SECTION 073126 - SLATE SHINGLES

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. 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:

Slate shingles.

Underlayment materials.

Ridge accessories.

Metal flashing and trim.

Refer to sections listed below for cross-reference requirements Contractor might expect to find in this Section but are specified in other Sections. Sections listed below are for spec editor’s and design team coordination and are to remain as Editor’s Notes. Remove referenced specification sections within the body of the specification if not applicable to the project.

Section 077253 "Snow Guards" for snow guards.

* + - 1. DEFINITIONS
				1. Roofing Terminology: See ASTM D1079 for definitions of terms related to roofing Work in this Section.
			2. 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.

<**Insert participant requirements**>.

* + - 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 the following:

Slate shingles.

Underlayment materials.

Ridge accessories.

Asphalt roofing cement.

Butyl sealant.

Elastomeric sealant.

Roofing asphalt.

Cold-applied adhesive.

Manufacturer’s installation instructions for complete Shingle assembly specified.

* + - * 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.

Retain "Samples" paragraph below for single-stage Samples. 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, in sizes indicated.

Slate Shingles: Full size, of each color, size, texture, and shape.

Metal Ridge Cap: 12-inch long Sample.

Rigid-Plastic Ridge Vent: 12-inch long Sample.

Retain "Metal Valley Flashing" subparagraph below if open valleys are required.

Metal Valley Flashing: 12 inches square.

* + - * 1. Samples for Initial Selection:

For each type of slate shingle.

For each type of accessory involving color selection.

* + - * 1. Samples for Verification: For the following products, in sizes indicated:

Slate Shingle: Full size, of each color, size, texture, and shape.

Metal Ridge Cap: 12-inch long Sample.

Rigid-Plastic Ridge Vent: 12-inch long Sample.

Retain "Metal Valley Flashing" subparagraph below if open valleys are required.

Metal Valley Flashing: 12 inches square.

* + - * 1. Quality Control Submittals:

Retain "Material Test Reports" paragraph below for material test reports that are Contractor's responsibility.

Material Test Reports: For each slate variety, by a qualified testing agency.

Retain "Research Reports" paragraph below for polymer-modified bitumen sheet and synthetic underlayment if required.

Research Reports: From [**an agency acceptable to authorities having jurisdiction**] [**UNIFORM CODE-ES**] <**Insert evaluation agency**>, indicating that product is suitable for intended use under applicable building codes for the following:

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 applicable subparagraphs below to suit Project. The BCNYS and the RCNYS do not address polymer-modified bitumen sheet and synthetic underlayments.

Polymer-modified bitumen sheet underlayment.

Synthetic underlayment.

* + - * 1. 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.

Revise "Slate Shingles" subparagraph below if different quantities of different types of shingles are required; for example, special shapes or colors.

Slate Shingles: [**100 sq. ft.] <Insert area**> of each size, type, and color, in unbroken bundles.

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

Build Benchmarks for slate shingles including related roofing materials.

Size: [**48 inches** **long by** **48 inches** **wide**] <**Insert dimensions**>.

Retain first subparagraph below if required; insert other Benchmark requirements to suit Project.

Include gutter and downspout complying with requirements in [**Section 076200 "Sheet Metal Flashing and Trim."] [Section 077100 "Roof Specialties."]**

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

Retain subparagraph below if the intention is to make an exception to the default requirement for demolishing and removing Benchmarks.

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

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Store underlayment rolls in a dry, well-ventilated location protected from weather, sunlight, and moisture in accordance with manufacturer's written instructions.

Store on end, on pallets or other raised surfaces.

Do not double-stack rolls.

* + - * 1. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
				2. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.
			1. 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, an ice barrier, or underlayment.

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

* + - 1. WARRANTY

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

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 components of slate-shingle roofing 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

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. For definitions of terms and requirements for Contractor's product selection.

* + - 1. SOURCE LIMITATIONS
				1. Obtain each type of product from single source from single manufacturer.
			2. PERFORMANCE REQUIREMENTS

Retain this article for classified roof assemblies. If retaining, revise "Exterior Fire-Test Exposure" paragraph below to suit Project. Slate shingles are exempt from testing for Class A fire resistance if installed on noncombustible roof decks under the BCNYS and the RCNYS. Using ASTM D226 Type II underlayment over combustible decks also satisfies the BCNYS and the RCNYS requirements for Class A roof assemblies. See "Fire Resistance" Article in the Evaluations and verify requirements of authorities having jurisdiction for roof assembly.

* + - * 1. Exterior Fire-Test Exposure: Provide slate shingles and related roofing materials identical to those of assemblies tested for Class A 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.
			1. SLATE SHINGLES

For roofing longevity, NRCA recommends Grade S1, the highest grade for slate shingles, instead of Grade S2. See "Slate Product Standard" Article in the Evaluations.

* + - * 1. Slate Shingles: ASTM C406, [**Grade S1**] [**Grade S2**]; hard, dense, and sound; with chamfered edges and nail holes machine punched or drilled and countersunk; with no broken or cracked slates, no broken exposed corners, and no broken corners on covered ends that could sacrifice nailing strength or laying of a watertight roof.

Standard slate roofs use smooth-textured slate shingles that are nominal 1/4 inch thick.

For graduated slate roofing, revise "Thickness and Surface Texture," "Length," and "Width" subparagraphs below to include range of thicknesses and sizes; use the thickest, widest, and longest shingles at the eaves and progressively reduce these dimensions toward the ridge.

Thickness and Surface Texture: Nominal [**1/4 inch**, smooth] [**1/4 to 3/8 inch**, rough] [**3/8 to 1/2 inch**, rough] <Insert dimension and surface texture>.

Typical shingle lengths are 12, 14, 16, 18, 20, 22, and 24 inches, although shorter lengths are available. Commonly produced lengths include 16, 18, and 20 inches.

Length: [**16 inches**] [**18 inches**] [**20 inches**] <Insert dimension>.

The narrowest width for a shingle length equals one-half of the length. The widest shingle width is typically 14 inches, although widths of 16 inches are available. Traditionally, 13-inch widths are unavailable. For 16-inch-long shingles, common uniform widths are 8, 10, and 12 inches. For 18- and 20-inch-long shingles, common uniform widths are 10 and 12 inches.

Width: [14 inches**] [**12 inches**] [**11 inches**] [**10 inches**] [**9 inches**] [**8 inches**] [random widths, but not less than one-half-length] <Insert dimension**>.

Two prepunched holes per shingle are standard for slate shingles. For roofs subject to high winds and for 3/4-inch-thick or thicker slate shingles, four holes may be required.

Nail Holes: [**Two] [Four**] per shingle.

Specify uniform width, rather than random widths, with special butt shapes (shapes other than standard square cut). Descriptions of special butt shapes may vary regionally. Indicate shape on Drawings if descriptions are insufficient.

Butt Shape: [**Standard square cut] [Pointed] [Deep bevel] [Shallow bevel] [Deep scallop] [Shallow scallop] [Round] <Insert shape**>.

Retain color option in "Color" subparagraph below after verifying availability. Colors available in one region may not be available in another.

Color: [**Black] [Gray] [Purple] [Green] [Blue-black] [Blue-gray] [Mottled purple and green] [Red] [Match Director’s Representative’s samples] [As selected by Director’s Representative from manufacturer's full range] <Insert color**>.

Retain "Unfading" option in "Weather-Exposure Color Change" subparagraph below for minimal color change; retain "Weathering" option for moderate or obvious color change. Because color change is an inherent slate property, verify availability with manufacturers.

Weather-Exposure Color Change: [**Unfading] [Weathering**].

* + - * 1. Starter Slate: Slate shingles with chamfered nail holes front-side punched.

Length: Exposure of slate shingle plus headlap.

Retain "Ridge Slate" paragraph below if ridge slate requires special fabrication during manufacture. Slate shingles for valleys, hips, finish course, and roof penetrations are field cut to shape and hole punched.

* + - * 1. Ridge Slate: Slate shingles fabricated with [**vertical**] [**horizontal**] grain orientation.
			1. UNDERLAYMENT MATERIALS

See "Underlayment," "Model-Code Underlayment Requirements," "NRCA Underlayment Recommendations," "Asphalt-Saturated Organic Felt Underlayment," "Synthetic Underlayment," "Polymer-Modified Bitumen Sheet Underlayment," and "Self-Adhering, Polymer-Modified Bitumen Sheet Underlayment" articles in the Evaluations for a discussion of various underlayment options.

Retain one of four options in "Asphalt-Saturated Organic Felt" paragraph below to suit Project. NRCA no longer recommends felt underlayment for use with slate shingles. ASTM D226 Type II and ASTM D4869 Type IV felt, both weighing 26 lb/100 sq. ft., are most commonly used. The IBC requires one layer of ASTM D226 Type II or ASTM D4869 Type III or IV felt where basic design wind speeds (three-second gusts per ASCE/SEI 7) are less than 140 mph. For greater basic design wind speeds, the IBC requires one layer of ASTM D226 Type II or ASTM D4869 Type IV felt. The IRC has less stringent requirements. See "Model-Code Underlayment Requirements" and "Asphalt-Saturated Organic Felt Underlayment" articles in the Evaluations.

* + - * 1. Asphalt-Saturated Organic Felt: [**ASTM D226 Type I**] [**ASTM D226 Type II**] [**ASTM D4869 Type III**] [**ASTM D4869 Type IV**] <**Insert requirements**>, unperforated.

If retaining "Synthetic Underlayment" paragraph below, verify that products comply with requirements of authorities having jurisdiction and are recommended for use under slate shingles. NRCA only recommends using synthetic underlayment as a top layer installed over an anchor layer of mechanically fastened or self-adhering, polymer-modified bitumen sheet. See "NRCA Underlayment Recommendations" Article in the Evaluations.

* + - * 1. Synthetic Underlayment: UV-resistant polypropylene, polyolefin, or polyethylene polymer fabric with surface coatings or treatments to improve traction underfoot and abrasion resistance; recommended, in writing, by manufacturer for use under slate shingles; and evaluated and documented to be suitable for use as a roof underlayment under applicable codes by a testing and inspecting agency acceptable to authorities having jurisdiction.

Retain "Polymer-Modified Bitumen Sheet" paragraph below for products marketed as underlayment or valley flashing. Revise to suit Project. NRCA recommends using polymer-modified bitumen sheet, including products used as base sheets in low-slope membrane roof systems and products marketed as underlayment, for slate-shingle underlayment. Sheets are mechanically fastened or, where used as an adhered top layer in a two-layer installation, set in a continuous layer of hot roofing asphalt or cold adhesive. See "NRCA Underlayment Recommendations" and "Polymer-Modified Bitumen Sheet Underlayment" articles in the Evaluations.

* + - * 1. Polymer-Modified Bitumen Sheet: Styrene-butadiene-styrene- (SBS) modified asphalt, glass-fiber-mat-reinforced sheet; minimum [**55-mil**] [**40-mil**] <**Insert dimension**> nominal thickness; recommended in writing by manufacturer and acceptable to authorities having jurisdiction for use as underlayment in slate steep-slope roofing systems; and designed for mechanical fastening or adhesive attachment using roofing asphalt or cold-applied adhesive.

If required, insert specific testing requirements for polymer-modified bitumen sheet products here. Product testing varies among manufacturers.

<Insert testing requirements>.

Retain "Self-Adhering, Polymer-Modified Bitumen Sheet" or "Self-Adhering, Polymer-Modified Bitumen Sheet, High Temperature" paragraph below to suit Project. Self-adhering, polymer-modified bitumen sheet commonly covers the entire roof deck for slate roofs and is also used for water and ice-dam protection in roof areas vulnerable to leakage. NRCA and the National Slate Association recommend covering self-adhering sheet with a top layer of a different type of underlayment. See "Self-Adhering, Polymer-Modified Bitumen Sheet Underlayment" Article in the Evaluations.

Retain one of first three options in "Self-Adhering, Polymer-Modified Bitumen Sheet" paragraph below to suit Project. ASTM D1970 requires a minimum thickness of 40 mils; however, product thicknesses vary.

* + - * 1. Self-Adhering, Polymer-Modified Bitumen Sheet: ASTM D1970, minimum [**55-mil**] [**50-mil**] [**40-mil**] <**Insert dimension**> 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.**]

Retain "Top Surface" subparagraph below if a specific surface is required. Polymer-film- and polyester-surfaced products cost more and might form better-quality laps than sand- and granule-surfaced products. Shingles will stick to sand- and granule-surfaced products, which makes roof repairs more difficult. To prevent this problem, cover self-adhering sheet with another type of underlayment. Installer preference based on experience and the slip-resistance characteristics of the various surface options might be a good reason to choose one type of surface over another.

Top Surface: [**Sand] [Granule] [Textured polymer film] [Polyester**].

* + - * 1. Self-Adhering, Polymer-Modified Bitumen Sheet, High Temperature: ASTM D1970, minimum [**55-mil**] [**50-mil**] [**40-mil**] <**Insert thickness**> 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.**]

Thermal Stability: Stable after testing at 240 deg F in accordance with ASTM D1970.

Retain "Top Surface" subparagraph below if a specific surface is required. Polymer-film- and polyester-surfaced products cost more and might form better-quality laps than granule-surfaced products. Shingles will stick to granule-surfaced products, which makes roof repairs more difficult. To prevent this problem, cover self-adhering sheet with another type of underlayment. Installer preference based on experience and the slip-resistance characteristics of the various surface options might be a good reason to choose one type of surface over another.

Top Surface: [**Granule] [Textured polymer film] [Polyester**].

* + - 1. RIDGE ACCESSORIES

"Metal Ridge Cap" paragraph below is an example of a proprietary slate-covered ridge cap that must be fastened into a wood ridge beam. The cap can be installed over a ventilating base.

* + - * 1. Metal Ridge Cap: Metal covers with noncorrosive components complete with internal anchoring lag screws, compression plates, and snap-on caps, fabricated for slate roof system indicated.

Type: [**Exposed-metal**] [**Slate-covered**] legs.

Retain "Venting" subparagraph below if required.

Venting:

Continuous, low-profile, compression-resistant ventilating base that provides a net free area of [**18 sq. in./ft.** ] <**Insert requirements**> of ridge.

[**With**] [**Without**] external baffles.

Metal Components: [**Copper, 20-oz./sq. ft. thick sheet] [Aluminum, 0.050-inch thick sheet, with manufacturer's standard two-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride (PVDF) resin by weight on exposed surfaces] <Insert requirements**>.

Accessories:

Splices, end caps, and other accessories of matching metal and finish.

If retaining "Rigid-Plastic Ridge Vent" paragraph below, verify that products can withstand the weight of slate over several decades.

* + - * 1. Rigid-Plastic Ridge Vent: Manufacturer's standard, rigid section high-density polypropylene or other UV-stabilized plastic ridge vent for use under slate ridge shingles.

Minimum Net Free Area: <**Insert area**>.

Width: <**Insert dimension**>.

Thickness: <**Insert dimension**>.

* + - 1. ACCESSORIES
				1. Asphalt Roofing Cement: ASTM D4586 Type II, asbestos free.
				2. Butyl Sealant: ASTM C1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied.

Revise "Elastomeric Sealant" paragraph below if a specific polymer, class, and use are required.

* + - * 1. Elastomeric Sealant: ASTM C920, Type S, Grade NS, one-part, non-sag, elastomeric polymer sealant; of class and use classifications required to seal joints in slate-shingle roofing and remain watertight; recommended in writing by manufacturer for applications indicated.

Retain "Roofing Asphalt" paragraph below if adhering top layer of polymer-modified bitumen sheet to the anchor layer of polymer-modified bitumen sheet with hot asphalt.

* + - * 1. Roofing Asphalt: ASTM D312 Type IV.

Retain "Cold-Applied Adhesive" paragraph below if adhering top layer of polymer-modified bitumen sheet to anchor layer of polymer-modified bitumen sheet with cold-applied adhesive.

* + - * 1. Cold-Applied Adhesive: Manufacturer's standard asphalt-based, one- or two-part, asbestos-free, cold-applied adhesive specially formulated for compatibility and use with underlayments.

Retain one of four options in "Slating Nails" paragraph below. NRCA recognizes the use of all options, but suggests using copper slating nails.

* + - * 1. Slating Nails: ASTM F1667, [**copper**] [**stainless steel**] [**silicon-bronze**] [**cut-brass**], smooth-shanked, wire nails; 0.135-inch minimum thickness; sharp pointed; with 3/8-inch minimum diameter flat head; of sufficient length to penetrate a minimum of 3/4 inch into sheathing or extend at least 1/8 inch through sheathing less than 3/4 inch thick.

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

* + - * 1. Underlayment Nails: Aluminum, stainless steel, or hot-dip galvanized-steel wire nails with low-profile metal or plastic caps, 1-inch minimum diameter.

Retain subparagraph below to comply with BCNYS requirements for locations where the basic design wind speed is equal to or greater than 140 mph or with IRC requirements for locations where the ultimate design wind speed (as defined in the RCNYS) is equal to or greater than 140 mph.

Provide with minimum 0.0134-inch thick metal cap, 0.010-inch thick power-driven metal cap, or 0.035-inch thick plastic cap; and with minimum 0.083-inch thick ring shank or 0.091-inch thick smooth shank of length to penetrate at least 3/4 inch into roof sheathing or to penetrate through roof sheathing less than 3/4 inch thick.

Retain "Nailer Strips" paragraph below if eave cants and wood nailer strips at ridges and hips are required. Revise to insert material requirements for wood if preferred.

* + - * 1. Nailer Strips: Comply with requirements in [**Section 061000 "Rough Carpentry."**] [**Section 061053 "Miscellaneous Rough Carpentry."**]
				2. Nails for Wood Strips: ASTM F1667; common or box, steel wire, flat head, and smooth shank; hot-dip galvanized.
			1. METAL FLASHING AND TRIM
				1. Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

Sheet Metal: [**Copper] [Stainless steel] [Zinc-tin alloy coated copper] [Anodized aluminum] [Aluminum, mill finished] <Insert requirements**>.

* + - * 1. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" for design, dimensions, metal, and other characteristics of the item unless otherwise specified in this Section or indicated on Drawings.

Retain "Apron Flashings," "Step Flashings," "Cricket and Backer Flashings," "Counterflashings," "Hip Flashings," "Open-Valley Flashings," "Closed-Valley Flashings," "Interwoven Closed-Valley Flashings," and "Drip Edges" subparagraphs below if Drawings do not fully detail these flashing conditions. Review recommendations in SMACNA's "Architectural Sheet Metal Manual" and NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems"; revise to suit Project.

Apron Flashings: Fabricate with lower flange extending a minimum of [**4 inches**] [**6 inches**] <**Insert dimension**> over and [**4 inches**] <**Insert dimension**> beyond each side of downslope slate shingles and [**6 inches**] <**Insert dimension**> up the vertical surface.

Retain "Step Flashings" subparagraph below for interweaving metal step flashings between succeeding courses of slate shingles that abut vertical surfaces such as chimneys, sidewalls, and skylights.

Step Flashings: Fabricate with a headlap of 3 inches and a minimum extension of [**4 inches**] [**5 inches**] <**Insert dimension**> both horizontally and vertically.

Retain "Cricket and Backer Flashings" subparagraph below if required.

Cricket and Backer Flashings: Fabricate with concealed flange extending a minimum of [24 inches**] <Insert dimension**> beneath upslope slate shingles, [6 inches**] <Insert dimension**> beyond each side of [**chimney] [skylight**], and [6 inches**] <Insert dimension**> above the roof plane.

Retain "Counterflashings" subparagraph below to protect top edges of apron, step, channel, cricket, and backer flashings from water intrusion.

Counterflashings: Fabricate to cover [4 inches**] <Insert dimension**> of base flashing measured vertically; and in lengths required so that no step exceeds [8 inches**] <Insert dimension**> and overall length is no more than [10 feet**] <Insert dimension**>.

Provide metal [**reglets] [receivers**] for installation.

Retain "Hip Flashings" subparagraph below if interwoven hip flashings are required for mitered or fantail hips.

Hip Flashings: Fabricate to length of slate shingle and to extend [3 inches**] <Insert dimension**> beyond joint of hip shingle with adjoining roof shingle.

Retain "Open-Valley Flashings," "Closed-Valley Flashings," or "Interwoven Closed-Valley Flashings" subparagraph below to suit Project. NRCA recommends using closed valleys only on roofs with slopes of 8:12 or greater. The BCNYS and the RCNYS include prescriptive requirements for valley flashings; verify requirements of authorities having jurisdiction.

Options in "Open-Valley Flashings" subparagraph below reflect NRCA recommendation for using minimum 18-inch wide sheet metal. SMACNA recommends minimum 10-inch wide flanges. SMACNA also recommends a minimum 1-inch high, inverted-V profile and a 2-inch high, inverted-V profile for slopes greater than 6:12 and for where dissimilar slopes join. Revise subparagraph to suit Project.

Open-Valley Flashings: Fabricate from metal sheet not less than [18 inches**] <Insert dimension**> wide in lengths not exceeding [10 feet**] <Insert dimension**>, with **[**1-inch**] <Insert dimension**> high, inverted-V profile water diverter at center of valley and equal flange widths of not less than [8 inches**] <Insert dimension**>.

Retain first subparagraph below if securing flange edges with cleats.

Hem flange edges for fastening with metal cleats.

Closed-Valley Flashings: Fabricate in lengths not exceeding [10 feet**] <Insert dimension**> and equal flange widths of [9 inches**] [**10 inches**] [**12 inches**] <Insert dimension**>.

Retain first subparagraph below if securing flange edges with cleats.

Hem flange edges for fastening with metal cleats.

Interwoven Closed-Valley Flashings: Fabricate in lengths [**equal to shingle exposure plus headlap plus** 2 inches**] <Insert dimension**> and equal flange widths of [9 inches**] [**10 inches**] [**12 inches**] <Insert dimension**>.

Retain "Drip Edges" subparagraph below if required at eave or rake edges.

Drip Edges: Fabricate in lengths not exceeding [10 feet] <Insert dimension> with roof-deck flange and 1-1/2-inch fascia flange with 3/8-inch drip at lower edge.

Roof-Deck Flange at Eaves: [Form to cover cant strip and fasten to roof deck] <Insert description>.

Roof-Deck Flange at Rakes: Form to extend minimum of [**2 inches**] <Insert dimension> onto roof deck.

Retain "Vent-Pipe Flashings" paragraph below for plumbing vents that penetrate roof. Revise if another flashing material is required, or delete paragraph and include requirements in Section 076200 "Sheet Metal Flashing and Trim."

* + - * 1. Vent-Pipe Flashings: ASTM B749, Type L51121, at least 1/16 inch thick. Provide lead sleeve sized to slip over and turn down into pipe, soldered to skirt at slope of roof and extending at least 4 inches from pipe onto roof.

Insert requirements for snow guards using Section 077253 "Snow Guards" as a basis if not specifying them in that Section.

* + - * 1. <**Insert snow-guard requirements**>.
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 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 slate-shingle and underlayment manufacturers' written installation instructions and with recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" applicable to products and applications indicated unless more stringent requirements are specified in this Section or indicated on Drawings.

Retain "Asphalt-Saturated Organic Felt" paragraph below if required. Because of slate shingles' long service lives, NRCA recommends using polymer-modified bitumen sheet instead of felt underlayment. Verify recommendations of local installers and slate-shingle manufacturers.

* + - * 1. Asphalt-Saturated Organic Felt: Install on roof deck parallel with and starting at eaves and fasten with underlayment nails.

Retain "Single-Layer Installation" or "Double-Layer Installation" subparagraph below to suit Project. Some shingle manufacturers recommend a double-layer installation. The National Slate Association recommends using double layer for roof slopes from 4:12 to 8:12, for 3/8-inch thick or thicker slates, and for slates smaller than 12 by 9 inches.

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. 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.

Side lap and starter course dimensions in "Double-Layer Installation" subparagraph below are based on 36-inch wide rolls of felt underlayment and are needed to maintain double-layer felt underlayment coverage with 2 inches to spare. Verify requirements of authorities having jurisdiction.

Double-Layer Installation:

Install a 19-inch wide starter course at eaves and completely cover with a 36-inch wide second course.

Install succeeding 36-inch wide courses lapping previous courses 19 inches in shingle fashion.

Lap ends a minimum of 4 inches.

Stagger end laps between succeeding courses at least 72 inches.

Retain first subparagraph below if cemented double layers of felt serve as water and ice-dam membranes or if required for additional protection. Some slate-shingle manufacturers recommend using cemented double layers. Self-adhering, polymer-modified bitumen sheet has largely replaced cemented double layers of felt as water and ice-dam protection.

Apply a continuous layer of asphalt roofing cement over starter course and on felt surface to be concealed by succeeding courses as each felt course is installed. Apply [**over entire roof**] [**at locations indicated on Drawings**].

Retain first subparagraph below for areas subject to high wind speeds. The BCNYS requires fastening of underlayment in grid pattern described below where the basic design wind speed is equal to or greater than 140 mph. The RCNYS requires the same fastening pattern where the ultimate design wind speed is equal to or greater than 140 mph.

Install fasteners in a grid pattern of 12 inches between side laps with 6-inch spacing at side and end laps.

Retain first subparagraph below if combining felt with self-adhering, polymer-modified bitumen sheet. NRCA recommends covering water and ice-dam protection with the roof-field underlayment.

Install felt over areas protected by self-adhering, polymer-modified bitumen 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. Verify requirements of authorities having jurisdiction for cap and base flashing at masonry or stucco walls and chimneys and revise subparagraph to suit Project.

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

Retain "Synthetic-Underlayment Top Layer" paragraph below if required as a top layer over an anchor layer of mechanically fastened, polymer-modified bitumen sheet or an anchor layer of self-adhering, polymer-modified bitumen sheet.

* + - * 1. Synthetic-Underlayment Top Layer: Install in accordance with manufacturer's written installation instructions and as second layer over anchor-layer underlayment.

Completely cover anchor-layer underlayment and install parallel with and starting at the eaves, with side laps offset halfway between side laps of underlying anchor layer.

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. In that case, the BCNYS and the RCNYS require at least 4-inch side laps. Verify requirements of manufacturers and authorities having jurisdiction.

Lap sides and ends as recommended in writing by manufacturer, but not less than [**2 inches** [**4 inches**] for side laps and 6 inches for end laps.

Stagger end laps from anchor-layer end laps and between succeeding top courses at interval recommended in writing by manufacturer, but not less than 72 inches.

Fasten with underlayment nails.

Retain subparagraph below for areas subject to high wind speeds. The BCNYS requires fastening of underlayment in grid pattern described below where the basic design wind speed is equal to or greater than 140 mph . The RCNYS requires the same fastening pattern where the ultimate design wind speed is equal to or greater than 140 mph.

Install fasteners in a grid pattern of 12 inches between side laps with 6-inch spacing at side and end laps.

Retain "Polymer-Modified Bitumen Sheet" paragraph below if required. NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" recommends using polymer-modified bitumen sheet in single-, double-, and two-layer installations. In two-layer installations, NRCA recommends using it as an anchor layer under a top layer of mechanically fastened, polymer-modified bitumen sheet or synthetic underlayment; as an anchor layer under a top layer of polymer-modified bitumen sheet adhered using hot bitumen or cold adhesive or a top layer of self-adhering, polymer-modified bitumen sheet; and as a top layer over an anchor layer of self-adhering, polymer-modified bitumen sheet.

* + - * 1. Polymer-Modified Bitumen Sheet: Install parallel with and starting at eaves.

Retain one of first three installation subparagraphs below to suit Project.

Retain second option in first subparagraph below with "Top-Layer Installation" subparagraph for one method of two-layer installation recommended by NRCA. NRCA also recommends using self-adhering, polymer-modified bitumen sheet for the anchor layer. Delete both subparagraphs and retain "Double-Layer Installation" subparagraph for another installation method recommended by NRCA.

[**Single-**] [**Anchor-**]Layer Installation:

Install on roof deck.

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. 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 6 inches.

Stagger end laps between succeeding courses at least 72 inches.

Fasten with underlayment nails.

Top-Layer Installation:

Install as a second layer over anchor-layer underlayment.

Completely cover anchor layer, with side laps offset halfway between side laps of underlying anchor layer.

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. In that case, the BCNYS and the RCNYS require at least 4-inches side laps. Verify requirements of authorities having jurisdiction.

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

Lap ends a minimum of 6 inches).

Stagger end laps from anchor-layer end laps and between succeeding top-layer courses at least 72 inches .

[**Fasten with underlayment nails] [Adhere to anchor layer in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F of equiviscous temperature] [Adhere to anchor layer in uniform coating of cold-applied adhesive**].

Double-Layer Installation:

Install on roof deck in overlapping layers with a half-width plus 1-inch wide starter course at eaves completely covered by full-width second course.

Install succeeding courses lapping previous courses by a half-width plus 1 inch in shingle fashion.

Lap ends a minimum of 6 inches.

Stagger end laps between succeeding courses at least 72 inches.

Fasten with underlayment nails.

Retain first subparagraph below for areas subject to high wind speeds. The BCNYS requires fastening of underlayment in grid pattern described below where the basic design wind speed is equal to or greater than 140 mph The RCNYS requires the same fastening pattern where the ultimate design wind speed is equal to or greater than 140 mph

Install fasteners in a grid pattern of 12 inches between side laps with 6-inch spacing at side and end laps.

Retain first subparagraph below if combining polymer-modified bitumen sheet with self-adhering, polymer-modified bitumen sheet used for water and ice-dam protection. NRCA recommends covering water and ice-dam protection with the roof-field underlayment.

Install sheets over areas protected by self-adhering, polymer-modified bitumen 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 sheets [**flush**] [**extended up not less than 4 inches**] <**Insert requirements**> against sidewalls, curbs, chimneys, and other roof projections.

Retain "Self-Adhering, Polymer-Modified Bitumen Sheet" paragraph below if required. NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" recommends using a single layer of self-adhering, polymer-modified bitumen sheet over the entire roof deck, although NRCA suggests covering it with a layer of another type of underlayment. NRCA recommends using it as an anchor layer for a top layer of mechanically fastened, polymer-modified bitumen sheet or synthetic underlayment and using it for a top layer over mechanically fastened, polymer-modified bitumen sheet.

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

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, polymer-modified bitumen sheet.

Retain "(Single-) (Anchor-)Layer Installation" subparagraph below if self-adhering, polymer-modified bitumen sheet covers the entire roof deck. NRCA suggests installing a second layer of another type of underlayment over self-adhering, polymer-modified bitumen sheet.

[**Single-**] [**Anchor-**]Layer Installation: Install over entire roof deck.

Retain "Top-Layer Installation" subparagraph below if required. Slates might stick to granule-surfaced top layers. Verify manufacturers' written instructions for top-layer installation and revise to suit Project.

Top-Layer Installation: Install as second layer over anchor-layer underlayment.

Completely cover anchor-layer underlayment.

Offset side laps halfway between side laps of underlying anchor layer and offset end laps from those of underlying anchor layer at least 72 inches.

Retain "Water and Ice-Dam Protection Installation" subparagraph below if a layer of self-adhering, polymer-modified bitumen sheet partially covers roof deck in areas vulnerable to moisture penetration; revise to suit Project. Because of slate's long service life, NRCA recommends extending the underlayment covering the roof field over the water and ice-dam protection layer.

Water and Ice-Dam Protection Installation: Install on roof deck where indicated [**below**] [**on Drawings**].

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**] [**36 inches**] <**Insert dimension**> beyond interior face of exterior wall.

Rakes: Extend from edges of rakes [**24 inches**] [**36 inches**] <**Insert dimension**> beyond interior face of exterior wall.

Verify requirements of authorities having jurisdiction for valley underlayment.

Valleys: Extend from lowest to highest point [**18 inches**] <**Insert dimension**> on each side of centerline.

Hips: Extend [**18 inches**] <**Insert dimension**> on each side.

Ridges: Extend [**36 inches**] <**Insert dimension**> on each side[**without obstructing continuous ridge vent slot**].

Sidewalls: Extend [**18 inches**] <**Insert dimension**> beyond sidewalls and return vertically against sidewalls not less than [**4 inches**] <**Insert dimension**>.

Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Extend [**18 inches**] <**Insert dimension**> beyond penetrating elements and return vertically against penetrating elements not less than [**4 inches**] <**Insert dimension**>.

Roof-Slope Transitions: Extend [**18 inches**] <**Insert dimension**> on each roof slope.

Cover underlayment within seven days.

Retain "Valley Underlayment" paragraph below if required and if installing self-adhering, polymer-modified bitumen sheet is not specified for water and ice-dam protection at valleys. Paragraph is applicable if using felt or polymer-modified bitumen sheet underlayment; synthetic-underlayment manufacturers recommend using self-adhering, polymer-modified bitumen sheet for valley underlayment. Paragraph is based on NRCA recommendations. Verify requirements of authorities having jurisdiction and revise to suit Project.

* + - * 1. Valley Underlayment: Install one layer of 36-inch wide underlayment centered in valley, running full length of valley, and on top of underlayment on field of roof that is woven through valley. Install all layers of underlayment in and through valley tight with no bridging.

Revise first subparagraph below to suit Project.

Use [**same underlayment as installed on field of roof] <Insert requirements**>.

Lap ends at least 12 inches in direction that sheds water, and seal with asphalt roofing cement.

Fasten to roof deck with underlayment nails located as far from valley center as possible and only to extent necessary to hold underlayment in place until installation of valley flashing.

* + - 1. INSTALLATION OF METAL FLASHING AND TRIM
				1. Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."

Install metal flashings in accordance with recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems."

Retain "Apron Flashings" paragraph below to provide a weatherproofing transition material where a roof area intersects a head wall. Common locations for apron flashings include the front downslope side of a dormer or chimney, curbed roof penetrations, and clerestory transitions.

* + - * 1. Apron Flashings: Extend lower flange over and beyond each side of downslope slate shingles and up the vertical surface.

Retain "Step Flashings" paragraph below for interweaving metal step flashings between succeeding courses of slate shingles that abut vertical surfaces such as chimneys, sidewalls, and skylights.

* + - * 1. Step Flashings: Install with a headlap of 3 inches and extend both horizontally and vertically. Install with lower edge of flashing just upslope of, and concealed by, butt of overlying slate shingle. Fasten to roof deck only.

Retain "Cricket and Backer Flashings" paragraph below if required.

* + - * 1. Cricket and Backer Flashings: Install against roof-penetrating elements, extending concealed flange beneath upslope slate shingles and beyond each side.
				2. Counterflashings: Coordinate with installation of base flashing and fit tightly to base flashing. Lap joints a minimum of 4 inches secured in a waterproof manner.

Install in reglets or receivers.

Retain "Hip Flashings" paragraph below if interwoven hip flashings are required for mitered or fantail hips.

* + - * 1. Hip Flashings: Install centered over hip with lower edge of flashing concealed by butt of overlying slate shingle. Fasten to roof deck.
				2. Open-Valley Flashings: Install centered in valleys, lapping ends at least [**8 inches**] <**Insert dimension**> in direction that sheds water.

Fasten upper end of each length to roof deck beneath overlap.

Retain one of first two subparagraphs below, or both, if required. NRCA recommends using cleats and stripping-in flashing using self-adhering, polymer-modified bitumen sheet strips adhered to metal flanges and similar valley underlayment in climates prone to heavy accumulations of snow and ice or regular freeze-thaw cycling.

Secure hemmed flange edges into metal cleats spaced [**12 inches**] [**24 inches**] <**Insert dimension**> apart and fastened to roof deck.

Adhere minimum [**9-inch**] <**Insert dimension**> wide strips of self-adhering, polymer-modified bitumen sheet to metal flanges and to [**underlying self-adhering, polymer-modified bitumen sheet**] <**Insert requirements**>. Place strips parallel to and over flanges so that they will be just concealed by installed shingles.

Retain subparagraph below for climates prone to heavy accumulations of snow and ice or regular freeze-thaw cycling.

Provide a closure at the end of the inverted-V profile of the valley metal to minimize water and ice infiltration.

* + - * 1. Closed-Valley Flashings: Install centered in valleys, lapping ends at least [**8 inches**] <**Insert dimension**> in direction that sheds water. Fasten upper end of each length to roof deck beneath overlap.

Retain one first or second subparagraph below, or both, if required. NRCA recommends using cleats and stripping-in flashing using self-adhering, polymer-modified bitumen sheet strips adhered to metal flanges and similar underlayment in climates prone to heavy accumulations of snow and ice or regular freeze-thaw cycling.

Secure hemmed flange edges into metal cleats spaced [**12 inches] [24 inches] <Insert dimension**> apart and fastened to roof deck.

Adhere minimum [**9-inch] <Insert dimension**> wide strips of self-adhering, polymer-modified bitumen sheet to metal flanges and to [**underlying self-adhering, polymer-modified bitumen] <Insert requirements**> valley underlayment.

* + - * 1. Interwoven Closed-Valley Flashings: Install centered in valleys at every shingle course overlapping the shingles in the preceding course similar to a step flashing treatment so that the butts just conceal the end of the flashing after installing the course. Fasten to roof approximately 8 inches away from center of the valley.

Retain "Rake Drip Edges" and "Eave Drip Edges" paragraphs below if applicable.

* + - * 1. Rake Drip Edges: Install over underlayment materials and fasten to roof deck.
				2. Eave Drip Edges: [**Install over wood cant strip and under underlayment materials; fasten to roof deck**] <**Insert description**>.
				3. Pipe Flashings: Form flashing around pipe penetrations and slate shingles. Fasten and seal to slate shingles.
			1. INSTALLATION OF SLATE SHINGLES
				1. Beginning at eaves, install slate shingles in accordance with manufacturer's written instructions and with details and recommendations in NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems."

Install wood strip cant at eave edges [**under underlayment materials] <Insert description**>.

Install shingle starter course chamfered face down.

* + - * 1. Install first and succeeding shingle courses chamfered face up. Install full-width first course at rake edge.

Offset joints of uniform-width slate shingles by half the shingle width in succeeding courses.

Offset joints of random-width slate shingles a minimum of 3 inches in succeeding courses.

The BCNYS and the RCNYS require a minimum 4-inch headlap for roof slopes less than 8:12, a minimum 3-inch headlap for slopes of 8:12 to slopes less than 20:12, and a 2-inch headlap for slopes of 20:12 or greater.

* + - * 1. Maintain a [**4-inch**] [**3-inch**] <**Insert dimension**> minimum headlap between succeeding shingle courses.

Retain one option in first paragraph below or revise paragraph if required to describe a graduated slate roof where shingle length and exposure gradually reduce between eaves and ridge.

* + - * 1. Maintain uniform exposure of shingle courses [**between eaves and ridge**] [**midway between eaves and ridge, and increase headlap of succeeding shingle courses to ensure uniform exposure on remaining shingle courses**].
				2. At eaves, extend shingle starter course and first course 1 inch over fasciae.
				3. At rakes, extend shingle starter course and succeeding courses [**1 inch**] [**2 inches**] over fasciae.
				4. Cut and fit slate neatly around roof vents, pipes, ventilators, and other projections through roof.
				5. Hang slate with [**two**] [**four**] slating nails for each shingle, with nail heads lightly touching slate.

Do not drive nails home, which draws slates downward, and do not leave nail heads protruding enough to interfere with the overlapping shingle above.

At vented ridges, terminate slate shingles to produce a uniform airspace on each side of ridge apex.

Retain one of three options in "Ridges" paragraph below for traditional treatment at uncapped or unvented ridges.

* + - * 1. Ridges: Install ridge slate in [**saddle**] [**strip saddle**] [**combed**] configuration.

Retain first subparagraph below for saddle ridges; delete for strip saddle or combed ridges.

Install and anchor wood nailer strips of thicknesses to match abutting courses of slate shingles, terminating nailer strip 3 to 4 inches from the eave. Cover with [**self-adhering, polymer-modified bitumen sheet**] <**Insert requirement**>, extending to underlying slate but concealed by ridge slate.

Retain first subparagraph below for saddle and combed ridges.

Lay ridge slate in bed of [**asphalt roofing cement] [butyl sealant**].

Retain first option in first subparagraph below for saddle ridge and strip saddle ridge; retain second option for combed ridge.

Anchor ridge slate to supporting wood nailer strip with [**two**] [**four**] <**Insert number**> nails for each slate shingle, without nails penetrating underlying slate.

Retain first subparagraph below for combed ridge.

Extend combed-ridge slate over leeward ridge slate by 1/8 to 1/4 inch. Seal ridge joint with elastomeric sealant.

Retain subparagraph below for strip saddle and combed ridges.

Cover heads of exposed nails at final ridge shingle with [**asphalt roofing cement**] [**butyl sealant**].

* + - * 1. Hips: Install and anchor slate hips in [**saddle**] [**mitered**] [**fantail**] configuration.

Retain first subparagraph below for saddle hip; delete for mitered and fantail hips.

Install and anchor wood nailer strips of thickness to match abutting courses of slate shingles.

Cover nailer strip with [**self-adhering, polymer-modified bitumen sheet**] <**Insert requirement**>, extending on to underlying slate but concealed by hip slate.

Anchor hip slate to nailer strip with [**two**] <**Insert number**> nails located in upper third of hip-slate length.

Retain first subparagraph below for saddle hips.

Notch starter shingle and first shingle course at hip to fit around nailer strips so no wood is exposed at ridge eave.

Lay hip slate in bed of [**asphalt roofing cement**] [**butyl sealant**].

Retain subparagraph below for mitered and fantail hips.

Seal hip centerline joint with elastomeric sealant.

* + - * 1. Open Valleys: Cut slate shingles to form straight lines at open valleys, trimming upper concealed corners of shingles. [**Maintain uniform width of exposed open valley**] [**Widen exposed portion of open valley 1/8 inch in 12 inches**] from highest to lowest point.

Do not nail shingles to valley metal flashings.

NRCA recommends using closed valleys only on roofs with slopes of 8:12 or greater.

* + - * 1. Closed Valleys: Cut slate shingles to form straight lines at closed valleys, trimming upper concealed corners of shingles.

Maintain uniform gap at centerline of valley of [**1/2 to 3/4 inch**] [**3/4 to 1 inch**].

Do not nail shingles to valley metal flashings.

Wire-tie shingles to roof deck on either side of flashing as required to secure shingles.

* + - * 1. Remove and replace damaged or broken slate shingles.
			1. INSTALLATION OF RIDGE ACCESSORIES

Retain this article if manufactured ridge caps or ridge vents are required.

* + - * 1. Metal Ridge Caps: Install units in accordance with manufacturer's written instructions.

Retain subparagraph below if covering ridge cap with slate shingles.

Install slate shingles into retention channels, butting adjacent shingles.

* + - * 1. Rigid-Plastic Ridge Vents: Install continuous ridge vents in accordance with manufacturer's written instructions. Fasten with slating nails of sufficient length to penetrate sheathing.
			1. ROOFING INSTALLER'S WARRANTY

Retain this article if required. Revise to include another Roofing Installer's Warranty form or as advised by Director’s Reprensentative. Coordinate with "Warranty" Article.

* + - * 1. WHEREAS <**Insert name**> of <**Insert address**>, herein called the "Roofing Installer," has performed roofing and associated work ("the work") on the following project:

Director’s Representative: <**Insert name of Director’s Representative**>.

Director’s Representative Address: <**Insert address**>.

Building Name/Type: <**Insert information**>.

Building Address: <**Insert address**>.

Area of the Work: <**Insert information**>.

Acceptance Date: <**Insert da**te>.

Warranty Period: <**Insert time**>.

Expiration Date: <**Insert date**>.

* + - * 1. AND WHEREAS Roofing Installer has contracted (either directly with Director’s Representative or indirectly as a subcontractor) to warrant the work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
				2. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that, during Warranty Period, Roofing Installer will, at Roofing Installer's own cost and expense, make or cause to be made such repairs to or replacements of the work as are necessary to correct faulty and defective work and as are necessary to maintain the work in a watertight condition.
				3. This Warranty is made subject to the following terms and conditions:

Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:

Lightning;

Insert required wind speed in first subparagraph below.

Peak gust wind speed exceeding <**Insert wind speed**> mph;

Fire;

Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;

Faulty construction of copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;

Vapor condensation on bottom of roofing; and

Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Director’s Representative.

When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Director’s Representative or by another responsible party so designated.

Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.

During Warranty Period, if Director’s Representative allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Director’s Representative engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Director’s Representative in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.

During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.

Director’s Representative shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.

This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Director’s Representative from other remedies and resources lawfully available to Director’s Representative in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Director’s Representative or a subcontract with Director’s Representative’s General Contractor.

* + - * 1. IN WITNESS THEREOF, this instrument has been duly executed this <**Insert day**> day of <**Insert month**>, <**Insert year**>.

Authorized Signature: <Insert signature>.

Name: <Insert name>.

Title: <Insert title>.

END OF SECTION 073126