SECTION 073113 - ASPHALT SHINGLES

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:

Glass-fiber-reinforced asphalt shingles.

Underlayment materials.

Ridge vents.

Metal flashing and trim.

* + - 1. DEFINITIONS
				1. Roofing Terminology: See ASTM D1079 for definitions of terms related to roofing Work in this Section.
			2. PREINSTALLATION MEETINGS
				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 at the Site 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 at the same time as a package.
				5. Product Data: For the following:

Asphalt shingles.

Underlayment materials.

Ridge vents.

Asphalt roofing cement.

Elastomeric flashing sealant.

* + - * 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 and for each color and blend specified, in sizes indicated.

Roof Shingles: One shingle selected from each of the manufacturer’s standard colors.

Cap Shingle: One shingle to match specified roof shingle color.

Nails: Two each type.

Felt Underlayment: Two 6 inch square pieces.

Perimeter Edge Metal: Full Section 6 inch long.

Delete following subparagraphs if material is not specified in Part 2.

Concealed Flashing: Two 6 inch square pieces.

Insulated Sheathing: One 4 inch square piece.

Ridge Vent: Full Section 6 inches square long.

Vented Eave Flashing: Full Section 6 inches square long.

Soffit Vent: Full Section 6 inches square long.

Insulation Baffles: Full Section 6 inches square long.

* + - * 1. Samples for Initial Selection:

For each type of asphalt shingle indicated.

For each type of accessory involving color selection.

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

Asphalt Shingles: Full size.

Ridge and Hip Cap Shingles: Full size.

Ridge Vent: 12-inch-long Sample.

* + - * 1. Quality Control Submittals; Manufacturer’s Warranty: Sample copy of the shingle manufacturer’s warranty.
				2. Closeout Submittals:

Maintenance Data: For asphalt shingles to include in maintenance manuals.

Materials warranties, including proof of purchase (dated, itemized sales receipts or invoices.)

Roofing Installer's warranty.

* + - 1. QUALITY ASSURANCE
				1. Fire Resistance Rating: The asphalt shingle roof system shall have an Underwriters Laboratories External Fire Resistance Rating as follows:

Asphalt Fiberglass Shingles: UL Class A.

The shingles specified in Part 2 are asphalt fiberglass, delete subparagraph below unless shingles specified in Part 2 are changed to a style only available as asphalt organic.

Asphalt Organic Shingles: UL Class C.

* + - * 1. Wind Resistance Rating: The asphalt shingle roof system shall have an Underwriters Laboratories “Wind Resistant” label.
				2. Shingle packages shall bear the UL fire resistance and wind resistant labels.

Delete paragraph below if concealed flashing is not used.

* + - * 1. The submitted concealed flashing sample may be tested and shall exceed the following:

Puncture the membrane with a #10 gage roofing nail and withdraw.

Upon withdrawal of nail, 50 percent of the nail shank shall be coated with asphalt.

* + - 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. WARRANTY

Include 007306 Supplementary Conditions - Warranty Extension.

* + - * 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.
				2. Manufacturer’s Warranty: In addition to the 2 year period specified above, furnish the shingle manufacturer’s warranty certifying that the shingles will not warp, shrink, or deteriorate, and that they are free from manufacturing defects as follows:

Delete systems below not specified in Part 2. Verify and coordinate warranty time frame with system specified in Part 2.

Heavy Duty Architectural Asphalt Shingles: 50 year warranty and 110 mph wind warranty.

Architectural Asphalt Shingles: 30 year warranty.

Asphalt Shingles (3-tab): 25 year warranty.

1. PRODUCTS
	* + 1. SYSTEM DESCRIPTION

Use paragraph below for roof system over heated buildings with ventilated attic space and no insulation on top of deck required - edit shingle type being used.

* + - * 1. Asphalt Shingle Roof System: Heavy Duty/Architectural/Asphalt fiberglass or organic shingles, felt underlayment, concealed flashing, and perimeter edge metal installed over the structural deck.

Use paragraph below for roof system over heated buildings when insulation on top of deck is required - edit shingle type being used.

* + - * 1. Asphalt Shingle Roof System: Heavy Duty/Architectural/Asphalt fiberglass or organic shingles, felt underlayment, concealed flashing, perimeter edge metal and ventilating nail base insulation board, installed over the structural deck.

Use paragraph below for roof system over unheated buildings - edit shingle type being used.

* + - * 1. Asphalt Shingle Roof System: Heavy Duty/Architectural/Asphalt fiberglass or organic shingles, felt underlayment, and perimeter edge metal installed over the structural deck.

Use paragraph below for roof system over unheated buildings with non-nailable or decks in poor condition - edit shingle type being used.

* + - * 1. Asphalt Shingle Roof System: Wood nailers and plywood sheathing installed over the existing structural deck and covered with heavy duty/architectural/ asphalt fiberglass or organic shingles, felt underlayment, and perimeter edge metal.

Use paragraph below for roof system over heated buildings with non-nailable or decks in poor condition - edit shingle type being used.

* + - * 1. Asphalt Shingle Roof System: Wood nailers and plywood sheathing installed over the existing structural deck and covered with heavy duty/architectural/ asphalt fiberglass or asphalt organic shingles, felt underlayment, perimeter edge metal and concealed flashing.
			1. SOURCE LIMITATIONS
				1. Obtain each type of product from single source from single manufacturer.
			2. PERFORMANCE REQUIREMENTS
				1. Exterior Fire-Test Exposure: Provide asphalt 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.
				2. Wind Resistance: Provide asphalt shingles that comply with requirements of ASTM D3161, Class F, and with ASTM D7158, Class H.
			3. GLASS-FIBER-REINFORCED ASPHALT SHINGLES

Use heavy duty architectural shingles below for large and/or monumental size buildings where a slate shingle look is desirable.

* + - * 1. Heavy Duty Architectural Asphalt Shingle, Laminated-Strip Asphalt Shingles: ASTM D3462, UL Classified, fiberglass or organic, heavy duty laminated, 3 dimensional, self-sealing, wind resistant shingle with 50 year warranty, and 110 mph wind warranty.

[Products:](http://www.specagent.com/Lookup?ulid=4726) Subject to compliance with requirements, provide one of the following:

CertainTeed Corporation; Saint-Gobain North America; Grand Manor Shingles.

[GAF](http://www.specagent.com/Lookup?uid=123457152154); Camelot II Shingles.

Owens Corning; Berkshire Shingles.

Approved equivalent.

Strip Size: Manufacturer's standard.

Exposure: 8-inches.

Algae Resistance: Granules resist algae discoloration.

Starter Course: Asphalt shingles with tabs removed, as recommended by the shingle manufacturer.

Color and Blends: As selected by Director’s Representative from manufacturer's full range.

Use architectural shingles below for medium and smaller size buildings where appearance / wood shake look is desirable – more material cost but less labor than standard 3 tab shingles.

* + - * 1. Architectural Asphalt Shingles:

UL Classified, fiberglass or organic, laminated, no cut out, 3 dimensional, self-sealing wind resistant shingle with 30 year warranty, ASTM D 3462.

Products: Subject to compliance with requirements, provide one of the following:

CertainTeed Corporation; Saint-Gobain North America; Landmark Premium Shingles.

[GAF](http://www.specagent.com/Lookup?uid=123457152154); Timberline NS Shingles.

Owens Corning; Oakridge Shingles.

Approved equivalent.

Algae Protection: Manufacturers maximum protection.

Starter Course: 90 lbs. mineral surfaced felt, ASTM D 249 or asphalt shingles with tabs removed.

Color and Blends: As selected by Director’s Representative from manufacturer's full range.

Use standard 3 tab shingles below for unimportant buildings where appearance is not an issue – less material cost but more labor than architectural shingle.

* + - * 1. Asphalt Shingles:

UL Classified, fiberglass or organic, three tab, square butt, self-sealing wind resistant shingle, with 25 year warranty, ASTM D 3462.

Products: Subject to compliance with requirements, provide one of the following:

CertainTeed Corporation; Saint-Gobain North America; XT25 Shingles.

GAF; Royal Sovereign Shingles.

Owens Corning; Supreme Shingles.

Approved equivalent.

Algae Protection: Manufacturers maximum protection.

Color and Blends: As selected by Director’s Representative from manufacturer's full range.

Starter Course: 90 lbs. mineral surfaced

* + - * 1. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

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

* + - 1. UNDERLAYMENT MATERIALS
				1. Organic Felt: Asphalt-saturated organic felts, nonperforated and complying with the following:

ASTM D226 Type I felt is most commonly used.

ASTM D226 Type I felt weighs 11.5 lb/sq. ft., and Type II felt weighs 26 lb/100 sq. ft. Select Type II for Architectural Asphalt Shingles if heavy type desired.

ASTM D226: **[Type I] [Type II]**.

"Self-Adhering, Polymer-Modified Bitumen Sheet" paragraph below describes products that resist leaks at roof areas prone to forming ice dams and other roof areas vulnerable to leakage. The polymer is typically SBS. It is available with granular or polymer-film slip-resistant surfaces. Installer preference is the only reason to choose one type of surface over the other. Revise requirements if specific surfaces are required. Also revise if products formulated for high temperatures are required for Project location or under metal flashing. NRCA's "The NRCA Roofing Manual: Steep-Slope Roof Systems" states that using self-adhering, polymer-modified bitumen sheet products formulated for high temperatures is generally unnecessary with asphalt shingles.

Retain thickness option 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 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.

Products: Subject to compliance with requirements, provide one of the following:

GCP Applied Technologies; Grace Ice & Water Shield.

NEI (Owens Corning); AC Granular Ice and StormSeal.

Approved equivalent.

* + - 1. RIDGE VENTS

Use below ridge vent when appearance and invisible lines are important – more resistant to physical damage.

* + - * 1. Shingle Over Ridge Vents:

Products: Subject to compliance with requirements, provide one of the following:

Air Vent Inc.; ShingleVent II.

GAF; Cobra Ridge Vent 3.

Cor-A-Vent Inc.; V-600E Ridge Vent.

Approved equivalent.

Accessories: Manufacturer’s standard or recommended straps, connectors, and end plugs.

Color: As selected by the Director’s Representative from the manufacturer’s standard colors.

Use below when appearance is not important – damages easily .

* + - * 1. Aluminum Ridge Vents:

Products: Subject to compliance with requirements, provide one of the following:

GAF; Master Flow 10’ Aluminum Ridge Vent AR10.

Approved equivalent.

Accessories: Manufacturer’s standard or recommended straps, connectors, and end plugs.

Finish: Manufacturer’s standard paint finish, color selected by Director’s Representative from the manufacturer’s standard colors.

Continuous half ridge vent systems for clearstories, single slope roofs, and shed roofs are available from most of the manufacturers listed in above and below, check manufacturer’s literature for details and numbers.

* + - * 1. Vented Eave Flashing:

Acceptable Material: Air Vent Inc.; Vented Drip Edge.

Approved equivalent.

Select material and color type below.

Material: Aluminum/Pre-Finished Steel.

Color: Selected by the Director’s Representative from the manufacturer’s standard colors.

* + - * 1. Continuous Soffit Vents:

Products: Subject to compliance with requirements, provide one of the following:

GAF; LSV8 Series Continuous Soffit Vents.

Air Vent, Inc.; Continuous Soffit Vents.

Approved equivalent.

Select material and color type below.

Material: Aluminum/PVC.

Color: As selected by the Director’s Representative from the manufacturer’s standard colors.

* + - * 1. Insulation Baffles:

Products: Subject to compliance with requirements, provide one of the following:

ADO Products; ProVent.

Plymouth Foam Building Products; Vent-Rite Attic Vents.

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.
				3. Roofing Nails: ASTM F1667, aluminum, stainless steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch-diameter, sharp-pointed, with a 3/8- to 7/16-inch-diameter flat head and of sufficient length to penetrate 3/4 inch into solid wood decking 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.

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.

Use paragraph below to install insulation with air space vent over top of existing wood decks if there is no attic space and ventilation under shingle system is desired. Coordinate with drawing details. Wind uplift data for mechanical fasteners must be shown on drawings. Consult with structural designer for values

* + - * 1. Ventilating Nail Base Insulation Board: Polyisocyanurate foam insulation panel bonded to non-continuous 3/4 inch spacers and 7/16 inch minimum thickness APA rated oriented waferboard on one side and to a fiberglass facer on the other side.

Products: Subject to compliance with requirements, provide one of the following:

Cornell Corporation (GAF); ThermaCal 1 Ventilated Roof Insulation Panels.

Hunter Panels; Cool-Vent.

Atlas Roofing Corporation; ACFoam CrossVent.

Approved equivalent.

Nominal Thickness and Minimum Aged R Value: Aged R value determined in accordance with TIMA Technical Bulletin No. 281.

Insert thickness and R-values below.

Minimum **[Insert Option Here]Inch / R: [Insert Option Here]**.

Nail Base Screws: Self tapping, corrosion resistant, insulation fasteners (without plates), minimum length 1-1/2 inches longer than the specified sheathing board thickness; “Deckfast Epoxy” or other insulation fastener approved by the sheathing board manufacturer.

* + - * 1. Pipe Flashing Boot:

Products: Subject to compliance with requirements, provide the following:

Molded one-piece elastomeric pipe boot, by Portals Plus, Inc.

Approved equivalent.

* + - 1. METAL FLASHING AND TRIM
				1. Comply with requirements in Section 076200 “Sheet Metal Flashing and Trim.”

Choose one of the metal choices below.

Sheet Metal: Aluminum, 0.032 inch thick. ASTM B 209, 3003-H14 alloy.

Select one finish.

Finish: Standard mill.

Fluorocarbon coating or (polyvinylidene Fluoride PVDF). Reverse side primed. Shipped with strippable protective tape.

Edit subparagraph below of custom color is required.

Color: As selected by the Director’s Representative from the manufacturer’s standard colors.

Stainless Steel: Dead soft fully annealed stainless steel, 26 gauge (0.018 inch) thick. ASTM A 666, Type 302/304, 2D dull finish.

Plain Copper: Cold rolled copper, ASTM B 370, 16 oz. (0.022 inch) thick.

Zinc-Tin Coated Copper: Cold rolled copper, ASTM B 370. Fifty percent Zinc, 50 percent Tin coating; ASTM B 350, Type 1, 16 oz. (0.026 inch) thick.

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

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
				1. Comply with asphalt 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.
				2. Asphalt-Saturated 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. Roofs with a slope of 4:12 or greater are usually installed with a single underlayment layer. The BCNYS and the RCNYS require double-layer felt underlayment for roofs with slopes from 2:12 to 4:12. 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. 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 over underlying course.

Lap ends a minimum of 6 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 underlayment serve as water and ice-dam membranes or if required for additional protection for low-slope applications. 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.

Retain first subparagraph below if combining self-adhering, polymer-modified bitumen sheet and felt underlayment.

Install felt underlayment on roof deck not covered by self-adhering, polymer-modified bitumen sheet unless otherwise specified in this Section or indicated on Drawings.

Lap sides of felt over self-adhering sheet not less than 4 inches in direction that sheds water.

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

Retain first subparagraph below for areas subject to high wind speeds. The BCNYS and the RCNYS require fastening of underlayment in grid pattern described below where the limiting 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 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.

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

Install metal flashings in accordance with recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."

Bed flanges of metal flashings using asphalt roofing cement or elastomeric flashing sealant.

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 asphalt shingles and up the vertical surface.

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

* + - * 1. Step Flashings: Install with a headlap of 2 inches and extend over underlying shingle and up the vertical face.

Install with lower edge of flashing just upslope of, and concealed by, butt of overlying 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 asphalt 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 "Open-Valley Flashings" paragraph below if metal open-valley flashings are required.

* + - * 1. Open-Valley Flashings: Install centered in valleys, lapping ends at least 9 inches in direction that sheds water. Fasten upper end of each length to roof deck beneath overlap.

Retain 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 self-adhering, polymer-modified bitumen valley underlayment in climates prone to heavy accumulations of snow and ice or regular freeze-thaw cycling.

Adhere minimum 9-inch-wide strips of self-adhering, polymer-modified bitumen sheet to metal flanges and to underlying self-adhering sheet, polymer-modified bitumen sheet.

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. Rake Drip Edges: Install over underlayment materials and fasten to roof deck.
				2. Eave Drip Edges: Install below underlayment materials and fasten to roof deck.
				3. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.
			1. INSTALLATION OF ASPHALT SHINGLES
				1. Install asphalt shingles in accordance with manufacturer's written instructions and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
				2. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip **[with tabs removed] [at least 7 inches wide]** with self-sealing strip face up at roof edge.

Extend asphalt shingles **[1/2 inch] [3/4 inch] <Insert dimension>** over fasciae at eaves and rakes.

Install starter strip along rake edge.

Retain first paragraph below for laminated-strip asphalt shingles. Diagonal installation is recommended by NRCA. Insert a particular offset pattern if required.

* + - * 1. Install first and remaining courses of laminated asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

Retain one offset pattern option in first paragraph below for three-tab-strip asphalt shingles. Diagonal installation is recommended by NRCA. According to NRCA, 6-inch offset pattern is the most commonly used. Verify that offset pattern retained is approved by manufacturer for asphalt shingle specified. Revise offset pattern if required.

* + - * 1. Install first and remaining courses of three-tab-strip asphalt shingles stair-stepping diagonally across roof deck with **[4-inch] [5-inch] [6-inch] [half-tab] [one-third-tab] [manufacturer's recommended]** offset pattern at succeeding courses, maintaining uniform exposure.

The BCNYS and the RCNYS both require fastening asphalt shingles with the minimum number of fasteners required by manufacturer, but not less than four fasteners per shingle strip. Some asphalt shingles require five fasteners per shingle strip. Six fasteners are typically required per shingle strip to resist high wind speeds. Verify fastening requirements for products specified, for design wind speeds in Project's location, and of authorities having jurisdiction. Usually indicate design wind speeds on Drawings with design wind forces determined by Project's structural Director’s Representative.

Asphalt strip shingles require a minimum of six fasteners per shingle where the roof is in one of the following categories:

 1. The basic wind speed is 110 miles per hour or greater and the eave is 20 feet or higher above grade.

 2. The basic wind speed is 120 miles per hour or greater.

See figure 1609 of the building code of New York State for basic wind speed map, consult with Structural Designer as required.

Slopes Up To 60 Degrees (20 on 12 slope): Install 4 fasteners per shingle.

Slopes Over 60 Degrees (20 on 12 slope): Install 6 fasteners per shingle. Place a one inch diameter dab of plastic cement under the center of each shingle tab above the cut out.

* + - * 1. Fasten asphalt shingle strips with a minimum of [four] [six] roofing nails, but not less than the number indicated in manufacturer's written instructions for roof slope and design wind speed indicated on Drawings and for warranty requirements specified in this Section.

Locate fasteners in accordance with manufacturer's written instructions.

Retain first subparagraph below for roofs with slopes greater than 18:12. NRCA recommends hand sealing (called "hand-tabbing") self-sealing shingles installed on sleep slopes.

Where roof slope exceeds 18:12, hand seal self-sealing asphalt shingles to improve the shingles' positive bond by applying asphalt roofing cement spots between course overlaps after nailing the upper course.

Retain first subparagraph below for roofs with slopes less than 4:12 between shingles to improve the wind resistance of self-sealing shingles applied on low slopes.

Where roof slope is less than 4:12, hand seal self-sealing asphalt shingles to improve the shingles' positive bond by applying asphalt roofing cement spots between course overlaps after nailing the upper course.

Retain subparagraph below if asphalt shingles are installed in cold weather and could be subject to high winds. Factory-applied, self-sealing strips do not activate at lower temperatures.

When ambient temperature during installation is below [50 deg F] <Insert temperature>, hand seal self-sealing asphalt shingles by applying asphalt roofing cement spots between course overlaps after nailing the upper course.

Retain "Woven Valleys" paragraph below if required. Woven valleys are generally limited to three-tab-strip shingles. Verify acceptance of valley treatment with manufacturers. NRCA does not recommend woven valleys.

* + - * 1. Woven Valleys: Extend succeeding asphalt shingle courses from both sides of valley **[12 inches] <Insert dimension>** beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.

Do not nail asphalt shingles within 6 inches of valley center.

Retain "Closed-Cut Valleys" paragraph below if required. Closed-cut valleys are the preferred form of valley treatment among roofing contractors for most multitab-strip and laminated-strip shingles. Verify acceptance of valley treatment with manufacturers.

* + - * 1. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley **[12 inches] <Insert dimension>** beyond center of valley.

Use one-piece shingle strips without joints in valley.

Fasten with extra nail in upper end of shingle. Install asphalt shingle courses from other side of valley and cut back to a straight line 2 inches short of valley centerline.

Trim upper concealed corners of cut-back shingle strips.

Do not nail asphalt shingles within 6 inches of valley center.

Set trimmed, concealed-corner asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.

Retain "Open Valleys" paragraph below if required. Some manufacturers do not recommend open valleys but will accept them. Verify acceptance of valley treatment with manufacturers.

* + - * 1. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips.

Widen exposed portion of open valley 1/8 inch in 12 inches from highest to lowest point.

Extend shingle a minimum of 5 inches over valley metal.

Set valley edge of asphalt shingles in a 3-inch wide bed of asphalt roofing cement.

Do not nail asphalt shingles to metal open-valley flashings.

* + - * 1. Ridge Vents: Install continuous ridge vents over asphalt shingles in accordance with manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing.
				2. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing-shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds.

Fasten with roofing nails of sufficient length to penetrate sheathing.

Retain subparagraph below if ridge vents are required.

Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

* + - 1. PROTECTION
				1. Do not perform the Work of this Section unless the Director’s Representative is present or unless they direct that the Work be performed during their absence.
				2. 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 rehabilitation work only.

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

* + - 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 Representative's. Coordinate with "Warranty" Article. Coordinate with shingle-manufacturer's warranty requirements to avoid duplication of responsibilities.

* + - * 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 date>**.

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 to the 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 the State from other remedies and resources lawfully available to the State 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.

* + - * 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 073113