SECTION 073129 - WOOD SHINGLES AND SHAKES

This Section includes installation of wood shingles and shakes for sloped roof (4 on 12 min) applications or side wall applications. Edit for type required.

1. GENERAL
	* + 1. RELATED DOCUMENTS

Retain or delete this article in all Sections of Project Manual.

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

Wood roof shingles.

Shingles are sawed and have a smooth surface. Rebutted and Rejointed Shingles have machine trimmed edges and the butts are retrimmed.

Wood roof shakes.

Shakes are split and have at least one highly textured, natural grain split surface.

Underlayment[ and shake interlayment] materials.

Ridge vents.

Metal flashing and trim.

* + - 1. ABBREVIATIONS
				1. CSSB: Cedar Shake & Shingle Bureau.
			2. DEFINITIONS
				1. Roofing Terminology: See ASTM D1079 for definitions of terms related to roofing Work in this Section.
			3. REFERENCE STANDARDS
				1. RCSHSB: Red Cedar Shingle and Handsplit Shake Bureau.
				2. ASTM: American Society for Testing and Materials.
				3. UL: Underwriters Laboratories.
			4. 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.

Before the roofing Work is scheduled to commence, a conference will be called by the Director's Representative for the purpose of reviewing the Drawings and the Specifications and discussing requirements for the Work. The conference shall be attended by the Contractor, and the roofing applicator.

* + - 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. Submittals Package: Submit the product data, samples, and quality control submittals specified below at the same time as a package.
				5. Product Data: For the following:

Manufacturer’s installation instructions.

Wood roof shingles.

Wood roof shakes.

Underlayment materials.

Ridge vents.

Asphalt roofing cement.

Drainage mat.

* + - * 1. Sustainable Design Submittals:

Retain "Shop Drawings" paragraph below if Drawings do not fully detail metal flashing and trim specified in Part 2 or to verify requirements specified in Part 2.

* + - * 1. Shop Drawings: For metal flashing and trim.
				2. Samples: For each exposed product, in sizes indicated.

Wood Roof **[Shingles] [Shakes]**: one bundle of each type specified.

Nails: 3, each type.

Concealed Flashing: 6-inch square piece.

* + - * 1. Qualification Data: For Installer.
				2. Closeout Submittals

Roofing Installer's warranty.

Maintenance Material Submittals

Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Wood Roof Shingles: **[100 sq. ft.]** of each size and type, in unbroken bundles.

Wood Roof Shakes: **[100 sq. ft.]** of each size and type, in unbroken bundles.

* + - 1. QUALITY ASSURANCE

Retain "Installer Qualifications" paragraph below if requiring manufacturer's limited lifetime warranty administered by CSSB.

* + - * 1. Installer Qualifications: CSSB member.
				2. Installer Qualifications: The crew chief and at least one other member of the roofing crew shall have previously installed at least 12 wood shake or shingle roof systems and shall be thoroughly familiar with all aspects of the installation.
				3. Grading Agency Qualifications:

Shingles and shake bundles: CSSB label.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture in accordance with manufacturer's written instructions.
				2. Store underlayment rolls on end, on pallets or other raised surfaces. Do not double-stack rolls.
				3. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing Work is not in progress.
				4. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.
			2. FIELD CONDITIONS
				1. Environmental Limitations: Proceed with installation only when existing and forecasted weather conditions permit product installation and related Work to be performed in accordance with manufacturer's written instructions and warranty requirements.

Retain subparagraph below for self-adhering, polymer-modified bitumen sheet used as water protection and an ice barrier.

Install self-adhering, polymer-modified bitumen sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

* + - * 1. Moisture Protection:

Cover, seal or otherwise protect the roof and flashings so that water cannot accumulate or flow under completed portions. When and where necessary to accomplish this, provide temporary water cut-offs.

Use subparagraph below on rehab. Work only.

Limit the removal of existing materials to areas that can be completely re-roofed or temporarily protected within the same day.

* + - 1. WARRANTY

When warranties are required, verify with Director’s Representative that warranties stated in this article are not less than remedies available to Owner under prevailing local laws.

* + - * 1. Materials Warranty: Manufacturer's warranty administered by CSSB and on CSSB's standard form in which manufacturer agrees to repair or replace CSSB-labeled products that fail in materials within specified warranty period. Material failures include manufacturing defects that result in leaks.

Materials Warranty Period: Limited lifetime from date of Substantial Completion.

Retain "Roofing Installer's Warranty" paragraph below, with "Roofing Installer's Warranty" Article, if required.

* + - * 1. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace installed products that fail in materials or workmanship within specified warranty period.

Warranty Period: **[Two] [Five] <Insert number>** years from date of Substantial Completion.

* + - * 1. Special Warranty: The one year period required by Paragraph 9.8 of the General Conditions is extended to 2 years for the Work of this Section. Refer to Supplementary Conditions.
1. PRODUCTS
	* + 1. SOURCE LIMITATIONS
				1. Obtain each type of product from single source from single manufacturer.
			2. PERFORMANCE REQUIREMENTS
				1. Exterior Fire-Test Exposure: Provide roofing materials identical to those of assemblies tested for fire resistance in accordance with ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

Wood Products: Class C.

Fire-Retardant Treatment: Exterior-type pressure treatment complying with AWPA U1 and AWPA T1.

Accelerated Weathering: Subject test specimens to ASTM D2898 Method A before testing.

Identification: Attach a label to each bundle of wood products; include identification mark of testing agency acceptable to authorities having jurisdiction and identify manufacturer, chemical treatment, method of application, purpose of treatment, and warranties available.

* + - * 1. Grading Rules: Provide wood products that comply with CSSB grading rules for products indicated.

Identification: Attach a label to each bundle of wood products that identifies manufacturer, type of product, grade, dimensions, and identification mark of grading agency acceptable to authorities having jurisdiction.

* + - 1. WOOD ROOF SHINGLES

"Cedar Shingles" paragraph below corresponds to CSSB's Certigrade shingles.

* + - * 1. Cedar Shingles: Smooth-sawn western red cedar shingles.

Grade: No. 1, Blue Label, with starter courses of No. 1.

Coordinate option retained in "Size" subparagraph below with weather exposure retained in Part 3. Shingle thickness is customarily described by the overall thickness of a stack of shingles measured at the butt ends, which varies with shingle length. First option corresponds to five shingle butts measuring 2 inches; second option corresponds to five shingle butts measuring 2-1/4 inches; and third option corresponds to four shingle butts measuring 2 inches.

Size: **[16 inches long; 0.40 inch thick] [18 inches long; 0.45 inch thick] [24 inches long; 0.50 inch thick]** at butt.

Manufactured units in "Cedar Shingle Ridge Units" paragraph below correspond to CSSB's Certi-Ridge products.

* + - * 1. Cedar Shingle Ridge Units: Manufactured, smooth-sawn western red cedar caps for ridges and hips of same thickness as shingles, 7 inches wide; beveled, alternately overlapped, and nailed.

Grade: No. 1.

Coordinate option retained in "Length" subparagraph below with weather exposure retained in Part 3.

Length: **[16 inches] [18 inches]**.

"Rebutted and Rejointed Cedar Shingles" are for side wall use only. paragraph below corresponds to CSSB's Certigrade (R&R) shingles.

* + - * 1. Rebutted and Rejointed Shingles: Red cedar shingles, trimmed for parallel edges with butts sawn at right angles.

Grade: No. 1, Blue label.

Coordinate option retained in "Size" subparagraph below.

Size: **[16 inches long; 0.50 inch thick] [18 inches long; 0.50 inch thick] [24 inches long; 0.50 inch thick]** at butt.

* + - 1. WOOD ROOF SHAKES
				1. Split Cedar Shakes: Hand-split and resawn western red cedar shakes; rough split face and sawn back.

Grade:

Roof: No. 1.

Starter Courses: No. 1.

Coordinate option retained in "Length" subparagraph below with weather exposure retained in Part 3.

Length: **[16 inches] [18 inches] [24 inches]**, with 15-inch-long starter course.

Thickness: 1/2 inch at butt.

* + - * 1. Cedar Shake Ridge Units: Manufactured, western red cedar caps for ridges and hips of same type and grade as exposed roof shakes, 9 inches wide; beveled, alternately overlapped, and nailed.

Coordinate option retained in "Length" subparagraph below with type of shakes required and weather exposure retained in Part 3. Manufactured split units are only available in 24-inch length.

Length: **[16 inches] [18 inches] [24 inches]**.

Thickness: 1/2 inch at butt.

* + - 1. UNDERLAYMENT MATERIALS
				1. Retain Type I, for typical applications. Retain Type II for instances requiring a heavier felt
				2. Felt: Asphalt-saturated organic felts, nonperforated and complying with the following:

ASTM D226: Type I **[Type II]**.

Use paragraph below beneath all flashings and at eaves on heated buildings.

* + - * 1. Self-Adhering, Polymer-Modified Bitumen Sheet: ASTM D1970, minimum 40-mil- thick sheet; glass-fiber-mat-reinforced, polymer-modified asphalt; with slip-resistant top surface and release backing; cold applied. Provide primer for adjoining concrete, masonry, and metal surfaces to receive underlayment.

Basis-of-Design Product: Subject to compliance with requirements.

GCP Applied Technologies Inc.; Grace Ice & Water Shield.

Approved equivalent.

* + - 1. ACCESSORIES
				1. Asphalt Roofing Cement: ASTM D4586, Type II, asbestos free.
				2. Elastomeric Flashing Sealant: ASTM C920, Type S, Grade NS, one-part, non-sag, elastomeric polymer sealant; of class and use classifications required to seal joints and remain watertight; recommended in writing by manufacturer for installation of flashing systems.

Retain "Drainage Mat" paragraph below if a venting, moisture-relief drainage mat is required under wood roof shingles and shakes installed directly on solid-board or solid-panel sheathing.

* + - * 1. Drainage Mat: Manufacturer's standard, compression-resisting, three-dimensional, nonwoven, entangled filament, nylon mat designed to permit air movement and to drain incidental moisture by gravity.
				2. Roofing Nails: ASTM F1667, hot-dip galvanized-steel box-type wire nails, sharp pointed, and of sufficient length to penetrate a minimum of 3/4 inch into sheathing or to penetrate through roof sheathing less than 3/4 inch thick.

Retain subparagraph below if applicable; revise to suit Project.

Where nails are in contact with metal flashing, use nails made from same metal as flashing.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.

Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored and that provisions have been made for flashings and penetrations through wood roofing.

Verify that vent stacks and other penetrations through roofing are installed and securely fastened.

* + - * 1. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. INSTALLATION OF UNDERLAYMENT MATERIALS

Underlayments installed parallel to eaves are installed perpendicular to sloped roof deck. Underlayments installed parallel to the rake are installed parallel to sloped roof deck.

* + - * 1. Comply with underlayment manufacturer's written installation instructions and with recommendations in CSSB's "New Roof Construction Manual" and NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" applicable to products and applications indicated unless more stringent requirements are specified in the Section or indicated on Drawings.
				2. Felt: Install on roof deck parallel with and starting at eaves and fasten with underlayment nails.

Roofs with a slope of 4:12 or greater are usually installed with a single underlayment layer. Verify requirements of authorities having jurisdiction.

Single-Layer Installation:

Usually, retain first option in first subparagraph below for 2-inch- minimum side laps, except for where the limiting design wind speed is equal to or greater than 140 mph (63 m/s). In that case, the BCNYS and the RCNYS require at least 4-inch side laps. Verify requirements of authorities having jurisdiction.

Lap sides a minimum of **[2 inches] [4 inches]** over underlying course.

Lap ends a minimum of 4 inches.

Stagger end laps between succeeding courses at least 72 inches.

Install felt underlayment on roof deck not covered by self-adhering, polymer-modified bitumen sheet.

Lap ends of felt not less than 6 inches over self-adhering sheet.

Retain first option in subparagraph below if desired for areas where roof deck is covered by self-adhering, polymer-modified bitumen sheet against walls and other roof projections.

Terminate felt **[flush] [extended up not less than 4 inches]** against sidewalls, curbs, chimneys, and other roof projections.

Retain "Self-Adhering, Polymer-Modified Bitumen Sheet" paragraph below if required for water and ice-dam protection.

* + - * 1. Self-Adhering, Polymer-Modified Bitumen Sheet: Install, wrinkle free, on roof deck.

Comply with low-temperature installation restrictions of underlayment manufacturer.

Install lapped in direction that sheds water.

Lap sides not less than 4 inches. Lap ends not less than 6 inches, staggered 24 inches between succeeding courses.

Roll laps with roller.

Retain first subparagraph below if primer is required to enhance adhesion to concrete and masonry surfaces, such as chimneys or walls, and metal surfaces, such as valley flashing.

Prime concrete, masonry, and metal surfaces to receive self-adhering sheet.

Retain one or more of first eight subparagraphs below if locations are not indicated on Drawings. Revise to suit Project.

Eaves: Extend from edges of eaves 24 inches beyond interior face of exterior wall.

Rakes: Extend from edges of rakes 24 inches beyond interior face of exterior wall.

Verify requirements of authorities having jurisdiction for valley underlayment.

Valleys: Extend from lowest to highest point 18 inches on each side of centerline.

Hips: Extend 18 inches on each side.

Ridges: Extend 18 inches on each side without obstructing continuous ridge vent slot.

Sidewalls: Extend 18 inches beyond sidewalls and return vertically against sidewalls not less than 6 inches.

Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Extend 18 inches beyond penetrating elements and return vertically against penetrating elements not less than 6 inches.

Roof-Slope Transitions: Extend 18 inches on each roof slope.

Cover underlayment within seven days.

* + - 1. INSTALLATION OF WOOD ROOF SHINGLES
				1. Install wood roof shingles in accordance with manufacturer's written instructions and recommendations in CSSB's "New Roof Construction Manual" and NRCA's "The NRCA Roofing Manual: Steep-Slope Roofing Systems."

Retain first paragraph below if a venting, moisture-relief drainage mat is required over solid-sheathed roof deck.

* + - * 1. Install drainage mat perpendicular to roof slope in parallel courses, butting edges and ends to form a continuous layer, and fasten to roof deck.
				2. Install wood-shingle starter course along lowest roof edge.

Install in double layer with joints offset a minimum of 1-1/2 inches.

Extend 1 inch over fascia.

Extend 1 inch over rake edge.

Revise first paragraph below for random courses or ribbon courses rather than continuous straight-line courses.

* + - * 1. Install first course of wood roof shingles directly over starter course and in continuous straight-line courses across roof deck. Install second and succeeding courses of wood roof shingles in continuous straight-line courses across roof deck.

Extend 1 inch over rake edge.

Offset joints between shingles in succeeding courses a minimum of 1-1/2 inches. Do not align vertical joints in alternate courses.

Space shingles a minimum of 1/4 inch and a maximum of 3/8 inch apart.

Fasten each shingle with two nails spaced 3/4 to 1 inch from edge of shingle and 1-1/2 to 2 inches above butt line of succeeding course. Drive fasteners flush with top surface of shingles without crushing wood.

Retain one of three options in subparagraph below. Examples are maximum exposures recommended by CSSB and NRCA for No. 1 grade shingles on roof slopes 4:12 and steeper. Decrease exposure dimension for lower roof slope.

Maintain weather exposure of **[5 inches for 16-inch-] [5-1/2 inches for 18-inch-] [7-1/2 inches for 24-inch-]** long shingles.

Retain "Open Valleys" paragraph below if required. CSSB recognizes open valleys only; NRCA recognizes open, closed (mitered), and closed fanned (swept) valleys. Revise paragraph if specifying another type of valley that is lined with sheet metal valley flashing.

* + - * 1. Open Valleys: Cut and fit wood roof shingles at open valleys, trimming upper concealed corners of shingles. Widen exposed portion of open valley 1/8 inch in 12 inches from highest to lowest point.

Do not break joints into the valleys or lay shingles with the grain parallel with the center line of valley.

Retain "Ridge Vents" paragraph below for ridge vents.

* + - * 1. Ridge Vents: Install continuous ridge vents over wood roof shingles in accordance with manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate roof sheathing.
				2. Ridge Units: Install units over wood roof shingles trimmed at apex of ridges and hips.

Maintain same exposure dimension of units as roof-shingle exposure.

Lap units at ridges to shed water away from direction of prevailing winds.

Alternate overlaps of units and fasten with concealed roofing nails of sufficient length to penetrate sheathing.

CSSB and NRCA suggest installing a felt or self-adhering, polymer-modified bitumen underlayment strip under ridge and hip caps for added weather protection.

At unventilated ridges and hips, install concealed strip of **[felt] [self-adhering, polymer-modified bitumen sheet]** underlayment over apex shingles and below ridge units.

Retain subparagraph below if ridge vents are required.

Fasten ridge units to cover ridge vent without obstructing airflow.

* + - 1. INSTALLATION OF WOOD ROOF SHAKES
				1. Install wood roof shakes in accordance with manufacturer's written instructions and recommendations in CSSB's "New Roof Construction Manual" and NRCA's "The NRCA Roofing Manual: Steep-Slope Roofing Systems."

Retain first paragraph below if a venting, moisture-relief drainage mat is required over solid-sheathed roof deck.

* + - * 1. Install drainage mat perpendicular to roof slope in parallel courses, butting edges and ends to form a continuous layer, and fasten to roof deck.
				2. Install wood-shake starter course along lowest roof edge.

Install in double layer with joints offset a minimum of 1-1/2 inches.

Extend 1 inch over fascia.

Extend 1 inch over rake edge.

Revise first paragraph below for random courses or ribbon courses rather than continuous straight-line courses.

* + - * 1. Install first course of wood roof shakes directly over starter course and in continuous straight-line courses across roof deck. Install second and succeeding courses of wood roof shakes in continuous straight-line courses across roof deck.

Extend 1 inch over rake edge.

Felt interlayment is used with roof shakes to intercept and shed rain and snow driven up under the shakes.

Interlay 18-inch-wide strip of felt over top portion of first and each succeeding course. Set bottom edge of felt interlayment at a distance of twice the weather-exposure dimension above the shake butt. Stagger fasten to roof deck with felt-underlayment nails.

Offset joints between shakes in succeeding courses a minimum of 1-1/2 inches.

Space shakes a minimum of 3/8 inch and a maximum of 5/8 inch apart.

Fasten each shake with two nails spaced 3/4 to 1 inch from edge of shake and 1-1/2 to 2 inches above butt line of succeeding course. Drive fasteners flush with top surface of shakes without crushing wood.

Retain one of four options in subparagraph below. Examples are different exposures noted by CSSB and NRCA for shakes on roof slopes 4:12 and steeper. The lesser of the two exposures for each shake length below results in a roof that is three layers thick.

Maintain weather exposure of **[7-1/2 inches for 18-inch-] [10 inches for 24-inch-]** long shakes.

Retain "Open Valleys" paragraph below if required. CSSB recognizes open valleys only; NRCA recognizes open, closed (mitered), and closed fanned (swept) valleys. Revise paragraph if specifying another type of valley that is lined with sheet metal valley flashing.

* + - * 1. Open Valleys: Cut and fit wood roof shakes at open valleys, trimming upper concealed corners of shakes. Widen exposed portion of open valley 1/8 inch in 12 inches from highest to lowest point.

Do not break joints into the valley, or lay shakes with the grain parallel with the center line of valley.

Retain "Ridge Vents" paragraph below for ridge vents.

* + - * 1. Ridge Vents: Install continuous ridge vents over wood roof shakes in accordance with manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
				2. Ridge Units: Install units over wood roof shakes trimmed at apex of ridges and hips.

Maintain same exposure dimension of units as roof-shake exposure.

Lap units at ridges to shed water away from direction of prevailing winds.

Alternate overlaps of units and fasten with concealed roofing nails of sufficient length to penetrate sheathing.

CSSB and NRCA suggest installing a felt or self-adhering sheet underlayment strip under ridge and hip caps for added weather protection.

At unventilated ridges and hips, install concealed strip of **[felt] [self-adhering, polymer-modified bitumen sheet]** underlayment over apex shingles and below ridge units.

Retain subparagraph below if ridge vents are required.

Fasten ridge units to cover ridge vent without obstructing airflow.

Use article below for wall installation of shingles.

* + - 1. WALL INSTALLATION
				1. Installing Shingles:

Install one ply of felt underlayment over the entire surface to be shingled. Lay edges a minimum of 2 inches and ends a minimum of 6 inches.

Start shingles with a starter course so that the first course at the bottom of the wall is doubled.

Butt shingles together so joints are closed.

Stagger joints in courses so that no joints in any three adjacent courses are in alignment.

Maintain weather exposure of **[7-1/2 inches for 16-inch-] [8-1/2 inches for 18-inch-] [11-1/2 inches for 24-inch-]** long shingles.

Inside and Outside Corners:

Miter cut the shingles so they can be installed with an alternate overlap between courses.

Nailing Shingles:

Secure each shingle with two nails. Place each nail not more than 3/4 inch from the side of the shingle and not more than 2 inches above the butt line of the next course.

Drive nails flush without driving the nailheads into the shingles or crushing the wood.

* + - 1. CLEANING
				1. Clean debris from roofs, gutters, downspouts, and drainage systems. Test drainage system for proper operation.

END OF SECTION 073129