SECTION 064216 - FLUSH WOOD PANELING

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

Review requirements of the Architectural Woodwork Institute (AWI) "Architectural Woodwork Standards" (hereafter, AWS) before revising this Section.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Shop finishing.

Flush wood paneling (wood-veneer wall surfacing).

Fire-retardant-treated materials.

* + - * 1. Related Requirements:

Retain subparagraphs below to cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 057000 "Decorative Metal" for metal reveals at wood paneling.

[**Section 061000 "Rough Carpentry"**] [**Section 061053 "Miscellaneous Rough Carpentry"**] for wood furring, blocking, shims, and hanging strips required for installing paneling that is concealed within other construction before paneling installation.

* + - 1. COORDINATION
				1. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that paneling can be installed as indicated.
			2. REFERENCES
				1. Architectural Woodwork Standards (including errata to date) by the Architectural Woodwork Institute (AWI).
			3. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

If needed, insert list of conference participants.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Retain subparagraph below for fire-retardant-treated materials.

Include data for fire-retardant treatment from chemical-treatment manufacturer and certification by treating plant that treated materials comply with requirements.

* + - * 1. Sustainable Design Submittals:
				2. Shop Drawings: For flush wood paneling.

Include plans, elevations, sections, and attachment details.

Retain first subparagraph below for ornate or complex work.

Show details full size.

Show locations and sizes of furring and blocking, including concealed blocking specified in other Sections.

For paneling produced from premanufactured sets, show finished panel sizes, set numbers, sequence numbers within sets, and method of cutting panels to produce indicated sizes.

Retain first subparagraph below for sequence-matched paneling laid up from loose veneers rather than made from premanufactured panels.

For paneling veneered in fabrication shop, show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.

Retain subparagraph below and applicable option if retaining other requirements for AWI's or WI's quality certification program.

Apply AWI Quality Certification Program label to Shop Drawings.

Retain "Samples" Paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples: For each exposed product and for each color and finish specified, in manufacturer's or fabricator's standard size.
				2. Samples for Initial Selection: For each type of exposed finish.
				3. Samples for Verification: For the following:

Retain "Lumber for Transparent Finish," "Veneer Leaves," and "Veneer-Faced Panel Products for Transparent Finish" subparagraphs below to control grain character, color, and finish, or insert other subparagraphs to suit Project. AWS requires samples to be "as wide as practical" by 12 inches (300 mm) long for lumber and 12 by 12 inches (300 by 300 mm) for panel products.

Lumber for Transparent Finish: Not less than 5 inches wide by 12 inches long, for each species and cut, finished on one side and one edge.

Veneer Leaves: Representative of and selected from flitches to be used for transparent-finished paneling.

Veneer-Faced Panel Products for Transparent Finish: 12 by 12 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.

Coordinate "Qualification Data" Paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.

Retain "Product Certificates" Paragraph below to require submittal of product certificates from manufacturers.

* + - * 1. Product Certificates: For each type of product.

Design Consultant to review code references and verify that the referenced sections/tables are current. Note that code references shall be based on the current version of the Uniform Code.

Retain "Evaluation Reports" Paragraph below for fire-retardant-treated materials.

* + - * 1. Evaluation Reports: For fire-retardant-treated materials, from ICC-ES.
			1. QUALITY ASSURANCE
				1. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

Retain "Shop Certification" Subparagraph below if AWI quality certification or WI compliance certification is required. Both AWI and WI will inspect work and provide certification for work that passes inspection if fabricator is not certified/licensed.

Shop Certification: AWI's Quality Certification Program accredited participant.

Retain "Installer Qualifications" Paragraph below if required. If AWI Quality Certification Program labels or certificates are required for installation, Installer must be a certified participant. If paneling must be FSC certified, fabricator must install paneling or be FSC certified for chain of custody.

* + - * 1. Installer Qualifications: Fabricator of products.
				2. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Build mockups of [**typical paneling as shown on Drawings**].

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Do not deliver paneling until painting and similar operations that might damage paneling have been completed in installation areas. Store paneling in installation areas or in areas where environmental conditions comply with requirements specified in "Field Conditions" Article.
			2. FIELD CONDITIONS

Retain "Environmental Limitations without Humidity Control" Paragraph below if humidity will not be controlled after building is occupied.

* + - * 1. Environmental Limitations without Humidity Control: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.
				2. Environmental Limitations with Humidity Control: Do not deliver or install paneling until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature between 60 and 90 deg F and relative humidity between 25 and 55 percent during the remainder of the construction period.

Retain "Field Measurements" or "Established Dimensions" Paragraph below. Establishing dimensions allows paneling fabrication to begin before installation areas are complete.

* + - * 1. Field Measurements: Where paneling is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

Locate concealed framing, blocking, and reinforcements that support paneling by field measurements before being enclosed/concealed by construction and indicate measurements on Shop Drawings.

* + - * 1. Established Dimensions: Where paneling is indicated to fit to other construction, establish dimensions for areas where woodwork is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PANELING FABRICATORS
				1. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of paneling [**and**] [**wood-veneer-faced architectural cabinets**] [**ornamental woodwork**] [**wood trim**] [**wood frames**] [**and**] [**wood doors faced with veneers from same flitches as paneling**].
			2. PANELING, GENERAL
				1. Quality Standard: Unless otherwise indicated, comply with the "Architectural Woodwork Standards" for grades of flush wood paneling (wood-veneer wall surfacing) indicated for construction, finishes, installation, and other requirements.
			3. FLUSH WOOD PANELING (WOOD-VENEER WALL SURFACING)
				1. Grade: Custom.

Options in "Wood Species and Cut" Paragraph below are examples only. Revise to suit Project.

* + - * 1. Wood Species and Cut: [**White oak, rift sliced**] [**Select white ash, plain sliced**] [**Sycamore, plain sliced**] [**Cherry, plain sliced**] [**Butternut, plain sliced**] [**Avodire, quarter sliced**].

See AWS for explanation and diagrams of different types of matching.

* + - * 1. Veneer Matching Method:

Retain "Adjacent Veneer Leaves" and "Within Panel Face" subparagraphs below, or retain "Adjacent Veneer Leaves and within Panel Face" Subparagraph below.

Adjacent Veneer Leaves: [**Book**] [**Slip**] [**Pleasing (Random)**] match.

Within Panel Face: [**Running**] [**Balance**] [**Center-balance**] match.

Adjacent Veneer Leaves and within Panel Face: Slip, center-balance, or book match.

* + - * 1. Panel-Matching Method:

Retain first subparagraph below for limited aesthetic control of Economy-grade paneling.

No matching is required between adjacent panels. Select and arrange panels for similarity of grain pattern and color between adjacent panels.

Retain subparagraph below for Custom- or Premium-grade paneling. Options are arranged in order of increasing cost. Last two options apply to Premium grade.

[**Premanufactured panel sets used full width**] [**Premanufactured panel sets selectively reduced in width**] [**Made-to-order, sequence-matched panels**] [**Made-to-order, blueprint-matched panels and components**] within each separate area.

Retain "Vertical Panel-Matching Method" Paragraph below if panels are arranged two or more panels high. See the Evaluations. If vertical matching is required because of high ceiling height, verify availability of flitches with sufficient length before retaining first option.

* + - * 1. Vertical Panel-Matching Method: [**Continuous end match; veneer leaves of upper panels are continuations of veneer leaves of lower panels**] [**Architectural end book match; veneer leaves are individually book matched from lower panels to upper panels**] [**Architectural end slip match; veneer leaves are individually slip matched from lower panels to upper panels**] [**Panel end book match; panels are book matched from lower panels to upper panels**] [**Panel end slip match; panels are slip matched from lower panels to upper panels**].
				2. Panel Core Construction: [**Hardwood veneer-core plywood**] [**Particleboard or MDF**] [**Fire-retardant particleboard or fire-retardant MDF**].

Thickness: [**3/4 inch**] [**As indicated on Drawings**].

Options in "Exposed Panel Edges" and "Panel Reveals" paragraphs below are examples only; revise to suit Project. If retaining metal edges or reveals, consider copying finish information from Section 057000 "Decorative Metal" into descriptions.

* + - * 1. Exposed Panel Edges: [**Inset solid-wood or wood-veneer matching faces**] [**Legs of metal channels forming reveals**] [**Applied solid-wood banding 11/16 inch thick by depth of panels**] [**Applied bronze flat bars 1/16 inch thick by depth of panels**].
				2. Panel Reveals: [**Matte black plastic laminate**] [**Bronze sheet**] [**Stainless steel sheet**] [**Bronze channels, 1 by 1 by 1/8 inch thick**] [**Stainless steel channels, 1 by 1 by 1/16 inch thick**] <**Insert description**>.

Retain "Fire-Retardant-Treated Paneling" Paragraph below if applicable.

* + - * 1. Fire-Retardant-Treated Paneling: Panels shall consist of wood-veneer and fire-retardant particleboard or fire-retardant, medium-density fiberboard (MDF). Panels shall have a flame-spread index of 25 or less and a smoke-developed index of 450 or less per ASTM E84, and be listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction.
				2. Assemble panels by gluing and concealed fastening.
			1. MATERIALS
				1. Materials, General: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.
				2. Wood Moisture Content: 5 to 10 percent.
				3. Composite Wood Products: Provide materials that comply with requirements of referenced quality standard for each quality grade specified unless otherwise indicated.

Particleboard (Medium Density): ANSI A208.1, [**Grade M-2**] [**Grade M-2-Exterior Glue**].

The term "plywood" in "Veneer-Faced Panel Products (Hardwood Plywood)" Subparagraph below refers to a wood-based panel with veneers applied to both faces; core may be made up of veneers (either hardwood or softwood), particleboard, MDF, hardboard, or glued-up lumber.

Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1.

* + - 1. FIRE-RETARDANT-TREATED MATERIALS

If fire-retardant materials are required, verify requirements and acceptability of various materials with authorities having jurisdiction.

* + - * 1. Fire-Retardant-Treated Materials, General: Where fire-retardant-treated materials are indicated, use materials that are acceptable to authorities having jurisdiction and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.

Use treated materials that comply with requirements of referenced quality standard. Do not use materials that are warped, discolored, or otherwise defective.

Use fire-retardant-treatment formulations that do not bleed through or otherwise adversely affect finishes. Do not use colorants to distinguish treated materials from untreated materials.

Identify fire-retardant-treated materials with appropriate classification marking of qualified testing agency in the form of removable paper label or imprint on surfaces that will be concealed from view after installation.

* + - * 1. Fire-Retardant-Treated Lumber and Plywood: Products with a flame-spread index of 25 or less when tested according to ASTM E84, with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet beyond the centerline of the burners at any time during the test.

Kiln-dry lumber and plywood after treatment to a maximum moisture content of 19 and 15 percent, respectively.

Retain first subparagraph below if items are to receive a stained or natural finish. Organic resin treatment is more expensive than salt treatments but helps ensure a better stained or natural finish.

For items indicated to receive a stained or natural finish, use organic resin chemical formulation.

Retain one of two subparagraphs below. Before retaining first, verify that wood species and treatment process specified are approved for milling after treatment.

Mill lumber after treatment within limits set for wood removal that do not affect listed fire-test-response characteristics, using a woodworking shop certified by testing and inspecting agency.

Mill lumber before treatment and implement procedures during treatment and drying processes that prevent lumber from warping and developing discolorations from drying sticks or other causes, marring, and other defects affecting appearance of paneling.

Fire-retardant particleboard contains urea formaldehyde. It complies with requirements for Class I (Class A) finish but not with requirements of model codes for use where noncombustible materials are required.

* + - * 1. Fire-Retardant Particleboard: Made from softwood particles and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 25 or less per ASTM E84.

For panels 3/4 inch thick and less, comply with ANSI A208.1 for Grade M-2 except for the following minimum properties: modulus of rupture, 1600 psi; modulus of elasticity, 300,000 psi; internal bond, 80 psi; and screw-holding capacity on face and edge, 250 and 225 lbf, respectively.

For panels 13/16 to 1-1/4 inches thick, comply with ANSI A208.1 for Grade M-1 except for the following minimum properties: modulus of rupture, 1300 psi; modulus of elasticity, 250,000 psi; linear expansion, 0.50 percent; and screw-holding capacity on face and edge, 250 and 175 lbf, respectively.

Fiberboard in "Fire-Retardant Fiberboard" Paragraph below complies with requirements for Class I (Class A) finish but not with requirements of model codes for use where noncombustible materials are required.

* + - * 1. Fire-Retardant Fiberboard: MDF panels complying with ANSI A208.2, made from softwood fibers, synthetic resins, and fire-retardant chemicals mixed together at time of panel manufacture to achieve flame-spread index of 25 or less and smoke-developed index of 200 or less per ASTM E84.
			1. INSTALLATION MATERIALS
				1. Furring, Blocking, Shims, and Hanging Strips: [**Softwood or hardwood lumber**] [**Fire-retardant-treated softwood lumber**], kiln-dried to less than 15 percent moisture content.
				2. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide metal expansion sleeves or expansion bolts for post-installed anchors. Use nonferrous-metal or hot-dip galvanized anchors and inserts at inside face of exterior walls.
				3. Installation Adhesive: Product recommended by panel fabricator for each substrate for secure anchorage.

Subparagraph below applies to LEED 2009 for Schools Credit IEQ 4.1.

* + - 1. FABRICATION
				1. Sand fire-retardant-treated wood lightly to remove raised grain on exposed surfaces before fabrication.

Retain first paragraph below if Director’s Representative's approval of panel layout is required. Sequenced sets of veneer cannot be rearranged except for reversing or exchanging with a different set, and premanufactured panel sets cannot be rearranged but can only be exchanged for different sets.

* + - * 1. Arrange paneling in shop or other suitable space in proposed sequence for examination by Director’s Representative. Mark units with temporary sequence numbers to indicate position in proposed layout.

Lay out one elevation at a time if approved by Director’s Representative.

Notify Director’s Representative seven days in advance of the date and time when layout will be available for viewing.

Provide lighting of similar type and level as that of final installation for viewing layout unless otherwise approved by Director’s Representative.

Rearrange paneling as directed by Director’s Representative until layout is approved.

Retain first subparagraph below if practical for maximum flexibility in rearranging layout.

Do not trim end units and other nonmodular-size units to less than modular size until after Director’s Representative's approval of layout.

Obtain Director’s Representative's approval of layout before start of assembly. Mark units and Shop Drawings with assembly sequence numbers based on approved layout.

* + - * 1. Complete fabrication, including assembly, to maximum extent possible, before shipment to Project site. Disassemble components only as necessary for shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

Retain subparagraph below if Director’s Representative will examine paneling in woodwork shop before it is shipped to Project site.

Notify Director’s Representative seven days in advance of the dates and times paneling fabrication will be complete.

* + - * 1. Shop cut openings, to maximum extent possible, to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
			1. SHOP FINISHING

Retain "General" or "Shop Priming" Paragraph below to indicate extent of shop finishing required.

* + - * 1. General: Finish paneling at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.
				2. Shop Priming: Shop apply the prime coat including backpriming, if any, for paneling specified to be field finished. See Section 099300 "Staining and Transparent Finishing" for material and application requirements.
				3. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing paneling, as applicable to each unit of work.

Generally retain "Backpriming" Subparagraph below.

Backpriming: Apply two coats of sealer or primer, compatible with finish coats, to concealed surfaces of paneling.

* + - * 1. Transparent Finish:

Grade: Custom.

Review AWS for general performance characteristics of finishing systems. In general, System - 4 has best resistance to yellowing; System - 5 is a durable, repairable, and good general-purpose fine finish; System - 7 is durable and has good chemical resistance; System - 11 is very durable but not easily repaired; and System - 13 can have high gloss (wet look), requires special care in applying, and is not generally repairable.

Finish: System - [**1, nitrocellulose lacquer**] [**2, precatalyzed lacquer**] [**3, postcatalyzed lacquer**] [**4, water-based latex acrylic**] [**5, conversion varnish**] [**6, synthetic penetrating oil**] [**7, catalyzed vinyl**] [**8, water-based crosslinking acrylic**] [**9, UV curable acrylated epoxy, polyester, or urethane**] [**10, water-based UV curable**] [**11, catalyzed polyurethane**] [**12, water-based polyurethane**] [**13, catalyzed polyester**].

Wash coat helps prevent blotchiness with wiping stains.

Wash Coat for Closed-Grain Woods: Apply wash-coat sealer to woodwork made from closed-grain wood before staining and finishing.

Staining: [**None required**] [**Match approved sample for color**] [**Match Director’s Representative's sample**].

Retain "Open Finish for Open-Grain Woods" or "Filled Finish for Open-Grain Woods" Subparagraph below if using open-grain wood.

Open Finish for Open-Grain Woods: Do not apply filler to open-grain woods.

Retain option in "Filled Finish for Open-Grain Woods" Subparagraph below for highest-quality work to prevent solvent in filler from smearing stain.

Filled Finish for Open-Grain Woods:[**After staining, apply wash-coat sealer and allow to dry.**] Apply paste wood filler and wipe off excess. Tint filler to match stained wood.

Numerical values for gloss ratings in "Sheen" Subparagraph below correspond with AWS; coordinate with effect and finish system required. Retain flat sheen with oil finish.

Sheen: [**Flat, 15-30**] [**Satin, 31-45**] [**Semigloss, 46-60**] [**Gloss, 61-100**] gloss units measured on 60-degree gloss meter per ASTM D523.

1. EXECUTION
	* + 1. PREPARATION
				1. Before installation, condition paneling to humidity conditions in installation areas.
				2. Before installing paneling, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.
			2. INSTALLATION

Revise "Grade" Paragraph below if installation grade is different from fabrication grade.

* + - * 1. Grade: Install paneling to comply with quality standard grade of paneling to be installed.
				2. Install paneling level, plumb, true in line, and without distortion. Shim as required with concealed shims. Install level and plumb to a tolerance of 1/8 inch in 96 inches. Install with no more than 1/16 inch in 96-inch vertical cup or bow and 1/8 inch in 96-inch horizontal variation from a true plane.

For flush paneling with revealed joints, install with variations in reveal width, alignment of top and bottom edges, and flushness between adjacent panels not exceeding [**1/32 inch**] [**1/16 inch**].

Retain first paragraph below except for economy work that is face nailed or adhesively applied.

* + - * 1. Anchor paneling to supporting substrate with [**concealed panel-hanger clips**] [**splined connection strips**] [**blind nailing**].

Do not use face fastening unless [**covered by trim**] [**otherwise indicated**].

Retain one of two paragraphs below; coordinate with selections made in "Shop Finishing" Article.

* + - * 1. Complete finishing work specified in this Section to extent not completed at shop or before installation of paneling. Fill nail holes with matching filler where exposed.

Apply specified finish coats, including stains and paste fillers if any, to exposed surfaces where only sealer/prime coats are shop applied.

* + - * 1. See Section 099300 "Staining and Transparent Finishing" for final finishing of installed paneling.
			1. ADJUSTING AND CLEANING
				1. Repair damaged and defective paneling, where possible, to eliminate defects. Where not possible to repair, replace paneling. Adjust for uniform appearance.
				2. Clean paneling on exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 064216