.2 Quality Assurance

General Standards:

1. ANSI/SDI 100, Recommended Specifications for Standard Steel Doors and Frames.

Performance Standards:

1. Fire Rated Assemblies: NFPA 80, and acceptable testing agency listing.
2. Thermal Rated Assemblies at Exterior: ASTM C236 or ASTM C976.
3. Sound Rated Assemblies at Mechanical Rooms: ASTM E90, and ASTM E413.

1.3 Products

Steel Doors:

1. Door Type: Standard steel doors with composite construction.
2. Interior Doors: ANSI/SDI 100, Grade II, heavy duty, minimum 16 gage cold rolled steel, 1-3/4 inches thick, seamless.
3. Exterior Doors: ANSI/SDI 100, Grade III, extra heavy duty, minimum 16 gage galvanized sheet steel, 1-3/4 inches thick, seamless.
4. Accessories: Sightproof stationary louvers and glazing stops.
5. Finish: Factory primed and field painted.

Steel Frames:

1. Interior Frames: Welded, 16 gage sheet steel, mitered or coped corners.
2. Exterior Frames: Welded, 14 gage galvanized steel, mitered or coped corners.
3. Accessories: Door silencers and plaster guards.
4. Finish: Factory primed and field painted.

MIT Main Group Buildings, Steel Doors and Frames:

1. Interior Doors: 1-3/4 inch thick, flush, heavy duty, 18-gage, minimum 0.042 inch steel faces, with a minimum STC rating of 32.
2. Interior Frames: 16-gage, 0.053 inch thick.

3. Exterior Doors: 1-3/4 inches thick, seamless, extra heavy duty, 16-gage, 0.058 inch thick A60 galvanized steel faces, with a minimum core R-value of 6.25,
4. Exterior Frames: 14-gage, 0.067 inch thick, with an A60 zinc coating.

2. 081210 - INTERIOR METAL FRAMES

2.1 Project Includes

Interior glazed aluminum framing system, typically at offices and conference rooms.

Interior glazed steel frames, typically at Main Building Group.

2.2 Sustainable Design

Provide interior aluminum frames with the following sustainable design features:

1. Recycled content.
2. Low VOC adhesives and sealants.

2.3 Products

Aluminum: Extruded aluminum, ASTM B221.

Glass and Glazing: Tempered glazing typical.

Finish: Clear anodized typical.

Auxiliary Materials:

1. Door hardware, including silencers.
2. Glazing stops and sealants.

NOTE: Door stiles to be 5 inch “rugged rail” on any doors requiring locksets or exit devices.

MIT Main Group Buildings, Interior Steel Framed Partitions:

1. Steel Framing: Hope's 5000 Series and Landmark Series, black powder-coated finish.
2. Glazing: 5/16 inch laminated glass, frosted or clear interlayer.
3. Glazing Film: 3M Dusted Crystal.

3. 081400 - WOOD DOORS

3.1 Project Includes

Wood doors:

1. Interior flush wood doors.
2. Interior stile and rail wood doors.

3.2 Sustainable Design

Provide wood doors with the following sustainable design features:

1. Recycled content, wood door cores.
2. FSC certified wood.
3. Low VOC adhesives and sealants.
4. No added urea-formaldehyde.

3.3 Quality Assurance

Quality Standards: NWWDA I.S. 1A, and AWI Architectural Quality Standards.

Fire Rated Wood Doors: Meeting ASTM E152 requirements.

3.4 Products

Grade: AWI Custom grade for transparent finish typical.

Core: Solid core.

Thickness: 1-3/4 inch.

Construction: 5 ply construction with particleboard core.

Wood Species and Cuts for Transparent Finish: Match building standard where applicable, select for new applications.

Accessories: Glazing stops and intumescent seals.

Hardware: Factory-fitted.

Finish: AWI Premium grade, catalyzed lacquer.

MIT Main Group Buildings, Exterior Monumental Doors:

Door Thickness: 2-3/4 inches.

Veneer: African Mahogany (*Khaya ivorensis*), Plain Sliced, WDMA Industry Standard, “A” Grade veneer minimum 1/50 inch (0.6 mm) thick, mechanically splice species wood, cut with book matched grain, end matched transoms.

4. 083110 - ACCESS DOORS AND PANELS

4.1 Project Includes

Access doors for walls and ceilings.

4.2 Products

Access Doors:

1. Frames: 16 gage sheet steel with flange suitable for adjacent material.
2. Doors: 14 gage sheet steel.
3. Door Type: Flush panel.
4. Locking Devices: Cylinder locks, keyed alike.

5. 083300 - COILING DOORS AND GRILLES

5.1 Project Includes

Coiling doors and grilles:

1. Overhead coiling doors.
2. Fire shutters.
3. Overhead coiling counter doors.
4. Overhead coiling grilles.

5.2 Products

Fire Shutters:

1. Material: Painted steel.
2. Operation: Building fire alarm system and fusible link.

Interior Overhead Coiling Doors and Counter Doors:

1. Material: Painted steel.
2. Operation: Electric typical.

Interior Overhead Coiling Grilles:

3. Material: Aluminum.
4. Operation: Electric typical.

6. 083350 - HORIZONTAL SLIDING FIRE DOORS

6.1 Project Includes

Horizontal sliding accordion-type fire doors.

6.2 Products

Horizontal sliding fire doors:

1. Type: Accordion folding.
2. Material: Painted steel.
3. Operation: Building fire alarm system and fusible link.

7. 083610 - SECTIONAL DOORS

7.1 Project Includes

Exterior sectional overhead doors.

7.2 Products

Material: Galvanized steel, flat sections.

Core: Insulated construction, thermal break.

Operation: Motorized.

Auxiliary Materials: Tracks, supports, weatherstripping, hardware, and accessories.

Finish: Factory finished or factory-primed for site finish.

8. 084110 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

8.1 Project Includes

Aluminum-framed entrances and storefronts. Interior and exterior applications.

8.2 Sustainable Design

Provide aluminum-framed entrances and storefronts with the following sustainable design features:

1. Recycled content.
2. Low VOC adhesives and sealants.

8.3 Quality Assurance

Testing: Entrance and storefront performance in accordance with project specifications.

Performance Design: Sill pans and receptors with end dams.

8.4 Products

Entrances and Storefront:

1. Material: Aluminum, ASTM B209 sheet and ASTM B221 extrusions.
3. Construction: Thermal break.
4. Door Style: Rugged (five inch wide) stile and rail doors as shown on the Drawings.
5. Glass and Glazing: Insulated units at exterior, tempered glass as required.
6. Door Hanging Devices: Ball-bearing hinges.
7. Aluminum Finish: AAMA 2605, 3-coat metallic fluoropolymer finish, 70 percent resin.

Auxiliary Materials – See Hardware Section

1. Push/pulls, door stops, overhead holders, and deadlocks.
2. Weatherstripping and thresholds.
3. Exit devices.

9. 084226 - ALL-GLASS ENTRANCES

9.1 Project Includes

Interior all-glass entrances and sidelites.

9.2 Products

Material: Tempered glass with polished edges; mandatory film or decal to minimize injury to the visually impaired.

Fittings: Stainless steel with No. 4 finish typical.

Hardware: Closers, push-pull, locks.

10. 084410 - GLAZED ALUMINUM CURTAIN WALLS

10.1 Project Includes

Glazed aluminum curtain walls:

1. Aluminum stick type glazed aluminum curtain wall with interior and exterior exposed metal framing.
2. Structural sealant glazed curtain walls.

10.2 Sustainable Design

Provide glazed aluminum curtain walls with the following sustainable design features:

1. Recycled content.
2. Low VOC adhesives and sealants.

10.3 Quality Assurance

Testing: Curtain wall performance in accordance with project specifications.

Performance Design: Sill pans and receptors with end dams.

10.4 Products

Primary Components: Extruded aluminum framing, internal reinforcement, insulated spandrel panels, trim, and filler units, sealants, and gaskets.

1. Material: Aluminum, ASTM B209 sheet and ASTM B221 extrusions.
2. Vents: Operable vents with screens.
3. Glazing: Clear insulating glass with low-e coating and as specified.
4. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.
5. Mullion Caps: Custom profile.

6. Integral Sun Control Fins: Custom profile where indicated.

Construction: Thermal break type.

Finish: AAMA 2605, 3-coat fluoropolymer finish, 70 percent resin.

11. 085110 - ALUMINUM WINDOWS

11.1 Project Includes

Aluminum windows, factory glazed.

11.2 Sustainable Design

Provide aluminum windows with the following sustainable design features:

1. Recycled content.
2. Low VOC adhesives and sealants.

11.3 Quality Assurance

Testing: Window performance in accordance with project specifications.

Procedures for Historic Buildings at MIT: MIT maintains a database of drawings and specifications for project procedures. Request information from the MIT Project Manager.

11.4 Products

Window Operation: Casement, double-hung and fixed windows; screens at operable units.

Heavy Commercial grade to AAMA 101.

Glazing: Insulating glass 1 inch thick; low-e coating and as specified.

Construction: Thermal break type.

Aluminum Window Members: Aluminum extrusions.

Anchors, Clips, and Window Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.

Finish: AAMA 2605, 3-coat fluoropolymer finish, 70 percent resin.

MIT Main Group Buildings, Historically-Appropriate Aluminum Windows:

1. Type: Custom-fabricated double-hung counterbalanced aluminum windows by Custom Window Division of Wausau and Graham Aluminum Windows.
2. Color: Custom formula to match MIT Color No. Devflex 4216 0200 01 (gallon formula: BLK 1P25, YOX 2P10, OXR 0P33, GRN 0P4)

12. 085200 - WOOD WINDOWS

12.1 Project Includes

Wood windows may include:

1. Wood windows.
2. Wood frames for stained glass windows.
3. Reinstallation of stained glass windows with exterior protective panels.

12.2 Sustainable Design

Provide wood windows with the following sustainable design features:

1. Recycled content.
2. Low VOC adhesives and sealants.
3. FSC certified wood.

12.3 Quality Assurance

Testing: Window performance in accordance with project specifications.

Procedures for Historic Buildings at MIT: MIT maintains a database of drawings and specifications for project procedures. Request information from the MIT Project Manager.

12.4 Products

Window Operation: Casement, double-hung and fixed windows; screens at operable units.

Glazing: Insulating glass 1 inch thick; low-e coating and as specified.

Construction: Thermal break type.

Anchors, Clips, and Window Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.

Finish: Manufacturer's standard high-performance painted finish at exterior; primed for field painting at interior.

13. 086300 - METAL FRAMED SKYLIGHTS

13.1 Project Includes

Metal framed skylight systems.

13.2 Sustainable Design

Provide metal framed skylight systems with the following sustainable design features:

1. Recycled content.
2. Low VOC adhesives and sealants.

13.3 Quality Assurance

Testing: Skylight performance in accordance with project specifications.

13.4 Products

Metal Framed Skylights:

1. Type: Standard cap system, self supporting.
2. Construction: Thermal break.

Sloped Glazing:

1. Type: Clear insulating glass, laminated inner lite, heat strengthened exterior lite, and low-e coating.
2. Sealants: Silicone.

Aluminum Finish: AAMA 2605, 3-coat fluoropolymer finish, 70 percent resin.

14. 087100 - DOOR HARDWARE

14.1 Project Includes

Hardware for doors, coordination with final cores and keys to be furnished and installed by MIT.

14.2 Quality Assurance

Accessibility Requirements:

1. Americans with Disabilities Act Accessibility Guidelines (ADAAG).
2. Massachusetts Architectural Access Board (MAAB).
3. Local regulations.

Hardware for Fire-Rated Openings: NFPA 80 and local requirements.

Materials and Application: ANSI A156 series standards.

Security: Coordinate with electronic components and MIT access control system.

14.3 Products

Door Hardware: Campus standard:

1. Quality Level: Commercial type – Grade 1.
2. Hinges: 4-1/2 by 4-1/2 inch, ball bearing hinges. Use Heavy Weight Hinges on exterior applications and openings with leaves in excess of 36 inches in width. Electric hinges shall not be used. If power or signal transfer is required, use Von Duprin EPT-10; no substitutions. Non-rising pin (NRP) hinges to be used on all exterior openings and all outswing access controlled openings.
3. Exit Devices: Von Duprin; no substitutions. 99 Series for flush and wide stile doors, 33 series if narrow stile leaves are approved by MIT, 88 series for historical applications only. Rim exit devices on single leaves shall be basis for design. If pairs of doors are required, surface vertical rod devices - 9927 series shall be used, with top latches only. Concealed vertical rod devices are not to be used. If mullions are to be used, Von Duprin KR4954 mullion shall be used. For access controlled openings, add QEL & RX options. Cylinder dogging only on devices where dogging feature is required – no hex key dogging.
4. Closers: LCN 4040 XP Series, no substitutions. Closers to be supplied with metal covers and sex bolts. Hold open applications, where required to use H CUSH parallel arm configuration, or Spring H-Cush on exterior applications. Hold open feature shall not be used on access controlled openings.
5. Locksets: Schlage L9000 mortise locks, no substitutions. Campus standard is 06 Lever, with L escutcheon trim. For access controlled applications, use L9092 RX & finish per project.
6. Keying: Removable cores for all exit locksets and exit devices. FSIC Schlage (JD option) for Physical Plant and Education areas, SFIC (BD option) for Resident Life areas.
7. Automatic Operators: LCN Senior Swing or Tormax Operators per application requirements; no substitutions. Openings equipped with automatic operators to use 4

inch high head jamb sections. Actuator buttons to be 4-1/2 inch square. Jamb mounted actuators to be used only if wall and area conditions do not permit use of wall mounted buttons. All actuator buttons shall include universal handicap symbol and text. If RF actuator option is required due to mounting and wiring issues, 433 MHz type devices shall be used.

8. Finishes: 626 (US26D) or brushed stainless steel on exposed surfaces typical. Brass or bronze finishes only to be used to match existing building historical conditions for partial renovation and repair projects.
9. Magnetic Locks and Electric Strikes: Not acceptable for MIT projects without prior review and approval by MIT Facilities and Security Departments. If electric strikes must be used, Von Duprin 6000 series, model specific for application; no substitutions.
10. Power: For access controlled exit devices and locksets provided by access control equipment furnished and installed by MIT approved Access Control Systems Integrators.

Auxiliary Materials:

1. Door Trim Units: Kickplates and related trim. Kickplates 8 inches high, 2" LDW on single leaves, 1" LDW on pairs. Thresholds – Zero Manufacturing, no substitutions. Thermal break thresholds are required on exterior openings. Smooth top thresholds at all openings equipped with automatic door bottoms.
2. Stops: Floor stops are MIT standard, wall stops are not to be used. Kick down door stops are not to be used on any opening where ADA accessibility is required.
3. Overhead Door Holders: Glynn-Johnson 450 series for medium duty interior, 900 series for heavy duty and any exterior applications. For concealed applications, use 100 series.
4. Flush Bolts and Coordinators for Paired Doors: Manual or constant latching flush bolts only. Automatic flush bolts are not to be used. Use only flat bar coordinators with filler plates to opening size as required.
5. Weatherstripping and Thresholds for Exterior Doors: Zero Manufacturing; no substitutions. Profile and type as required for application. Where door closers or surface applied strikes are required, gasket type shall be have solid metal substrate allowing closer brackets and strikes to be mounted directly to gasket, or brackets manufactured by Zero are to be utilized to allow installation of gasketing with no breaks.
6. Soundstripping and Gaskets: Zero Manufacturing; no substitutions, profile and type as required for application. Where door closers or surface applied strikes are required, gasket type shall be have solid metal substrate allowing closer brackets and strikes to be mounted directly to gasket, or brackets manufactured by Zero are to be utilized to allow installation of gasketing with no breaks.
7. Card Readers: Provided by MIT approved access control vendors.

MIT Main Group Building Door Hardware Standards:

1. Finish: Antique bronze matching existing.
2. Butts/Hinges - Stanley, McKinney, Hager.

3. Keying and Locksets - Schlage.
4. Exit Devices - Von Duprin.
5. Door Closers - LCN.
6. Pulls, Wall Stops, Floor Stops - Rockwood, Hager, Ives.
7. Gasketing - NGP, Pemko, Hager.
8. Handicap Power Operators - Tormax.

15. 088000 - GLAZING

15.1 Project Includes

Glazing may include:

9. Exterior insulated glass.
10. Door glazing and interior glazed panels.
11. Unframed mirrors.
12. Glazing film.

15.2 Sustainable Design

Provide glazing with the following sustainable design features:

1. Low VOC adhesives and sealants.

15.3 Quality Assurance

Field-Constructed Mock-Up: Each type of glazing.

Glazing Standards:

1. Glass Association of North America (GANA) “Glazing Manual.”
2. SIGMA TM-3000, “Glazing Guidelines for Sealed Insulating Glass Units.”
3. Safety Glazing: 16 CFR 1201.
4. Fire Rated Glazing: NFPA 80, NFPA 252, and NFPA 257.

Testing: Glazing performance in accordance with project specifications.

15.4 Warranty

Insulated Glass Warranties: Manufacturer’s 10 year warranty.

15.5 Products

Glass:

1. Primary Glass Products: Clear float glass, ASTM C1036.
2. Heat-Treated Glass Products: Heat-strengthened, tempered, ASTM C1048.
3. Laminated Glass Products: ASTM C1172.
4. Fire Rated Ceramic Glazing: Clear with thickness and fire rating as required.
5. Mirrors: ASTM C1503, silvering and protective coatings.
6. Glazing Film: 3M or equal. Use of partial glazing film is mandatory to prevent injury to the visually impaired; typically at all-glass entrances and sidelights.
7. Glazing Film at MIT Main Group Building: Standard glazing film is 3M Dusted Crystal.

Glazing:

1. Elastomeric glazing sealants.
2. Preformed glazing tapes.
3. Setting blocks, spacers, and compressible filler rods.
4. Mirror adhesive and mounting hardware.

16. 089000 - LOUVERS AND VENTS

16.1 Project Includes

Fixed metal wall louvers.

16.2 Sustainable Design

Provide louvers and vents with the following sustainable design features:

1. Recycled content.

16.3 Quality Assurance

Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

FM Global: Projects must comply with FM Global requirements. Materials must be listed in the FM Approval Guide.

Performance Design: Sill pans to drain water.

16.4 Products

Aluminum Louvers:

1. Aluminum Extrusions: ASTM B221, alloy 6063 T5 or T51.
2. Blades: Horizontal drainable blades typical.
3. Blade Type: Fixed.

Accessories: Bird screens, insect screens, and blank-off panels.

Aluminum Finish: AAMA 2605, 3-coat fluoropolymer finish, 70 percent resin.

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