

SECTION 073113 – ASPHALT SHINGLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Glass-fiber-reinforced asphalt shingles.
2. Underlayment materials.
3. Ridge vents.
4. Metal flashing and trim.

B. Related Sections:

1. Section 061600 – Sheathing.
2. Section 076200 – Sheet Metal Flashing and Trim.

C. Reference and Industry Standards:

1. The following reference standards shall be applicable to this Section:
 - a. New York City Building Code, **current** edition, as amended, inclusive of:
 - Chapter 15 Roof Assemblies and Rooftop Structures.
 - Chapter 16 Structural Design, §1608 Snow Loads.
 - Chapter 16 Structural Design, §1609 Wind Loads.
 - b. The current Enterprise Green Communities (EGC) Criteria, and the current New York City Overlay.
2. Industry Standards:
 - ASTM (American Society for Testing and Materials)
 - NRCA (National Roofing Contractors Association)
 - SMACNA (Sheet Metal & Air Conditioning Contractors' National Association)
 - UL (Underwriters Laboratories)

D. The current NYC Overlay of the current Enterprise Green Communities Criteria:

1. Mandatory Requirements: See the NYC Overlay of the EGC reference standard for full specifications.
 - a. All projects must achieve compliance with the mandatory criteria measures that are applicable:
 - Criterion 6.4: Healthier Material Selection
 - Criterion 6.9: Managing Moisture: Roofing and Wall Systems
 - Criterion 6.10: Construction Waste Management

2. Optional Project Requirements for Certification Points

- a. Additionally, rehab projects are required to achieve **55** optional points. Criteria with optional points related to this Specification Section include, but may not be limited to:
- Criterion 6.1: Ingredient Transparency for Material Health
 - Criterion 6.2: Recycled Content and Ingredient Transparency
 - Criterion 6.3: Chemical Hazard Optimization
 - Criterion 6.5: Environmentally Responsible Material Selection
 - Criterion 6.7: Regional Materials
 - Criterion 6.10: Construction Waste Management

1.2 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For the following:

1. Asphalt shingles.
2. Underlayment materials.
3. Ridge vents.
4. Asphalt roofing cement.
5. Elastomeric flashing sealant.

- B. Samples: For each exposed product and for each color and blend specified.

1.4 INFORMATIONAL SUBMITTALS

- A. Product test reports.
- B. Sample warranty.
- C. Documentation for compliance with Enterprise Green Communities Criteria.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized installer who is trained and approved by manufacturer.

1.6 WARRANTY

- A. Materials Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
1. Materials Warranty Period: 25 years from date of Substantial Completion, prorated, with first five (5) years non-prorated.

2. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds for 25 years from date of Substantial Completion.
3. Algae-Resistance Warranty Period: Asphalt shingles will not discolor for 25 years from date of Substantial Completion.
4. Workmanship Warranty Period: 25 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. 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.
- B. Snow Load on a roof with a slope greater than 5 degrees shall be calculated in accordance with Section 7.4 of publication ASCE 7: Minimum Design Loads and Associated Criteria for Buildings and Other Structures.
- C. Wind Resistance: Asphalt shingles shall be tested in accordance with ASTM D1758. Asphalt shingles shall meet the classification requirements of Table 1507.2.7(1) for the maximum basic wind speed per Section 1609 of the 2014 edition of the New York City Building Code.
- D. Energy Performance, ENERGY STAR: Provide asphalt shingles that are listed on the DOE's "ENERGY STAR Roof Product List" for steep-slope roof products.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Three-Tab-Strip Asphalt Shingles: ASTM D3462; glass-fiber reinforced, mineral-granule surfaced, and self-sealing; with tabs regularly spaced.
 1. Strip Size: Manufacturer's standard.
 2. Algae Resistance: Granules resist algae discoloration.
 3. Color and Blends: As selected by [**Design-Professional-of-Record**] [**Owner**] from manufacturer's full range.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.
- C. Asphalt shingle packaging shall bear a label to indicate compliance with ASTM D7158* and the required classification in Table 1507.2.7.1(1) of 2014 edition of the New York City Building Code.
 1. Class D – Passed at basic wind speed up to and including 116 miles per hour.
 2. Class G – Passed at basic wind speed up to and including 155 miles per hour.
 3. Class H – Passed at basic wind speed up to and including 194 miles per hour.

* The standard calculations contained in ASTM D7158 assume exposure category B or C and building height of 60 feet or less. Additional calculations are required for conditions outside of these assumptions.

2.3 UNDERLAYMENT MATERIALS

- A. Organic Felt: Asphalt-saturated organic felts, nonperforated and complying with the following:
 - 1. ASTM D226: Type I.
 - 2. ASTM D4869: Type I.
- B. Glass-Reinforced Felt: ASTM D6757, asphalt-saturated, glass-reinforced organic felt or inorganic fiber-based felt.
- C. Self-Adhering, Polymer-Modified Bitumen Sheet: ASTM D1970, minimum **[55-mil-]** **[50-mil-]** **[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.]**
 - 1. Top Surface: **[Sand]** **[Granule]** **[Textured polymer film]** **[Polyester]**.

2.4 RIDGE VENTS

- A. Rigid Ridge Vent: Manufacturer's standard, rigid-section, high-density, UV-stabilized plastic ridge vent for use under ridge shingles.
 - 1. Minimum Net Free Area: **<Insert area>**.
 - 2. Width: **<Insert dimension>**.
 - 3. Thickness: **<Insert dimension>**.
 - 4. Features:
 - a. Nonwoven geotextile filter strips.
 - b. External deflector baffles.
 - c. **<Insert feature>**.

2.5 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D4586 Type II, asbestos free.
- B. 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.
- C. Roofing Nails: Fasteners for asphalt shingles shall be galvanized or aluminum roofing nails, minimum 12 gauge (0.105 inches) shank with a minimum 3/8 inch-diameter head, of a length to penetrate through the roofing materials and a minimum of 3/4 inch into the roof sheathing. Where roof sheathing is less than 3/4 inch thick, the nails shall penetrate through the sheathing. Fasteners shall comply with ASTM F1667.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- D. Underlayment Nails: Aluminum, stainless steel, or hot-dip galvanized-steel wire nails with low-profile metal or plastic caps, 1-inch-minimum diameter.
 - 1. 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.

- E. Attachment: Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four (4) fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 21 units vertical in 12 units horizontal (21:12), shingles shall be installed as required by the manufacturer.

2.6 METAL FLASHING AND TRIM

- A. Comply with requirements in *Section 076200 – Sheet Metal Flashing and Trim*.
 - 1. Sheet Metal: Anodized aluminum.
- B. 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 indicated on Drawings.
 - 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.

PART 3 - EXECUTION

3.1 INSTALLATION OF UNDERLAYMENT MATERIALS

- A. 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**].
- B. Asphalt-Saturated Felt: Install on roof deck parallel with and starting at eaves and fasten with [**underlayment**] [**roofing**] nails.
 - 1. Double-Layer Installation:
 - a. Install a 19-inch-wide starter course at eaves and completely cover with a 36-inch-wide second course.
 - b. Install succeeding 36-inch-wide courses lapping previous courses 19 inches in shingle fashion.
 - c. Lap ends a minimum of 4 inches. Stagger end laps between succeeding courses at least 72 inches.
 - d. 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**].
 - 2. Install felt underlayment [**on roof deck not covered**] [**over areas protected**] by self-adhering, polymer-modified bitumen sheet unless otherwise specified in this Section [**or indicated on Drawings**].

- a. Lap sides of felt over self-adhering sheet not less than 4 inches in direction that sheds water.
 - b. Lap ends of felt not less than 6 inches over self-adhering sheet.
3. Install fasteners in a grid pattern of 12 inches between side laps with 6-inch spacing at side and end laps.
4. Terminate felt [**flush**] [**extended up not less than 4 inches**] against sidewalls, curbs, chimneys, and other roof projections.

C. Synthetic Underlayment:

1. Install on roof deck parallel with and starting at the eaves.
 - a. 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.
 - b. Stagger end laps between succeeding courses at interval recommended in writing by manufacturer, but not less than 72 inches.
 - c. Fasten with underlayment nails in accordance with manufacturer's written instructions.
 - d. Cover underlayment within period recommended in writing by manufacturer.
2. Install in single layer on roofs sloped at 4:12 and greater.
3. Install in double layer on roofs sloped at less than 4:12.
4. Install synthetic underlayment [**on roof deck not covered**] [**over areas protected**] by self-adhering, polymer-modified bitumen sheet unless otherwise specified in this Section or indicated on Drawings.
 - a. Lap sides of underlayment over self-adhering sheet not less than 4 inches in direction to shed water.
 - b. Lap ends of underlayment not less than 6 inches over self-adhering sheet.
5. Install fasteners in a grid pattern of 12 inches between side laps with 6-inch spacing at side and end laps.
6. Terminate synthetic underlayment [**flush**] [**extended up not less than 4 inches**] <Insert requirements> against sidewalls, curbs, chimneys, and other roof projections.

D. Self-Adhering, Polymer-Modified Bitumen Sheet: Install, wrinkle free, on roof deck in locations indicated on Drawings.

1. Comply with low-temperature installation restrictions of underlayment manufacturer.
2. Install lapped in direction that sheds water.
 - a. Lap sides not less than 4 inches.
 - b. Lap ends not less than 6 inches, staggered 24 inches between succeeding courses.
 - c. Roll laps with roller.
3. Prime concrete, masonry, and metal surfaces to receive self-adhering sheet.

4. Cover underlayment within seven days.
- E. Metal-Flashed, Open-Valley Underlayment: Install two layers of minimum 36-inch-wide underlayment centered in valley.
 1. Use same underlayment as installed on field of roof.
 2. Stagger end laps between layers at least 72 inches.
 3. Lap ends of each layer at least 12 inches in direction that sheds water, and seal with asphalt roofing cement.
 4. Fasten each layer 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.
 5. Lap roof-deck underlayment over first layer of valley underlayment at least 6 inches.

3.2 INSTALLATION OF METAL FLASHING AND TRIM

- A. Install metal flashings and trim to comply with requirements in *Section 076200 – Sheet Metal Flashing and Trim*.
 1. Install metal flashings in accordance with recommendations in the NRCA's Guidelines for Asphalt Shingle Roof Systems.
 2. Bed flanges of metal flashings using asphalt roofing cement or elastomeric flashing sealant.
- B. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.3 INSTALLATION OF ASPHALT SHINGLES

- A. Install asphalt shingles in accordance with manufacturer's written instructions and recommendations in the NRCA Guidelines for Asphalt Shingle Roof Systems.
- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip with tabs removed with self-sealing strip face up at roof edge.
 1. Extend asphalt shingles 3/4 inch over fasciae at eaves and rakes.
 2. Install starter strip along rake edge.
- C. 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.
- D. Install first and remaining courses of three-tab-strip asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- E. Fasten asphalt shingle strips with a minimum of 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.

1. Locate fasteners in accordance with manufacturer's written instructions.
 2. 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.
 3. 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.
 4. When ambient temperature during installation is below 50 deg F, hand seal self-sealing asphalt shingles by applying asphalt roofing cement spots between course overlaps after nailing the upper course.
- F. Woven Valleys: Extend succeeding asphalt shingle courses from both sides of valley 12 inches beyond center of valley, weaving intersecting shingle-strip courses over each other. Use one-piece shingle strips without joints in valley.
1. Do not nail asphalt shingles within 6 inches of valley center.
- G. Closed-Cut Valleys: Extend asphalt shingle strips from one side of valley 12 inches beyond center of valley.
1. Use one-piece shingle strips without joints in valley.
 2. 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.
 3. Trim upper concealed corners of cut-back shingle strips.
 4. Do not nail asphalt shingles within 6 inches of valley center.
 5. Set trimmed, concealed-corner asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.
- H. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips.
1. Maintain uniform width of exposed open valley from highest to lowest point.
 2. Extend shingle a minimum of 4 inches over valley metal.
 3. Set valley edge of asphalt shingles in a 3-inch-wide bed of asphalt roofing cement.
 4. Do not nail asphalt shingles to metal open-valley flashings.
- I. 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.
- J. 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.
1. Fasten with roofing nails of sufficient length to penetrate sheathing.
 2. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.

END OF SECTION 073113