



SECTION 07310

SHINGLES

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. **Multi-Width** Synthetic shake shingles, underlayment, flashings, fasteners, and accessories

1.2 RELATED SECTIONS

- A. Section 06100 - Rough Carpentry
- B. Section 07600 - Flashing and Sheet Metal
- C. Section 07600 - Flashing and Sheet Metal
- D. Section 07910 - Joint Fillers

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM D 226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
 - 2. ASTM E 108 (UL 790) - Standard Test Methods for Fire Tests of Roof Coverings
- B. Underwriters Laboratories (UL)
 - 1. ASTM E 108 (UL 790) - Standard Test Methods for Fire Tests of Roof Coverings
- C. International Code Council (ICC): ES Acceptance Criteria AC07 Section 4.9

1.4 PERFORMANCE REQUIREMENTS

- A. Shake roof system to consist of manufactured synthetic shakes attached to structural substrate to form weather tight roof envelope with no measurable water penetration
- B. Shakes shall be manufactured with variations in size, textured faces and edges, and no less than 3/4" thickness to provide a realistic installed appearance
- C. Shakes shall be manufactured with no variation in color
- D. Method of attachments shall be designed to adequately resist wind uplift for roof configuration and project location

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300 - Administrative Requirements
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Shingles, underlayment, flashings, fasteners, and accessories indicating composition, properties, and dimensions. Provide data showing compliance with specified requirements
 - 2. Preparation instructions and recommendations
 - 3. Storage and handling requirements and recommendations
 - 4. Installation methods
- C. Shop Drawings: Drawings illustrating shingle layout, method of attachment, flashings, trim, conditions at eaves, intersections with adjacent materials, and other installation details



- D. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and surface textures
- E. Verification Samples: For each finish product specified, two samples, representing actual product, color, and texture

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturer of synthetic shingles
- B. Installer Qualifications: Company specializing in installing shingle roof systems with 5 years minimum experience
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship
 - 1. Finish areas designated by Architect
 - 2. Do not proceed with remaining work until workmanship, color, and pattern are approved by Architect
 - 3. Rework mock-up area as required to produce acceptable work

1.7 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-installation conference at the site prior to commencing work of this Section: Require attendance of entities directly concerned with roof installation. Agenda shall include:
 - 1. Installation procedures and manufacturer's recommendations
 - 2. Safety procedures
 - 3. Coordination with installation of other work
 - 4. Availability of roofing materials
 - 5. Preparation and approval of substrate and penetrations through roof
 - 6. Other items related to successful execution of work

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Ship in bundles of shingles. Bundles shall be assembled such that sorting at job site is not required
- B. Deliver shingles to site in manufacturer's unopened, labeled bundles. Promptly verify quantities and condition. Immediately remove damaged products from site
- C. Store products in protected environment, clear of ground, moisture, UV, and protected from traffic and construction activities. Store shingles on edge no more than 2 pallets high, do not store flat. Do not store on site for prolonged period unless weather and UV protected
- D. Store synthetic shake products at temperature between 40- and 120-degrees F (4 degrees C and 49 degrees C)
- E. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction

1.9 PROJECT CONDITIONS

- A. Anticipate and observe environmental conditions (temperature, humidity, and moisture) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits



1.10 WARRANTY

A. Warranty Requirements:

1. Manufacturer's 50 years warranty for manufacturing defects that results in leaks under normal weather and use conditions
2. Installer's 2 years total roof system warranty including underlayment, flashings, trim, and other roof components against water penetration

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: CeDUR manufactured by Colorado Roofing Products, LLC, which is located at: 3590 Himalaya Road, Aurora, CO 80011; Toll Free Tel: (844) 974-9196; Tel: (720) 974-9200; Fax: (720) 974-3193; Email: Info@CeDUR.com, Web: www.cedur.com

B. Substitutions: Not permitted

2.2 SYNTHETIC SHAKE SHINGLES

A. Lightweight, synthetic shakes with the appearance, color, texture, and thickness of natural wood shakes

1. Product: Multi-Width Shake as manufactured by CeDUR
2. Material: Engineered polymer formulated from 100 percent virgin polyurethanes to ensure high quality and consistency of raw materials. Use of recycled materials is not acceptable
3. Attributes:
 - a. Fire resistance: Class A (without the use of Class A rated underlayment's) tested in accordance with ASTM E 108/UL 790
 - b. Impact resistance: Class 4 to withstand two drops of 2 inches (52 mm) diameter, 1.2 pounds (0.54 kg) steel ball dropped from 20 feet (6 m) tested in accordance with UL 2218
 - c. Freeze-thaw resistance: No crazing, cracking, or other deleterious surface changes after one-month exposure with temperature cycled from -40 to +180 degrees F (0 degrees to 82 degrees C) in 22 hours tested in accordance with International Code Council (ICC) – ES Acceptance Criteria AC07 Section 4.9
 - d. Accelerated weathering: Little change after 2,500 hours exposure to ultraviolet (UV) radiation, elevated temperature, moisture, and thermal shock tested in accordance with International Code Council (ICC) – ES Acceptance Criteria AC07 Section 4.9
 - e. Installed weight:
 1. At 9 inches (229 mm) exposure: 188 pounds per square (9.18 kg/sq. m)
 2. At 10 inches (254 mm) exposure: 170 pounds per square (8.3 kg/sq. m)
4. Profile: Solid polyurethane product manufactured in a rectangular shape with exposed to view upper surface and edges textured to resemble natural wood shake
5. Size: Shake
 - a. Thickness: Varies from 1/8 inch (3 mm) at top to 3/4 inch (19 mm) at bottom
 - b. Length: 23.75 inches (603 mm)
 - c. Variable widths: 5, 7, and 12 inches (127, 178, and 305 mm) to create appearance of random sized natural wood shake
6. Starter Shingle: Provide 15 inches (381 mm) long by 15 inches (381 mm) wide
7. Markings: Form shingles with markings on upper surface to indicate nailing locations along with manufacturers quality markings
8. Color: Provide shingles in single color comparable to natural wood shakes, no color stabilizers allowed providing a natural aging process



9. Shake Pattern: Provide shakes factory blended single color and widths to create installed appearance designated as follows
 - a. Golden Cedar by CeDUR
 - b. Live Oak by CeDUR
 - c. Shiloh by CeDUR
 - d. Walden by CeDUR

2.3 ACCESSORIES

- A. Underlayment: Architecturally specified underlayment that meets ASTM D226 requirement.
- B. Waterproof Sheet Membrane: Cold applied, self-adhering waterproof membrane composed of polyethylene film coated one side with rubberized asphalt adhesive
 1. Thickness: 40 mils (1 mm)
 2. Low temperature flexibility: Unaffected at minus 32 degrees F (-36 degrees C)
 3. Minimum tensile strength: 250 psi (1724 kPa)
 4. Minimum elongation: 250 percent
 5. Permeance: 0.05 perms maximum
- C. Flashing: Fabricate from sheet to profiles and dimensions indicated on Drawings and approved shop drawings and in accordance with general requirements specified in Section 07 60 00 – Flashing and Sheet Metal
 1. Material: 16-ounce copper
 2. Material: No less than 26 gauge (0.455 mm) galvanized steel
 3. Linear components: Form in longest possible lengths with 8 feet (2.5 m) as minimum
 4. Counter Flashings: Extend 5 inches (127 mm) minimum up vertical surfaces and 5 inches (127 mm) minimum under shingles
 5. Valley flashings: 24 inches minimum width and extending 11 inches (279 mm) minimum from valley center line
 6. Fabricate eave flashings with bottom edge formed outward ¼ inch (6 mm) and hemmed to form drip
- D. Fasteners: 3/8-inch (9.5 mm) ring shank flat head nails 1-3/4 inches (44 mm) long
 1. Material: Copper
 2. Material: Stainless steel
 3. Material: Hot-dipped galvanized

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding

3.2 PREPERATION

- A. Coordinate installation with provision of gutters and downspouts specified in Section 07 60 00 - Flashing and Sheet Metal
- B. Inspect roof framing and plywood or OSB substrate. Verify roof is complete, rigid, braced, and deck members are securely fastened. Ensure proper ventilation has been provided for roof space. Do not proceed with roofing until deficiencies are addressed
- C. Verify roof deck is clean, dry, and ready to receive synthetic shake shingles



- D. Remove dirt, loose fasteners, and other protrusions from roof surface

3.3 INSTALLATION GENERAL

- A. Install self-adhered waterproof sheet membrane on the eaves. Cover the waterproof sheet membrane and the remaining portions of the roof as scheduled with the approved underlayment(s). Then install waterproof sheet membrane in valleys, along walls and around projections terminating on top of underlayment

3.4 UNDERLAYMENT INSTALLATION

- A. Stripping Ply: A full sheet of self-adhered waterproof sheet membrane is required in all valleys. At least 18 inches (457 mm) shall be required on all gable ends, against walls, and around projections
 - 1. In areas where the average daily temperature in January is 25 degrees F (-4 degrees C) or lower or where ice buildup is possible, install self-adhered waterproof sheet membrane from the bottom edge extending two feet (610 mm) above the exterior wall line on all eaves
- B. Install waterproof sheet membrane over full roof area. Apply waterproof sheet membrane in fair weather at temperatures of 40 degrees F (4 degrees C) or higher. Adhere and attach as recommended by manufacturer of waterproof sheet membrane
 - 1. Start underlayment installation at lower edge of roof. Install perpendicular to roof slope with 4 inches (102 mm) minimum side laps and 6 inches (152 mm) minimum end laps. Extend underlayment 4 inches (102 mm) minimum up vertical wall intersections
 - 2. Do not leave underlayment membrane exposed for lengthy period of time. Exercise care not to puncture or tear underlayment barrier with subsequent roofing operations
- C. Underlayment/Slip Sheet: Install one-ply asphalt felt over full roof area, with ends weather lapped 4 inches (102 mm) minimum. Nail in place with roofing nails spaced in accordance with manufacturer's recommendations

3.5 INTERLAYMENT

- A. For pitches 4:12 and 5:12 install a minimum 18" wide strip of interlay of ASTM D 226 type II (ASTM D 4869) No. 30 shall be laid over the top portion of the starter shakes, the butt end of the interlay course extending up-slope onto the sheathing and/or dry-in, approximately 9 inches above the fascia (For a 1 inch overhang). After installing the field shakes over the starter shakes, position the bottom edge of the next interlay on the 10-inch line of the interlay previously installed, with successive courses laid on the 10-inch line (or less depending on roof layouts less than 10")
- B. Felt interlayment on the CeDUR Shakes is to be installed so it does not extend below a line that is twice the exposure above the butt (i.e. 23.5" shakes at 10", exposure would have felt applied 20" above the butt). No felt should be visible between the side joints of the shakes (keyway). Refer to the CeDUR Shakes Technical Specification Details

3.6 FLASHING INSTALLATION

- A. Install overhanging drip edge on eaves and gable ends and metal flashings at valleys, ridges, hips, roof curbs, penetrations, and intersections with vertical surfaces in accordance with Section 07 60 00 - Flashing and Sheet Metal
- B. Weather lap joints 2 inches (52 mm) minimum and seal with sealant as specified in Section 07 91 26 - Joint Fillers
- C. Secure in place with clips, nails, or other fasteners



3.7 INSTALLATION – GENERAL

- A. Install synthetic shakes in accordance with manufacturer's instructions and approved shop drawings
- B. Accurately layout shingles. Ensure that edges are parallel and perpendicular to roof eaves
- C. Cutting: Layout work to avoid cutting shingles. 1. At gables and vertical intersections, vary combination of shingle widths and spacing of shingles to avoid cutting
 - 1. At gables and vertical intersections, vary combination of shingle widths and spacing of shingles to avoid cutting
 - 2. If cutting is required, place shingle such that cut edge is not exposed
 - 3. Use circular saw or straight edge and utility knife if cuts are necessary

3.8 SHAKE SHINGLE INSTALLATION

- A. Install shingles in a rack or pyramid style from factory assembled bundles
- B. Exposure: Install shingles in staggered pattern with 9 inches (229 mm) exposure and bottom edges of adjacent shingles staggered 1 inch (25 mm)
- C. Exposure: Install shingles in staggered pattern with 9 inches (229 mm) exposure and bottom edges of adjacent shingles staggered 1 inch (25 mm)
- D. Spacing: Provide 1/4 - 3/8-inch (6.35 - 9.52 mm) gap between shingles to allow for expansion and contraction
- E. Stagger shingle joints in one course 1-1/2 inches (38 mm) minimum from joints in course below
- F. Eaves: Install row of starter shingles at eaves as base layer. Project eave shingles approximately 1 inch (25 mm), 1/8 inch (3 mm) past overhanging drip edge, or as required to allow water to drain into gutter or off eave as indicated or required
- G. Gables: Project shingles approximately 3/4 inch beyond gable rakes or 1/8 inch (3 mm) past overhanging drip edge
- H. Ridges and Hips: After field shingle installation is complete, install preformed 5-inch CeDUR Hip/Ridge
 - 1. Ridges: Use 5" (127 mm) CeDUR preformed Hip/Ridge shakes with 10" (254 mm) exposure. Start ridge shingles at leeward end. Face shingle laps away from prevailing wind
 - 2. Hips: Use 5" (127 mm) CeDUR preformed Hip/Ridge shakes with 10" (254 mm) exposure. Start hip course at eave
- I. Fastening: Attach each shingle to wood deck with 2 or 3 nails depending on shake size using hammer or pneumatic nail gun.
 - 1. Place nails at locations indicated on shingles
 - 2. Ensure good penetration but do not overdrive nail. Do not nail at angle. Ensure head is flush with shingle surface to avoid creating craters
 - 3. At valleys do not nail shingles within 5 inches (127 mm) of valley center line
- J. Snow Guards: Install snow guards in areas where snow fall is possible

3.9 FIELD QUALITY CONTROL

- A. Inspect units as they are installed. Do not install cracked, broken, twisted, curled, or otherwise damaged units
- B. As work progresses, exercise care not to scratch or mar installed units. Units damaged during installation shall be immediately removed and discarded



- C. After approximately 200 units have been installed, inspect roof from ground. Verify proper layout and appearance. Repeat inspection every 200 shingles
- D. Visually inspect complete installation to ensure that it is weather tight

3.10 CLEANING AND PROTECTION

- A. Remove excess materials and debris from finished surfaces and adjacent roof areas
- B. Do not allow work force on completed roof
- C. Protect installed products until completion of project
- D. Touch-up, repair or replace damaged products before Substantial Completion

END OF SECTION