SECTION 096400 - WOOD FLOORING

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.

1. GENERAL
	* + 1. SUMMARY
				1. Section Includes:

Factory**-**finished wood flooring.

Field-finished wood flooring.

Sound control underlayment.

* + - * 1. Related Requirements:

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

Section 096466 "Wood Athletic Flooring" for wood resilient systems used in sports-activity areas.

* + - 1. DEFINITIONS
				1. MFMA – Maple Flooring Manufacturers Association.
				2. NWFA – National Wood Floors Association.
				3. PLIB – Pacific Lumber Inspection Bureau.
				4. WCLIB – West Coast Lumber Inspection Bureau.
			2. 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.
				5. Sustainable Design Submittals:
				6. Shop Drawings: For each type of floor assembly and accessory. Include plans, sections, and attachment details. Include expansion provisions and trim details. Show direction of flooring and details at walls, doorways and openings, and obstructions interrupting flooring.

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 texture specified, approximately 12 inches long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.
				2. Samples for Initial Selection: Manufacturer's color charts showing the full range of colors and finishes available for wood flooring.

Include Samples of accessories involving color and finish selection.

* + - * 1. Samples for Verification: For each type of wood flooring and accessory, with stain color and finish required, approximately 12 inches long and of same thickness and material indicated for the Work and showing the full range of normal color and texture variations expected.
			1. QUALITY ASSURANCE

Retain "Mockups" paragraph below if required. Indicate portion of flooring represented by mockup on Drawings or draw mockup as separate element.

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

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Director’s Representative specifically approves such deviations in writing.

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. Deliver wood flooring materials in unopened cartons or bundles.
				2. Protect wood flooring from exposure to moisture. Do not deliver wood flooring until after concrete, masonry, plaster, ceramic tile, and similar wet-work is complete and dry.
				3. Store wood flooring materials in a dry, warm, ventilated, weathertight location.
			2. FIELD CONDITIONS

Conditioning requirements in first two paragraphs below may not be required for engineered-wood flooring products; verify with manufacturer.

* + - * 1. Conditioning period begins not less than seven days before wood flooring installation, is continuous through installation, and continues not less than seven days after wood flooring installation.

Environmental Conditioning: Maintain ambient temperature between 65 and 75 deg F and relative humidity planned for building occupants in spaces to receive wood flooring during the conditioning period.

Wood Flooring Conditioning: Move wood flooring into spaces where it will be installed, no later than the beginning of the conditioning period.

Do not install flooring until it adjusts to relative humidity of, and is at same temperature as, space where it is to be installed.

Open sealed packages to allow wood flooring to acclimatize immediately on moving flooring into spaces in which it will be installed.

* + - * 1. After conditioning period, maintain relative humidity and ambient temperature planned for building occupants.
				2. Scheduling: Do not perform the Work of this Section until all trades have completed all items above the floor area.
				3. Install factory-finished wood flooring after other finishing operations, including painting, have been completed.
				4. Finish field-finished wood flooring after other finishing operations, including painting, have been completed. Do not apply finish in areas where dust is being generated or will be generated while the finish is drying.

For a descriptive specification, consider inserting a "Warranty" Article here. Manufacturers' warranties vary.

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. PERFORMANCE REQUIREMENTS
				1. Hardwood Flooring: Comply with NWFA A500 for species, grade, and cut.

Retain "Certification" subparagraph below if required. Only NWFA members can use grade stamp; however, nonmembers may comply with grading rules.

Certification: Provide flooring that carries NWFA grade stamp on each bundle or piece.

* + - * 1. Maple Flooring: Comply with applicable MFMA grading rules for species, grade, and cut.

Retain "Certification" subparagraph below if required. Only MFMA members can use mark; however, nonmembers may comply with grading rules.

Certification: Provide flooring that carries MFMA mark on each bundle or piece.

* + - * 1. Softwood Flooring: Comply with PLIB/WCLIB No. 17 grading rules for species, grade, and cut.
			1. FIELD-FINISHED WOOD FLOORING
				1. Solid-Wood Flooring: Kiln dried to 6 to 9 percent maximum moisture content; tongue and groove and end matched; with backs channeled.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11581) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

AHF Products, LLC.

[Aacer Flooring, LLC](http://www.specagent.com/Lookup?uid=123457128724).

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128725).

Shaw Industries Group, Inc.

[WD Flooring, LLC](http://www.specagent.com/Lookup?uid=123457128722).

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every grade, species, cut, thickness, and face width is available from all listed manufacturers.

Grade and Species: [**Clear red oak**] [**Select red oak**] [**No. 1 Common red oak**] [**No. 2 Common red oak**] [**MFMA-RL First Grade hard maple**] [**MFMA-RL Second and Better Grade hard maple**] [**Grade C & BTR - Flooring Douglas fir**] [**Grade D - Flooring Douglas fir**].

Cut: [**Plain sawn**] [**Quarter/rift sawn**] [**Edge grain**] [**Vertical grain**].

Thickness: [**25/32 inch**] [**3/4 inch**].

Face Width: [**2-1/4 inches**] [**3-1/8 inches**] [**5-1/8 inches**].

Lengths: [**Manufacturer's standard**] [**Random-length strips complying with applicable grading rules**] [**Lengths required to form pattern indicated**].

Retain "Simulated Wood Pegs" subparagraph below if required for plank flooring.

Simulated Wood Pegs: Contrasting wood pegs at ends of flooring pieces.

* + - * 1. Solid-Wood Parquet Flooring: Kiln dried to 6 to 9 percent maximum moisture content.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11761) Subject to compliance with requirements, provide products by the following:

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128727).

Czar Floor Inc.

Oshkosh Designs.

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every species, grade, and thickness is available from all listed manufacturers.

Species: [**Red oak**] [**White oak**] [**Ash**] [**Maple**] [**Black cherry**].

Grade: <**Insert grade**>.

Thickness: [**5/16 inch**] [**11/16 inch**] [**1/4 inch**].

Pattern: <**Insert description**>.

Size: <**Insert dimension**>.

* + - * 1. Engineered-Wood Flooring: HPVA EF[**, complying with requirements for composite wood products**].

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11760) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

AHF Products, LLC.

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128702).

Shaw Industries Group, Inc.

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every species, grade, thickness, and face width is available from all listed manufacturers.

Species: [**Red oak**] [**White oak**] [**Ash**] [**Beech**] [**Maple**] [**Black cherry**] <**Insert species**>.

Grade: <**Insert grade**>.

Thickness: [**1/2 inch**] [**3/8 inch**] <**Insert dimension**>.

Construction: [**Five**] [**Three**] ply.

Face Width: [**2-1/4 inches**] [**3 inches**] <**Insert dimension**>.

Length: Manufacturer's standard.

* + - * 1. Urethane Finish System: Complete water-based system of compatible components that is recommended by finish manufacturer for application indicated.

[Products:](http://www.specagent.com/Lookup?ulid=11762) Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to the following:

[Absolute Coatings, Inc](http://www.specagent.com/Lookup?uid=123457128708).; Last N Last LNL-1500 Commercial Wood Floor Finish.

[BonaKemi USA Inc](http://www.specagent.com/Lookup?uid=123457128704); Bona Traffic HD®.

[MAPEI Corporation](http://www.specagent.com/Lookup?uid=123457128709); Ultracoat High Traffic.

Approved equivalent.

Stain: Penetrating and nonfading type.

Color: [**Match sample**] [**As selected by Director’s Representative from manufacturer's full range**].

Floor Sealer: Pliable, penetrating type.

Finish Coats: Formulated for multicoat application on wood flooring.

Wood filler is formulated to fill and repair seams and defects and to fill open-grain hardwood floors.

* + - * 1. Wood Filler: Compatible with finish system components and recommended by filler and finish manufacturers for use indicated. If required to match approved Samples, provide pigmented filler.
			1. FACTORY-FINISHED WOOD FLOORING
				1. Solid-Wood Flooring: Kiln dried to 6 to 9 percent maximum moisture content; tongue and groove and end matched; with backs channeled.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11763) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Aacer Flooring, LLC](http://www.specagent.com/Lookup?uid=123457128710).

AHF Products, LLC.

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128717).

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every species, grade, cut, thickness, and face width is available from all listed manufacturers.

Species: [**Red oak**] [**White oak**] [**Ash**] [**Birch**] [**Maple**] [**Black cherry**] [**Hickory**] [**Walnut**].

Grade: <**Insert grade**>.

Cut: [**Plain sawn**] [**Quarter/rift sawn**] [**Edge grain**] [**Vertical grain**].

Thickness: [**3/4 inch**] [**25/32 inch**].

Face Width: [**2-1/4 inches**] [**3-1/8 inches**] [**5-1/8 inches**].

Lengths: [**Random-length strips complying with applicable grading rules**] [**Lengths required to form pattern indicated**].

Edge Style: [**Square**] [**Beveled (eased)**].

Finish: UV urethane.

Color: [**As selected by Director’s Representative from manufacturer's full range**].

* + - * 1. Solid-Wood Parquet Flooring: Kiln dried to 6 to 9 percent maximum moisture content.

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11764) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128730).

Czar Floor Inc.

Oshkosh Designs.

Saroyan Hardwoods.

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every species, grade, and thickness is available from all listed manufacturers.

Species: Red oak.

Grade: <**Insert grade**>.

Thickness: [**5/16 inch**] [**11/16 inch**] [**1/4 inch**] <**Insert dimension**>.

Edge Style: <**Insert style**>.

Pattern: <**Insert description**>.

Size: <**Insert dimension**>.

Coordinate option retained in "Finish" subparagraph below with products and manufacturers retained.

Finish: [**UV urethane**] [**Acrylic impregnated**].

Color: [**As selected by Director’s Representative from manufacturer's full range**].

* + - * 1. Engineered-Wood Flooring: HPVA EF[**, complying with requirements for composite wood products**].

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11765) Subject to compliance with requirements, provide products by the following:

AHF Products, LLC.

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128697).

Shaw Industries Group, Inc.

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every species, grade, thickness, and face width is available from all listed manufacturers.

Species: [**Red oak**] [**White oak**] [**Ash**] [**Beech**] [**Birch**] [**Maple**] [**Black cherry**] [**Hickory**] [**Walnut**].

Grade: <**Insert grade**>.

Thickness: [**1/2 inch**] [**3/8 inch**].

Construction: [**Five**] [**Three**] ply.

Face Width: [**2-1/4 inches**] [**3 inches**].

Length: Manufacturer's standard.

Edge Style: [**Square**] [**Beveled (eased)**].

Coordinate option retained in "Finish" subparagraph below with products and manufacturers retained.

Finish: [**UV urethane**] [**Acrylic impregnated**].

Color: [**As selected by Director’s Representative in manufacturer's full range**].

* + - * 1. Engineered-Wood Parquet Flooring: HPVA EF[**, complying with requirements for composite wood products**].

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11766) Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

[Carlisle Wide Plank Floors](http://www.specagent.com/Lookup?uid=123457128732).

Saroyan Hardwoods.

Approved equivalent.

Coordinate subparagraphs below with manufacturers retained above. Not every species, grade, and thickness is available from all listed manufacturers.

Species: [**Red oak**] [**Ash**] [**Beech**] [**Maple**] [**Walnut**].

Grade: <**Insert grade**>.

Thickness: [**3/8 inch**] [**1/2 inch**].

Construction: [**Five**] [**Three**] ply.

Edge Style: <**Insert style**>.

Pattern: <**Insert description**>.

Size: <**Insert dimension**>.

Finish: UV urethane.

Color: [**As selected by Director’s Representative from manufacturer's full range**].

* + - 1. SOUND CONTROL UNDERLAYMENT

Sound control underlayment is used to reduce impact noise when wood flooring is installed above occupiable space. Verify that underlayment is acceptable to wood flooring manufacturer.

Various materials are available; revise "Sound Control Underlayment" paragraph below to include named products and manufacturers if required.

* + - * 1. Sound Control Underlayment: Sound reducing underlayment consisting of impact-absorbing materials. Minimum Impact Insulation Class (IIC) of [**50**] [**55**] <**Insert value**> when tested according to ASTM E492.

Material: [**Recycled rubber**] [**Polyurethane foam**] [**Wood fiber**] [**Wood fiber complying with requirements for composite wood products**].

Thickness: [**3/4 inch**] [**1/2 inch**] [**3/8 inch**] [**1/4 inch**] [**5/32 inch**].

* + - 1. ACCESSORY MATERIALS

Retain "Wood Sleepers and Subfloor" and "Wood Underlayment" paragraphs below if required.

* + - * 1. Wood Sleepers and Subfloor: As specified in Section 061000 "Rough Carpentry" and Section 061600 "Sheathing."
				2. Wood Underlayment: As specified in Section 061600 "Sheathing."
				3. Vapor Retarder: ASTM D4397, polyethylene sheet not less than [**6.0 mils**] [**8.0 mils**] thick.
				4. Asphalt-Saturated Felt: ASTM D4869, Type II.
				5. Wood Flooring Adhesive: Mastic recommended by flooring and adhesive manufacturers for application indicated.
				6. Trowelable Leveling and Patching Compound: Latex-modified, hydraulic-cement-based formulation approved by wood flooring manufacturer.
				7. Fasteners: As recommended by manufacturer, but not less than that recommended in NWFA's "Installation Guidelines."
				8. Thresholds and Saddles: To match wood flooring. Tapered on each side.
				9. Reducer Strips: To match wood flooring. 2 inches wide, tapered, and in thickness required to match height of flooring.

Retain "Cork Expansion Strip," "Feature Strips," or "Metal Feature Strips" paragraph below if required.

* + - * 1. Cork Expansion Strip: Composition cork strip.
				2. Feature Strips: 2-inch- wide, square-edged walnut strips, furnished in lengths as long as practical and in thickness to match wood flooring.
				3. Metal Feature Strips: 1/8-by-1/8-inch solid-brass strips, designed for inlaying into routed reveal in wood flooring surface.
				4. Wood Air Vents and Grilles: To match wood flooring and in sizes and design indicated on Drawings.

If concealed spaces between wood flooring and fire-resistance-rated floor assemblies are fireblocked or filled with noncombustible material, insert requirements here. See "Code Requirements" Article in the Evaluations.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, installation tolerances, and other conditions affecting performance of wood flooring.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
				3. Concrete Slabs: Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.

Retain "Moisture Testing" subparagraph below; excessive moisture vapor can cause failure of systems installed on slabs-on-grade. ASTM F1869 (anhydrous calcium chloride test) and ASTM F2170 (relative humidity test) both recommend one test per 1000 sq. ft., but no fewer than three tests per test area.

Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Retain "Anhydrous Calcium Chloride Test" or "Relative Humidity Test" subparagraph below, or both.

First option in "Anhydrous Calcium Chloride Test" subparagraph below is based on NWFA recommendations and on floor-covering industry practices for adhered floor coverings to avoid adhesive failures; second option is based on MFMA recommendations. Retain the lower value if assembly components are adhered to slab; consult manufacturers for recommendations.

Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of [**3 lb of water/1000 sq. ft.**] [**4.5 lb of water/1000 sq. ft.**] in 24 hours.

MFMA recommends a maximum relative humidity level of 80 percent for concrete slabs before installation of non-adhered systems and 75 percent for adhered systems.

Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum [**80**] [**75**] percent relative humidity level measurement.

Perform additional moisture tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

If products are installed on other substrates, including existing concrete, insert examination requirements in this article and revise "Preparation" Article.

* + - 1. PREPARATION
				1. Concrete Slabs:

Grind high spots and fill low spots to produce a maximum 1/8-inch deviation in any direction when checked with a 10-foot straight edge.

Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, and depressions in substrates.

Retain subparagraph below if products are adhered to concrete substrates.

Remove coatings, including curing compounds, and other substances on substrates that are incompatible with installation adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

* + - * 1. Broom or vacuum clean substrates to be covered immediately before product installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, or dust. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. INSTALLATION
				1. Comply with flooring manufacturer's written installation instructions, but not less than applicable recommendations in NWFA's "Installation Guidelines."

Retain "Wood Sleepers and Subfloor" and "Wood Underlayment" paragraphs below if required.

* + - * 1. Wood Sleepers and Subfloor: Install according to requirements in Section 061000 "Rough Carpentry" and Section 061600 "Sheathing."
				2. Wood Underlayment: Install according to requirements in Section 061600 "Sheathing."
				3. Provide expansion space at walls and other obstructions and terminations of flooring of not less than 3/4 inch.
				4. Vapor Retarder: Comply with the following for vapor retarder installation:

Wood Flooring Nailed to Wood Subfloor: Install flooring over a layer of asphalt-saturated felt.

Wood Flooring Nailed to Sleepers over Concrete: Install flooring over a layer of polyethylene sheet with edges overlapped over sleepers and turned up behind baseboards.

Wood Flooring Installed Directly on Concrete: Install a layer of polyethylene sheet according to flooring manufacturer's written instructions.

* + - * 1. Sound Control Underlayment: Install over vapor retarder according to manufacturer's written instructions.
				2. Solid-Wood Flooring: Blind nail or staple flooring to substrate.

Retain "Plank Flooring" subparagraph below if applicable.

Plank Flooring: For flooring of face width more than 3 inches:

Retain applicable subparagraphs below based on types of plank flooring required.

Hardwood: Install countersunk screws at each end of each piece in addition to blind nailing. Cover screw heads with wood plugs glued flush with flooring.

Softwood: Install no fewer than two countersunk nails at each end of each piece, spaced not more than 16 inches along length of each piece, in addition to blind nailing. Fill holes with matching wood filler.

* + - * 1. Solid-Wood Parquet Flooring: Set in adhesive in pattern indicated on Drawings.

Retain installation method in "Engineered-Wood Flooring" paragraph below to coordinate with products in Part 2. Floating floors are not attached to other construction.

* + - * 1. Engineered-Wood Flooring: [**Set in adhesive**] [**Nail or staple**] [**Install floating floor**].
			1. FIELD FINISHING

Retain this article if wood flooring is finished on-site.

* + - * 1. Machine-sand flooring to remove offsets, ridges, cups, and sanding-machine marks that are noticeable after finishing. Vacuum and tack with a clean cloth immediately before applying finish.

Comply with applicable recommendations in NWFA's "Installation Guidelines."

* + - * 1. Fill open-grained hardwood.
				2. Fill and repair wood flooring defects.
				3. Apply floor-finish materials in number of coats recommended by finish manufacturer for application indicated, but not less than one coat of floor sealer and three finish coats.

Apply stains to achieve an even color distribution matching approved Samples.

For water-based finishes, use finishing methods recommended by finish manufacturer to minimize grain raise.

* + - * 1. Cover wood flooring before finishing.
				2. Do not cover wood flooring after finishing until finish reaches full cure, and not before seven days after applying last finish coat.
			1. PROTECTION
				1. Protect installed wood flooring during remainder of construction period with covering of heavy kraft paper or other suitable material. Do not use plastic sheet or film that might cause condensation.

Do not move heavy and sharp objects directly over kraft-paper-covered wood flooring. Protect flooring with plywood or hardboard panels to prevent damage from storing or moving objects over flooring.

END OF SECTION 096400