

SECTION 081433- STILE AND RAIL WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior stile and rail wood doors.
2. Interior fire-rated stile and rail wood doors and wood frames.
3. Factory finishing stile and rail wood doors.
4. Factory fitting wood doors to frames and factory machining for hardware.
5. Louvers installed in stile and rail wood doors.
6. Light frames and glazing installed in stile and rail wood doors.

B. Related Sections:

1. Division 01 Section "Sustainable Design Requirements" for additional LEED documentation and requirements.
2. Division 06 Section "Interior Architectural Woodwork" for requirements for veneers from the same flitches for both architectural woodwork and stile and rail wood door panels.
3. Division 06 Section "Paneling" for requirements for veneers from the same flitches for both wood paneling and stile and rail wood door panels.
4. Division 08 Section "Hollow Metal Doors and Frames" for wood doors in steel frames.
5. Division 08 Section "Glazing" for glass view panels in stile and rail wood doors.
6. Division 08 Sections "Door Hardware" and "Access Control Hardware" for door hardware for stile and rail wood doors and wood frames.
7. Division 28 Section "Access Control" for access control devices installed at door openings and provided as part of a security access system.

C. Standards and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. Forestry Stewardship Council (FSC) - Guidelines for environmentally certified wood doors.
2. Intertek Testing Service (ITS Warnock Hersey) - Certification Listings for Fire Doors.
3. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.

4. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
5. Scientific Certification Systems (SCS) - Certified Products Standards.
6. UL 10C - Positive Pressure Fire Tests of Door Assemblies; UL 1784 - Standard for Air Leakage Tests of Door Assemblies.
7. United States Green Building Council (USGBC).
8. Window and Door Manufacturers Association - WDMA I.S.6-A Industry Standard for Architectural Stile and Rail Doors.

1.3 SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.6-A classifications. Include factory finishing specifications as applicable.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the wood door supplier in order to prepare the doors and frames to receive the finish hardware items.
- C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 1. Indicate dimensions and locations of mortises and holes for hardware.
 2. Indicate dimensions and locations of cutouts.
 3. Indicate requirements for veneer matching.
 4. Indicate doors to be factory finished and finish requirements.
 5. Indicate fire protection ratings for fire rated doors.
- D. Samples for Initial Selection: For each species and finish required.
 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 2. Corner sections of doors, 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide samples for each species of veneer and solid lumber required.
 - b. Finish veneer faced door samples with same materials proposed for factory finished doors.
 3. Frames for light openings, 6 inches long, for each material, type, and finish required.
- E. Informational Submittals:
 1. LEED Documentation: Submit manufacturer's environmental documentation and applicable sustainability program credits that are available to contribute towards a LEED rated project certification.

- F. Warranty: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain stile and rail wood doors through one source from a single manufacturer wherever possible.
- B. Quality Standard for Doors of Stock and Special Design and Construction: Comply with WDMA I.S.6A, Industry Standard for Architectural Stile and Rail Doors.
- C. Fire Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL 10C (neutral pressure testing according to UL 10B where specified).
 - 1. Temperature Rise Limit: Where indicated and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire test exposure.
 - 2. Smoke Control Door Assemblies: Comply with NFPA 105.
 - 1) Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Environmental Certification: Provide Forestry Stewardship Council (FSC) authorized certificate for doors requiring environmental certification. Environmental certification ensures that wood components come from certified forests and are processed by certified chain-of-custody manufacturers.
- E. Safety Glass: Provide products complying with testing requirements in 16 CFR 1201, for Category II materials, unless Category I materials are expressly indicated and permitted.
- F. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for receiving, handling, and installing stile and rail wood doors.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Mark each door on top rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 - 1. Temperature and Relative Humidity Requirements: Relative humidity to be 25 to 55 percent; temperature 60 to 80 degrees F (15.6 to 27.7 degrees C). Maintain required temperature and relative humidity in spaces where products will be installed for a minimum of 24 hours before, during, and after installation as recommended by manufacturer.

1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form signed by manufacturer, installer, and contractor in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - 2. Warranty Period for Interior Stile and Rail Doors: One (1) year according to manufacturer's written warranty from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 STILE AND RAIL DOOR CONSTRUCTION - GENERAL

- A. WDMA I.S.6-A Grade for Transparent Finish: Premium. Assemble doors, including components, with minimum WDMA Type II adhesives.
- B. WDMA I.S.6-A Grade for Opaque Finish: Custom. Assemble doors, including components, with minimum WDMA Type II adhesives.
- C. Fire Rated Doors: Provide construction and core specified above as needed to provide fire ratings indicated. Doors must be "true" stile and rail construction. "Simulated" or "sketch-faced" veneer faces are not acceptable.
 - 1. Interior Fire Rated Doors (20-Minute Rating): Fire rated doors with 1-3/4-inch (44-mm) thick stiles and rails complying with requirements indicated for interior doors.
 - 2. Interior Fire Rated Doors (45 and 60 Minute Ratings): Fire rated doors with 1-3/4-inch (44-mm) thick, edged and veneered non-combustible core stiles and rails complying with requirements indicated for interior doors.
 - 3. Interior Fire-Rated Doors (90 Minute Rating): Fire rated doors with 2-1/4-inch (57-mm) thick, edged and veneered non-combustible core stiles and rails complying with requirements indicated for interior doors.

4. Pairs: Provide fire retardant stiles that are listed and labeled for applications indicated without formed steel edges and astragals. Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
- D. Raised-Panel Thickness: Manufacturer's standard, but not less than 1-5/8 inches (41 mm) for 2-1/4 inch (57 mm) thick doors, 1-1/8 inches (29 mm) for 1-3/4 inch (44 mm) thick doors, and 3/4 inches (19 mm) for 1-3/8 inch (35 mm) thick doors.
- E. Flat-Panel Thickness: Manufacturer's standard, but not less than 1-1/8 inches (29 mm) for 2-1/4 inch (57 mm) thick doors, 5/8 inches (16 mm) for 1-3/4 inch (44 mm) thick doors, and 1/4 inch (6 mm) for 1-3/8 inch (35 mm) thick doors.
- F. Environmentally Responsible Doors: Provide where specified doors manufactured with the following environmentally responsible components:
 1. Credits MR 4.1 and MR 4.2: Interior doors to contain a minimum of 55% recycled & recovered content, as certified by SCS (Scientific Certification Systems). Include evidence that door manufacturer is certified with SCS by providing certificates and labeling.
 2. Credit MR 7: Interior doors to contain a minimum of 70% of wood based materials certified compliant with the Forestry Stewardship Council Chain of Custody FSC Principles and Criteria for wood building components. Include evidence that door manufacturer is certified with FSC by providing certificates and appropriate documentation.
 3. Credit EQ 4.4: Provide doors made with adhesives that do not contain added urea-formaldehyde resins. Interior doors made with composite wood products to have urea-formaldehyde emission levels below the published maximums in the ANSI A208.1-latest edition Particleboard standard.

2.2 STILE AND RAIL DOORS FOR TRANSPARENT FINISH - INTERIOR

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Algoma Hardwoods, Inc.
 2. Eggers Industries.
 3. **The Maiman Company.**
 4. Substitutions: Requests for substitution and product approval in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.
- B. Interior Solid Core Doors:
 1. Stile and Rail Construction: Veneered, minimum 1/16" before sanding; structural engineered core; edgebands same species as face veneer.
 2. Raised-Panel Construction:

- a. Veneered, shaped, wood-based panel product with veneer conforming to raised-panel shape (3-ply veneer).
 - b. Veneered, wood-based panel product with mitered, raised rims made from matching clear lumber (rim-banded).
3. Flat-Panel Construction: Veneered, wood-based panel product.
 4. Wood Species for Transparent Species: **[Insert species]**.
 - a. Cut:
 - 1) Plain sawn.
 - 2) Quarter sawn.
 - 3) Rift cut.
 5. Size, Layout and Thickness: As indicated on Drawings.

2.3 STILE AND RAIL DOORS FOR OPAQUE FINISH - INTERIOR

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Algoma Hardwoods, Inc.
 2. Eggers Industries.
 3. **The Maiman Company.**
 4. Substitutions: Requests for substitution and product approval in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.
- B. Interior Solid Core Doors:
 1. Stile and Rail Construction: Veneered, minimum 1/16" before sanding; structural engineered core; edgebands same species as face veneer.
 2. Raised-Panel Construction: Shaped, medium-density fiberboard.
 3. Flat-Panel Construction:
 - a. Veneered, with closed grain hardwood veneer on wood-based panel product.
 - b. Medium-density fiberboard.
 4. Wood Species for Opaque Finish: Manufacturer's standard mill option species and cut for stiles and rails; with panels of same species or wood-based composite materials.
 5. Size, Layout and Thickness: As indicated on Drawings.

2.4 FIRE RATED INTERIOR WOOD FRAMES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Algoma Hardwoods, Inc.
2. **The Maiman Company.**

- B. Non-Rated and 20 Minute Fire Rated Wood Door Frames: Frames, complete with transom and sidelite frames, fabricated from veneered structural composite lumber for transparent finish or solid lumber close grained hardwood for opaque finish.
- C. Fire Rated (45, 60 and 90 Minute) Wood Door Frames: Frames, fabricated from veneered high density composite fire resistant board, with fire rating duration indicated.
- D. Wood Species for Transparent Finishes: **[Insert species]**.
 1. Cut:
 - a. Plain sliced (flat sliced).
 - b. Quarter sliced.
 - c. Rift cut.
- E. Wood species for Opaque Finishes: Manufacturer's standard mill option paint grade species.
- F. Frame Profiles: As indicated on Drawings.

2.5 FABRICATION

- A. Fabricate stile and rail wood doors in sizes indicated.
- B. Fit doors to suit frame opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 1. Comply with requirements in NFPA 80 for fire rated doors.
- C. Factory machine doors for hardware that is not surface applied. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 2. Metal Astragals: Factory machine astragals and formed steel edges for hardware for pairs of fire rated doors.
- D. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
- E. Openings: Trim openings indicated for glazing with solid wood moldings (non-rated and 20 minute fire-rated), with one side removable. For 45, 60, and 90-minute fire rated glazed openings, provide veneered metal for transparent finish doors (primed metal for opaque finish) for glazed openings
 1. Solid Wood Moldings: Trim openings with material and profile indicated.

2. Field Glazing: Comply with applicable requirements in Division 08 Section "Glazing."
 3. Louvers: Factory install louvers in prepared openings.
- F. Electrical Raceways: Provide stile and rail wood doors receiving electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through wire transfer hardware or wiring harness specified in hardware sets in Division 08 "Door Hardware". Wire nut connections are not acceptable.

2.6 FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including machining for hardware that is not surface applied, before finishing.
- B. Door for Transparent Finish: Provide a clear protective coating over the wood veneer allowing the natural color and grain of the selected wood species to provide the appearance specified. Stain is applied to the wood surface underneath the transparent finish to add color and design flexibility.
1. Grade: Premium.
 2. Finish: Meet or exceed WDMA TR6 Catalyzed Polyurethane finish performance requirements.
 3. Staining: As selected by Architect from manufacturer's full range.
- C. Doors for Opaque Finish: Shop apply one coat of wood primer as specified in Division 09 Section "Painting" to faces, edges, and tops and bottoms of doors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.

1. Install fire rated doors in corresponding fire rated frames according to NFPA 80.
- C. Factory Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated. Do not trim stiles and rails in excess of limits set by manufacturer or as permitted with fire-rated doors. Machine doors for hardware. Seal cut surfaces after fitting and machining.
1. Clearances: Provide 1/8 inch (3.2 mm) at heads, jambs, and between pairs of doors. Provide 1/8 inch (3.2 mm) from bottom of door to top of decorative floor finish or covering. Where threshold is shown or scheduled, provide 1/4 inch (6.4 mm) from bottom of door to top of threshold. Bevel non-rated doors 1/8 inch in 2 inches (3-1/2 degrees) at lock and hinge edges.
 2. Comply with NFPA 80 for fire rated doors.
- E. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Replace doors that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 081433