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For more information, contact Oregon Door, PO Box 1960, Winston, OR 97496; Phone: (541) 679-6791; Fax: (541) 679-5063; Website: www.oregondoor.com; Email: sales@oregondoor.com.

SECTION 081416 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Solid-core doors **[and transom panels]** with **[wood-veneer] [MDO] [hardboard or MDF] [and] [plastic-laminate]** faces.
2. Hollow-core doors with **[wood-veneer] [hardboard or MDF] [and] [plastic-laminate]** faces.
3. **[Shop priming] [Factory finishing]** flush wood doors.
4. Factory machining for hardware.

- B. Related Requirements:

1. **[Section 062023 "Interior Finish Carpentry] [Section 064800 "Wood Frames]"** for wood door frames **[including fire-rated wood door frames]**.
2. Section 064216 "Flush Wood Paneling" for requirements for veneers from the same flitches for both flush wood doors and flush wood paneling.
3. Section 083473.16 "Wood Sound Control Door Assemblies" for acoustic flush wood doors.
4. Section 088000 "Glazing" for glass view panels in flush wood doors for **[factory] [field]** installation.

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5. **[Section 099123 "Interior Painting"] [and] [Section 099300 "Staining and Transparent Finishing"]** for field finishing doors.
6. Section 134900 "Radiation Protection" for lead-lined flush wood doors.

1.3 PRE-INSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at **[Project site] <Insert location>**.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of door. Include details of core and edge construction **[louvers]** and trim for openings. **[Include factory-finishing specifications.]**

- B. LEED Submittals:

1. Product Data for Credit MR 4: For products having recycled content, provide documentation indicating percentage by weight of post-consumer and pre-consumer/post-industrial recycled content.
 - a. Provide statement indicating cost for each material having recycled content.
 - b. Provide third party certification for recycled content.
2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
3. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regionally manufactured **[and regionally extracted and manufactured]** materials. Include statement indicating cost for each regionally manufactured material.
 - a. Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.
 - b. Include statement indicating location of manufacturer and point of extraction, harvest, or recovery for each raw material used in regionally extracted and manufactured materials. Indicate distance to Project and fraction by weight of each regionally manufactured material that is regionally extracted.
4. Certificates for **[Credit MR 6] [Credit MR 7]**: Chain-of-custody certificates indicating that flush wood doors comply with forest certification requirements. **[Include documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body.]** Include statement indicating cost for each certified wood product.
5. Product Data for Credit IEQ 4.4: For adhesives and composite wood products, documentation indicating that product contains no added urea formaldehyde. Prefer products that are third-party certified through GREENGUARD.

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1. Laboratory Test Reports for Credit IEQ 4.1: For adhesives, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers." Prefer products that are third-party certified through GREENGUARD Gold.
 2. Laboratory Test Reports for Credit IEQ 4.2: For paints and coatings, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers." Prefer products that are third-party certified through GREENGUARD Gold.
 3. Laboratory Test Reports for Credit IEQ 4.4: For composite wood products, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers." Prefer products that are third-party certified through GREENGUARD Gold.
- C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; and the following:
1. Dimensions and locations of blocking.
 2. Dimensions and locations of mortises and holes for hardware.
 3. Dimensions and locations of cutouts.
 4. Undercuts.
 5. Requirements for veneer matching.
 6. Doors to be factory finished and finish requirements.
 7. Fire-protection ratings for fire-rated doors.
- D. Samples for Initial Selection: For **[plastic-laminate door faces] [and] [factory-finished doors]**.
- E. Samples for Verification:
1. Factory finishes applied to actual door face materials, approximately **8 by 10 inches (200 by 250 mm)**, 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 finished Work.]**
 2. Plastic laminate, **2 inches by 3 inches (50 mm by 75 mm)** rectangular, for each color, texture, and pattern selected.
 3. Construction samples of doors, approximately **5 by 5 inches (125 by 125 mm)**, with door faces and edges representing actual materials to be used.
 4. Louver blade and frame sections, **6 inches (150 mm)** long, for each material and finish specified.
 5. Frames for light openings, **6 inches (150 mm)** long, for each material, type, and finish required.
 - 1.

1.2 INFORMATIONAL SUBMITTALS

- A. Sample Warranty: For special warranty.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is certified for chain of custody by an FSC-accredited certification body when FSC certified wood is specified.
- B. Vendor Qualifications: A vendor that is certified for chain of custody by an FSC-accredited certification body when FSC wood is specified.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package factory finished wood veneer doors individually in plastic bags or cardboard cartons.
- C. Package raw (unfinished) wood veneer doors and plastic laminate faced doors with factory standard paper or cardboard slip sheets between each individual door leaf.
- D. Mark each door on the top rail with the opening number, door handling, and door construction, including face veneer type used on Shop Drawings. Do not apply any information to the bottom rail.

1.5 FIELD CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during remainder of construction period.
- B. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining temperature between **60° and 90° F (16° and 32° C)** and relative humidity between **[25 and 55] [43 and 70] [17 and 50] <Insert numbers>** percent during remainder of construction period.

1.6 WARRANTY

- A. Special Warranty: 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 (6.4 mm)** in a **42-by-84-inch (1067-by-2134-mm)** section of a **1.75 inch (44.5 mm)** thick door.
 - b. Telegraphing of core construction in face veneers exceeding **0.01 inch in a 3-inch (0.25 mm in a 76.2-mm)** span.
 2. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
 3. Warranty Period for Solid-Core Exterior Doors: **[Two] [Five] <Insert number>** years from date of Substantial Completion.
 4. Warranty Period for Solid-Core Interior Doors: Life of installation.
 5. Warranty Period for Hollow-Core Interior Doors: **[One] [Two] <Insert number>** year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product; Subject to compliance with requirements, provide Oregon Door; solid core wood doors.
- B. Source Limitations: Obtain flush wood doors from single manufacturer.

2.2 FLUSH WOOD DOORS, GENERAL

- A. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, "Architectural Wood Flush Doors."
- B. Regional Materials: Flush wood doors shall be manufactured within **500 miles (800 km)** of Project site from materials that have been extracted, harvested, or recovered, as well as manufactured, within **500 miles (800 km)** of Project site.
- C. Regional Materials: Flush wood doors shall be manufactured within **500 miles (800 km)** of Project site.
- D. Certified Wood: Flush wood doors shall be certified as "FSC Mixed Credit" according to FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship," and to FSC STD-40-004, "FSC Standard for Chain of Custody Certification."
 1. Low-Emitting Materials: Fabricate doors with adhesives and composite wood products that do not contain added urea formaldehyde. Prefer products that are third-party certified through GREENGUARD.
- E. Low-Emitting Materials: Fabricate doors with **[adhesives] [and] [composite wood products]** that comply with the testing and product requirements of the California

Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers." Prefer products that are third-party certified through GREENGUARD Gold.

- F. WDMA I.S.1-A Performance Grade: **[Extra Heavy Duty] [Heavy Duty] [As indicated]**.
1. **[All doors must meet specified WDMA performance duty level, including face screw holding requirement. Surface applied hardware shall be installed with screws; through-bolts are not acceptable.] [All doors must meet specified WDMA performance duty level, with the exception of face screw holding requirement. Surface applied hardware may be installed with through-bolts.]**
- G. WDMA I.S.1-A Performance Grade:
1. Heavy Duty unless otherwise indicated.
 2. Extra Heavy Duty: **[Classrooms] [public toilets] [janitor's closets] [assembly spaces] [exits] [and] [patient rooms] <Insert locations>[and where indicated]**.
 - a. **[All doors must meet specified WDMA performance duty level, including face screw holding requirement. Surface applied hardware shall be installed with screws; through-bolts are not acceptable.] [All doors must meet specified WDMA performance duty level, with exception of face screw holding requirement. Surface applied hardware may be installed with through-bolts.]**
- H. Fire-Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to **[NFPA 252] [or] [UL 10C]**.
1. Oversize Fire-Rated Door Assemblies: For units exceeding sizes of tested assemblies, provide certification by a qualified testing agency that doors comply with standard construction requirements for tested and labeled fire-rated door assemblies except for size.
 2. Temperature-Rise Limit: **[Where indicated] [At vertical exit enclosures and exit passageways]**, provide doors that have a maximum transmitted temperature end point of not more than **450° F (250° C)** above ambient after 30 minutes of standard fire-test exposure.
 3. Cores: Provide core specified or mineral core as needed to provide fire-protection rating indicated.
 4. Blocking: Provide composite blocking approved for use in doors of fire-protection ratings indicated as needed to maintain WDMA performance level and eliminate through-bolting hardware.
 5. Edge Construction: Provide edge construction with **[Category A - intumescent seals included in door construction where required.] [Category B - intumescent seals applied to frames by door installer where required.]**
 6. Retain "Pairs" Subparagraph below if steel edges and astragals are unacceptable. Coordinate availability and ratings with manufacturers.
 7. Pairs: Provide fire-retardant stiles that are listed and labeled for applications indicated without formed-steel edges and astragals.

8. Pairs: Provide formed-steel edges and astragals with intumescent seals.
 - a. Provide steel edges and astragals primed for field painting.
 - b. Provide veneer wrapped steel edges and astragals. Veneer shall be same specie as face.
 - c. Finish steel edges and astragals with baked enamel, color as selected from manufacturer's standard offering.
 - d. Provide stainless steel edges and astragals.
- I. Smoke- and Draft-Control Door Assemblies: Listed and labeled for smoke and draft control, based on testing according to UL 1784.
- J. Dutch Doors:
 1. Provide dutch doors with internal wood blocking, flush cut as required [**without shelf**] [**with shelf**].
 - a. Shelf Width: [**8 inches (203 mm)**] [**10 inches (254 mm)**] [**12 inches (305 mm)**] [**As shown**].
- K. Particleboard-Core Doors:
 1. Particleboard: ANSI A208.1, [**Grade LD-1**] [**or**] [**Grade LD-2**], made with binder containing no urea-formaldehyde.
 2. Particleboard: Straw-based particleboard complying with ANSI A208.1, Grade LD-2 or M-2, except for density.
 3. Blocking: Provide wood blocking in particleboard-core doors as [**needed to eliminate through-bolting hardware**]. [**follows:**]
 - a. **5-inch (125-mm)** top-rail blocking, in doors indicated to have closers.
 - b. **5-inch (125-mm)** bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
 - c. **5-inch (125-mm)** midrail blocking, in doors indicated to have exit devices.
 4. Provide doors with [**glued-wood-stave**] [**or**] [**structural-composite-lumber**] cores instead of particleboard cores for doors indicated to receive exit devices.
- L. Structural-Composite-Lumber-Core Doors:
 1. Provide structural composite lumber core as required to meet WDMA performance duty level specified.
 2. Provide structural composite lumber core for [**doors with glass openings as required to meet stile dimensions shown on door schedule and elevations**] [**all doors with exception of 45-90 minute fire-rated and sound-rated doors**].
 3. Structural Composite Lumber: WDMA I.S.10.
 - a. Screw Withdrawal, Face: **700 lbf (3100 N)**.
 - b. Screw Withdrawal, Edge: **400 lbf (1780 N)**.

M. Hollow-Core Doors:

1. Construction: [**Institutional**] [**Standard**] hollow core.
2. Blocking: Provide wood blocking with minimum dimensions as follows:
 - a. **5-by-18-inch (125-by-460-mm)** lock blocks [**at both stiles**].
 - b. **5-inch (125-mm)** top-~~[and bottom-]~~ rail blocking.
 - c. **10-inch (250-mm)** [**top- and**] bottom-rail blocking.
 - d. **2-1/2-inch (64-mm)** midrail blocking.

2.3 VENEER-FACED DOORS FOR TRANSPARENT FINISH

A. Exterior Solid-Core Doors <Insert drawing designation>:

1. Grade: [**Premium (Grade AA faces)**] [**Custom (Grade A faces)**].
2. Species: [**African Mahogany**] [**Anigre**] [**Select white ash**] [**Figured select white ash**] [**Select white birch**] [**Select red birch**] [**Select natural birch**] [**Cherry**] [**Select white maple**] [**Red oak**] [**White oak**] [**Sapele**] [**Walnut**] <Insert species>.
3. Cut: [**Rotary cut**] [**Plain sliced (flat sliced)**] [**Quarter sliced**] [**Rift cut (Red & White Oak only)**].
4. Match between Veneer Leaves: [**Book**] [**Slip**] [**Pleasant**] match.
5. Assembly of Veneer Leaves on Door Faces: [**Center-balance**] [**Balance**] [**Running**] match.
6. Pair and Set Match: Provide for doors hung in same opening [**or separated only by mullions**].
7. Exposed Vertical[**and Top**] Edges: [**Same species as faces or a compatible species - edge Type A**] [**Same species as faces - edge Type A**] [**Applied wood-veneer edges of same species as faces and covering edges of faces - edge Type B**] [**Applied wood edges of same species as faces and covering edges of crossbands - edge Type D**].
8. Core: [**Glued wood stave**] [**Structural composite lumber**] [**Either glued wood stave or structural composite lumber**].
9. Construction: [**Five**] [**Five or seven**] plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
10. Adhesives: Type I per WDMA T.M.-6.
11. WDMA I.S.1-A Performance Grade: [**Extra Heavy**] [**Heavy**] Duty.

B. Interior Solid-Core Doors <Insert drawing designation>:

1. Grade: [**Premium (Grade AA faces)**] [**Custom (Grade A faces)**].
2. Species: [**African mahogany**] [**Anigre**] [**Select white ash**] [**Figured select white ash**] [**Select white birch**] [**Select red birch**] [**Select natural birch**] [**Cherry**] [**Select white maple**] [**Red oak**] [**White oak**] [**Sapele**] [**Walnut**] <Insert species>.
3. Cut: [**Rotary cut**] [**Plain sliced (flat sliced)**] [**Quarter sliced**] [**Rift cut**].
4. Match between Veneer Leaves: [**Book**] [**Slip**] [**Pleasant**] match.
5. Assembly of Veneer Leaves on Door Faces: [**Center-balance**] [**Balance**] [**Running**] match.

6. Pair and Set Match: Provide for doors hung in same opening [**or separated only by mullions**]. Provide sets of up to four doors.
7. Room Match: Match door faces within each separate room or area of building. Corridor-door faces do not need to match where they are separated by [**10 feet (3 m)**] [**20 feet (6 m)**] <Insert dimension> or more.
8. Room Match: Provide door faces of compatible color and grain within each separate room or area of building.
9. Transom Match: [**Continuous match**] [**End match**] [**As indicated**].
10. Blueprint Match: Where indicated, provide doors with faces produced from same flitches as adjacent wood paneling and arranged to provide blueprint match with wood paneling. Comply with requirements in Section 064216 "Flush Wood Paneling."
11. Exposed Vertical[**and Top**] Edges: [**Same species as faces or a compatible species - edge Type A**] [**Same species as faces - edge Type A**] [**Applied wood-veneer edges of same species as faces and covering edges of faces - edge Type B**] [**Applied wood edges of same species as faces and covering edges of crossbands - edge Type D**].
12. Core: [**Particleboard**] [**Glued wood stave**] [**Structural composite lumber**] [**Either glued wood stave or structural composite lumber**] [**Either glued or nonglued wood stave or structural composite lumber**].
13. Construction: [**Five**] [**Five or seven**] plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
14. Construction: Seven plies, either bonded or nonbonded construction.
15. WDMA I.S.1-A Performance Grade: [**Extra Heavy Duty**] [**Heavy Duty**] [**Standard Duty**] [**As indicated**].

C. Interior Hollow-Core Doors <Insert drawing designation>:

1. Grade: [**Premium (Grade AA faces)**] [**Custom (Grade A faces)**].
2. Species: [**African mahogany**] [**Anigre**] [**Select white ash**] [**Figured select white ash**] [**Select white birch**] [**Select red birch**] [**Select natural birch**] [**Cherry**] [**Select white maple**] [**Red oak**] [**White oak**] [**Sapele**] [**Walnut**] <Insert species>.
3. Cut: [**Rotary cut**] [**Plain sliced (flat sliced)**] [**Quarter sliced**] [**Rift cut**].
4. Match between Veneer Leaves: [**Book**] [**Slip**] [**Pleasant**] match.
5. Assembly of Veneer Leaves on Door Faces: [**Center-balance**] [**Balance**] [**Running**] match.
6. Pair and Set Match: Provide for doors hung in same opening [**or separated only by mullions**]. Provide sets of up to four doors.
7. Exposed Vertical[**and Top**] Edges: [**Same species as faces or a compatible species - edge Type A**] [**Same species as faces - edge Type A**] [**Applied wood-veneer edges of same species as faces and covering edges of faces - edge Type B**] [**Applied wood edges of same species as faces and covering edges of crossbands - edge Type D**].
8. Construction: Seven plies.
9. WDMA I.S.1-A Performance Grade: [**Heavy Duty**] [**Standard Duty**] [**As indicated**].

2.4 DOORS FOR OPAQUE FINISH

A. Exterior Solid-Core Doors <Insert drawing designation>:

1. Grade: **[Premium]** **[Custom]**.
2. Faces: **[MDO]** **[Any closed-grain hardwood of mill option]**.
 - a. Apply MDO directly to high-density hardboard crossbands.
3. Exposed Vertical **[and Top]** Edges: Any closed-grain hardwood.
4. Core: **[Particleboard]** **[Glued wood stave]** **[Structural composite lumber]** **[Either glued wood stave or structural composite lumber]**.
5. Construction: Five **[Five or seven]** plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
6. Adhesives: Type I per WDMA T.M.-6.
7. WDMA I.S.1-A Performance Grade: **[Extra Heavy]** **[Heavy]** Duty.

B. Interior Solid-Core Doors <Insert drawing designation>:

1. Grade: **[Premium]** **[Custom]**.
2. Faces: **[MDO]** **[Any closed-grain hardwood of mill option]** **[Hardboard or MDF]**.
 - a. Apply MDO directly to high-density hardboard crossbands.
 - b. Hardboard Faces: ANSI A135.4, Class 1 (tempered) or Class 2 (standard).
 - c. MDF Faces: ANSI A208.2, Grade 150 or Grade 160.
3. Exposed Vertical **[and Top]** Edges: Any closed-grain hardwood.
4. Core: **[Particleboard]** **[Glued wood stave]** **[Structural composite lumber]** **[Either glued wood stave or structural composite lumber]** **[Either glued or nonglued wood stave or structural composite lumber]**.
5. Construction: **[Three]** **[Five]** plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before veneering.
6. Construction: **[Three]** **[Five]** plies, either bonded or nonbonded.
7. WDMA I.S.1-A Performance Grade: **[Extra Heavy Duty]** **[Heavy Duty]** **[Standard Duty]** **[As indicated]**.

C. Interior Hollow-Core Doors <Insert drawing designation>:

1. Grade: **[Premium]** **[Custom]**.
2. Faces: **[Any closed-grain hardwood of mill option]** **[Hardboard or MDF]**.
 - a. Hardboard Faces: ANSI A135.4, Class 1 (tempered) or Class 2 (standard).
 - b. MDF Faces: ANSI A208.2, Grade 150 or Grade 160.
3. Exposed Vertical **[and Top]** Edges: Any closed-grain hardwood.
4. WDMA I.S.1-A Performance Grade: **[Heavy Duty]** **[Standard Duty]** **[As indicated]**.

2.5 PLASTIC-LAMINATE-FACED DOORS

A. Interior Solid-Core Doors <Insert drawing designation>:

1. Grade: **[Premium]** **[Custom]**.

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2. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, [**Grade HGS**] [**Grade HSH**].
3. Colors, Patterns, and Finishes: [**As indicated**] [**As selected by Architect from laminate manufacturer's full range of products**].
4. Exposed Vertical [**and Top**] Edges: [**Hardwood edges for staining to match faces**] [**Hardwood edges for painting**] [**Plastic laminate that matches faces, applied after faces**] [**Impact-resistant polymer edging, applied after faces**].
 - a. Polymer Edging Color: [**Beige**] [**Brown**] [**Same color as faces**].
5. Core: [**Particleboard**] [**Glued wood stave**] [**Structural composite lumber**] [**Either glued wood stave or structural composite lumber**].
6. Construction: Three plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before faces are applied. [**Faces are bonded to core using a hot press.**]
7. Construction: Five plies. Stiles and rails are bonded to core, then entire unit is abrasive planed before faces and crossbands are applied.
8. WDMA I.S.1-A Performance Grade: [**Extra Heavy Duty**] [**Heavy Duty**] [**As indicated**].

B. Interior Hollow-Core Doors <Insert drawing designation>:

1. Grade: [**Premium**] [**Custom**].
2. Plastic-Laminate Faces: High-pressure decorative laminates complying with NEMA LD 3, [**Grade HGS**] [**Grade HSH**].
3. Colors, Patterns, and Finishes: [**As indicated**] [**As selected by Architect from laminate manufacturer's full range of products**].
4. Exposed Vertical [**and Top**] Edges: [**Hardwood edges for staining to match faces**] [**Hardwood edges for painting**] [**Plastic laminate that matches faces, applied after faces**] [**Impact-resistant polymer edging, applied after faces**].
 - a. Polymer Edging Color: [**Beige**] [**Brown**] [**Same color as faces**].
5. WDMA I.S.1-A Performance Grade: [**Heavy Duty**] [**Standard Duty**] [**As indicated**].

2.6 LIGHT FRAMES AND LOUVERS

- A. Factory Glazing: Refer to Section 088000 "Glazing" for glass view panels in flush wood doors. Factory install glass [**as required**] [**in fire-rated doors only**]. Fill glazing bead nail holes in factory finished doors.
- B. Wood Beads for Light Openings in Wood Doors: Provide manufacturer's standard wood beads unless otherwise indicated.
 1. Wood Species: [**Same species as door faces**] [**Species compatible with door faces**] [**Any closed-grain hardwood**].
 2. Profile: [**Flush rectangular beads**] [**Recessed tapered beads**] [**Recessed tapered beads with exposed banding**] [**Lipped tapered beads**] [**Manufacturer's standard shape**].
 3. At wood-core doors with 20-minute fire-protection ratings, provide wood beads and metal glazing clips approved for such use.

- C. Wood beads for Light Openings in 20 Minute Rated Doors: Manufacturer's standard wood beads matching veneer species of door faces and approved for use in doors of fire-protection rating indicated. Include concealed metal glazing clips as required for opening size.
- D. Metal Frames for Light Openings in Fire-Rated Doors: Manufacturer's standard frame formed of **0.048-inch- (1.2-mm-)** thick, cold-rolled steel sheet; **[factory primed for paint] [with baked-enamel- or powder-coated]** finish **[or] [wood veneer to match face specie]**; and approved for use in doors of fire-protection rating indicated.
- E. Wood Louvers: Door manufacturer's standard solid-wood louvers unless otherwise indicated.
1. Wood Species: **[Same species as door faces] [Species compatible with door faces] [Any closed-grain hardwood]**.
 2. Louver Type: **[Flat slat] [Round slat] [Sight proof V-slat] [As indicated]**.
- F. Metal Louvers:
1. Manufacturers: Subject to compliance with requirements, **[provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. Air Louvers, Inc.
 - b. Anemostat; a Mestek company.
 - c. **<Insert manufacturer's name>**.
 2. Blade Type: **[Vision-proof, inverted V] [Vision-proof, inverted Y] [Darkroom-type, double inverted V]**.
 3. Metal and Finish: Hot-dip galvanized steel or cold rolled sheet, **0.040 inch (1.0 mm)** thick, **[factory primed for paint] [with baked-enamel- or powder-coated]** finish.
 4. Metal and Finish: Extruded aluminum with Class II, clear anodic finish, AA-M12C22A31.
 5. Metal and Finish: Extruded aluminum with **[light bronze] [medium bronze] [dark bronze] [black]**, Class II, color anodic finish, AA-M12C22A32/A34.
- G. Louvers for Fire-Rated Doors: Metal louvers with fusible link and closing device, listed and labeled for use in doors with fire-protection rating of 1-1/2 hours and less.
1. Manufacturers: Subject to compliance with requirements, **[provide products by the following] [provide products by one of the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]**:
 - a. Air Louvers Inc.
 - b. Anemostat; a Mestek company.
 - c. **<Insert manufacturer's name>**.

2. Metal and Finish: Hot-dip galvanized steel, **0.040 inch (1.0 mm)** thick, [**factory primed for paint**] [**with baked-enamel- or powder-coated**] finish.

2.7 FABRICATION

- A. Factory fit doors to suit frame-opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
 1. Comply with NFPA 80 requirements for fire-rated doors.
- B. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with DHI-WDHS-3. Comply with final hardware schedules, door frame Shop Drawings, BHMA-156.115-W, 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.
- C. 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.
 1. Fabricate door and transom panels with full-width, solid-lumber [, **rabbeted,**] meeting rails. Provide factory-installed spring bolts for concealed attachment into jambs of metal door frames.
- D. Openings: Factory cut and trim openings through doors.
 1. Light Openings: Trim openings with moldings of material and profile indicated.
 2. Glazing: Factory install glazing in doors indicated to be factory finished. Comply with applicable requirements in Section 088000 "Glazing."
 3. Louvers: Factory install louvers in prepared openings.
- E. Exterior Doors: Factory treat exterior doors with water repellent after fabrication has been completed but before [**shop priming**] [**factory finishing**].
 1. Flash top of outswinging doors with manufacturer's standard metal flashing.

2.8 SHOP PRIMING

- A. Doors for Opaque Finish: Shop prime faces, all four edges, edges of cutouts, and mortises with one coat of wood primer specified in [**Section 099113 "Exterior Painting."**] [**Section 099123 "Interior Painting."**]
- B. Doors for Transparent Finish: Factory finish door faces and vertical stile edges with stain (if required).

2.9 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on **[top and]** bottom edges, edges of cutouts, and mortises.
- B. Factory finish doors.
- C. Factory finish doors that are indicated to receive transparent finish.
- D. Factory finish doors where indicated in schedules or on Drawings as factory finished.
- E. Use only paints and coatings that comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers." Prefer products that are third-party certified through GREENGUARD.
- F. Transparent Finish:
1. Grade: **[Premium]** **[Custom]**.
 2. Finish: WDMA TR-6 catalyzed polyurethane.
 3. Staining: **[Match Architect's sample]** **[As selected by Architect from manufacturer's full range]** **[None required]**.
 4. Effect: **[Open-grain finish]** **[Filled finish]** **[Semifilled finish, produced by applying an additional finish coat to partially fill the wood pores]**.
 5. Sheen: **[Satin]** **[Semigloss]**.
- G. Opaque Finish:
1. Grade: **[Premium]** **[Custom]**.
 2. Finish: **[WDMA OP-4 conversion varnish]** **[or]** **[WDMA OP-6 catalyzed polyurethane]** **<Insert finish designation>**.
 3. Color: **[Match Architect's sample]** **[As selected by Architect from manufacturer's full range]**.
 4. Sheen: **[Satin]** **[Semigloss]** **[Gloss]**.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames, with Installer present, before hanging doors.
1. Verify that installed frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs. Any deficiencies must be corrected prior to door installation.
 2. Reject doors with defects.

- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see [**Section 087100 "Door Hardware."**] [**Section 087111 "Door Hardware (Descriptive Specification)."**]
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and referenced quality standard, and as indicated.
 - 1. Install fire-rated doors according to NFPA 80.
 - 2. Install smoke- and draft-control doors according to NFPA 105.
- C. Job-Fitted Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer or permitted for fire-rated doors. Machine doors for hardware. Seal edges of doors, edges of cutouts, and mortises after fitting and machining.
 - 1. Clearances: Provide **1/8 inch (3.2 mm)** at heads, jambs, and between pairs of doors. Provide **1/4 inch (6.4 mm)** from bottom of door to top of decorative floor finish or covering unless otherwise indicated. Where threshold is shown or scheduled, provide **1/4 inch (6.4 mm)** from bottom of door to top of threshold unless otherwise indicated.
 - a. Comply with NFPA 80 for fire-rated doors.
 - 2. Bevel non-fire-rated doors **1/8 inch in 2 inches (3 degrees)** at lock and hinge edges.
 - 3. Bevel fire-rated doors **1/8 inch in 2 inches (3 degrees)** at lock and hinge edges; trim stiles and rails only to extent permitted by labeling agency.
- D. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.
- E. Factory-Finished Doors: Do not trim factory-finished doors to width.

3.3 ADJUSTING

- A. Operation: Correct any deficiency that prohibits doors from swinging or operating freely. Do not remove hinge screws after initial insertion. Shims used for alignment purposes must be inserted between hinge and frame. Do not insert shims between hinge and door.
- B. To prevent stile failure, ensure that door closers are properly adjusted and do not limit the door opening swing. Limit door opening swing only with a properly located stop.
- C. Finished Doors: Replace doors that are damaged or 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 081416