SECTION 064214 - STILE AND RAIL 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:

Stile and rail wood paneling for transparent finish.

Stile and rail wood paneling for opaque finish.

Wood furring, blocking, shims, and hanging strips for installing stile and rail wood paneling that are not concealed within other construction.

Shop finishing.

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

Section 064023 "Interior Architectural Woodwork" for wood trim installed on or next to stile and rail wood paneling.

* + - 1. REFERENCES
         1. Architectural Woodwork Standards (including errata to date) by the Architectural Woodwork Institute (AWI).
      2. 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.
      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 stile and rail 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," "Lumber and Panel Products with Shop-Applied Opaque Finish," and "Corner Pieces" 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.

Lumber and Panel Products with Shop-Applied Opaque Finish: 5 inches wide by 12 inches long for lumber and 12 by 12 inches for panels.

Provide Samples with exposed surface finished for each finish system.

Corner Pieces: 18 inches high by 18 inches wide by 6 inches deep.

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 stile and rail wood 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 stile and rail wood paneling (stile and rail wall surfacing) indicated for construction, finishes, installation, and other requirements.
      3. STILE AND RAIL WOOD PANELING FOR TRANSPARENT FINISH
         1. Grade: Custom.

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

* + - * 1. Wood Species: [**White oak, rift sawn/sliced**] [**Figured English ash, quarter sawn/sliced**] [**Butternut, plain sawn/sliced**] [**Figured red gum, plain-sawn/sliced panels, quarter-sawn/sliced stiles and rails**].

Retain "Stiles and Rails" Paragraph below for expensive woods and woods that swell and shrink appreciably with changes in humidity; delete for less-expensive hardwoods and for softwoods.

* + - * 1. Stiles and Rails: At fabricator's option, stiles and rails may be either lumber or veneered construction with edges banded or with lumber moldings, as indicated, to conceal core and veneer joints.
        2. Panels: [**Flat panels**] [**Raised panels with veneered faces and solid-lumber rims**] [**Raised panels with veneered faces extending across rims**] [**Raised panels made from edge-glued solid lumber**].

The first three paragraphs below are examples of choices for insert panelmatch control applicable to veneered panels. The strength of grain character and quality of work should determine the level of control needed. Retain one paragraph or delete all if edge-glued solid panels are used.

* + - * 1. Blueprint Matched Insert Panels: Blueprint matched in a horizontal sequence for adjacent panels and doors, with continuous vertical matching between adjacent panels. [**Book and balance**] [**Book, balance, and center**] match face-veneer leaves within each panel.

Retain "Sequence Matched Insert Panels" Paragraph below after determining that premanufactured sets of species, cut, and volume needed are available. Premanufactured sets are not available for softwoods or rare imported woods.

* + - * 1. Sequence Matched Insert Panels: Cut panels from premanufactured, sequence-matched sets of book-matched veneered panels. Cut panels with veneer leaves centered in each panel. Cut panels with continuous matching between vertically adjacent panels; veneer leaves of upper panels are continuations of veneer leaves of panels below them.

Veneer Leaves: [**Even**] [**or**] [**odd**] in number.

Remainders: At least half as wide as the full veneer leaves.

* + - * 1. Book and Balance Matched Insert Panels: Book and balance match face veneers within panels. No matching is required between adjacent panels; select and arrange panels for similarity of grain pattern and color between adjacent panels.
        2. Shop assemble stile and rail paneling into largest units practical for delivery and installation. Provide shop-prepared detachable joints for necessary field connections. Sand and pull joints tight in shop so field joints will comply with joint tolerances for specified grade. Unless otherwise indicated, provide continuous mortise-and-tenon joints between panel units and provide removable temporary protection for joints during handling and delivery.

Outside Corner of Stile and Rail Paneling: Shop prepare using lock-mitered[**or mitered-and-splined**] construction. Assemble, sand, and glue in shop if site conditions permit.

* + - 1. STILE AND RAIL WOOD PANELING FOR OPAQUE FINISH
         1. Grade: Custom.

Options in "Wood Species" Paragraph below are examples of woods for stile and rail wood paneling. Revise to suit Project.

* + - * 1. Wood Species: Any closed-grain hardwood.

Retain "Stiles and Rails," "Flat Insert Panels," and "Raised Insert Panels" paragraphs below if fire-retardant treatment is not required.

* + - * 1. Stiles and Rails: Either solid lumber or particleboard, shop filled on face, with veneered or lumber-banded edges, at paneling fabricator's option.
        2. Flat Insert Panels: MDF or particleboard with shop-filled face.
        3. Raised Insert Panels: [**Medium-density overlaid softwood plywood (exterior), machined to profile indicated and shop filled on exposed machined surfaces**] [**MDF, machined to profile indicated**].
        4. Provide fire-retardant treatment of stile and rail paneling as indicated below. For components of paneling fabricated from solid lumber, mill pieces before treatment.

Stiles and Rail Components: [**Fire-retardant-treated lumber**] [**fire-retardant MDF**] [**or**] [**fire-retardant particleboard with fire-retardant-lumber edge bands**].

Insert Panels: [**Fire-retardant MDF**] [**or**] [**fire-retardant particleboard with closed-grain hardwood veneer on face and back**].

* + - * 1. Shop assemble stile and rail paneling into largest units practical for delivery and installation. Provide shop-prepared detachable joints for necessary field connections. Sand and pull joints tight in shop so field joints will comply with joint tolerances for specified grade. Unless otherwise indicated, provide continuous mortise-and-tenon joints between panel units and provide removable temporary protection for joints during handling and delivery.

Outside Corner of Stile and Rail Paneling: Shop prepare using lock-mitered[**or mitered-and-splined**] construction. Assemble, sand, and glue in shop if site conditions permit.

* + - 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.

MDF: ANSI A208.2, Grade 130.

Particleboard: 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. Verify compatibility of fire-retardant treatments with specified finishes.

* + - * 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: Medium-density 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.[**Indicate trimming by masking edges of units with nonmarking material.**]

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 first 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.

Retain subparagraph below for high-quality stile and rail paneling.

Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that parts fit as intended and check measurements of assemblies against field measurements indicated on approved Shop Drawings before disassembling for shipment.

* + - * 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 one of three "General" paragraphs below to indicate extent of shop finishing required. First paragraph requires all work to be shop finished.

* + - * 1. General: Finish paneling at fabrication shop as specified in this Section. Defer only final touchup, cleaning, and polishing until after installation.

Retain first "General" Paragraph below if both painted and transparent finishes are used and if only transparent finish is shop applied.

* + - * 1. General: Shop finish transparent-finished paneling at fabrication shop as specified in this Section. See Section 099123 "Interior Painting" for field finishing of opaque-finished paneling.

Retain "General" Paragraph below if both shop-finished and field-finished paneling is required and Drawings indicate which items are required to be shop finished.

* + - * 1. General: Drawings indicate paneling that is required to be shop finished. Finish shop-finished paneling at fabrication shop as specified in this Section. Refer to [**Section 099123 "Interior Painting"**] [**and**] [**Section 099300 "Staining and Transparent Finishing"**] for field finishing paneling not indicated to be shop finished.

Retain "Shop Priming" Paragraph below if field-finished paneling is required to be shop primed.

* + - * 1. Shop Priming: Shop apply the prime coat including backpriming, if any, for transparent-finished paneling specified to be field finished.

See [**Section 099123 "Interior Painting"**] [**and**] [**Section 099300 "Staining and Transparent Finishing"**] for material and application requirements.

* + - * 1. 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 the 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 a 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 cross linking 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. Opaque Finish:

Grade: Custom.

Review AWS for general performance characteristics of finishing systems. In general, 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 a 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**] [**7, catalyzed vinyl**] [**8, water-based cross linking acrylic**] [**9, UV curable acrylated epoxy, polyester, or urethane**] [**10, water-based UV curable**] [**11, catalyzed polyurethane**] [**12, water-based polyurethane**] [**13, catalyzed polyester**].

If retaining first option in "Colors" Subparagraph, indicate colors in a separate schedule.

Colors: [**As indicated by manufacturer's designations**] [**Match Director’s Representative's samples**] [**As selected by Director’s Representative from manufacturer's full range**].

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

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.

Retain first paragraph below if required.

* + - * 1. Scribe and cut paneling to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

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.

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 099123 "Interior Painting"**] [**and**] [**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 functional and visual 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 064214