

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Underlayment.

1.02 DEFINITION

- A. Roofing Terminology: See ASTM D 1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of asphalt shingle ridge vent and exposed valley lining indicated.
 - 1. Include similar Samples of trim and accessories involving color selection.

1.04 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For qualified Installer.
- B. Product Test Reports: Based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency, for asphalt shingles.
- C. Research/Evaluation Reports: For each type of asphalt shingle required, from the ICC.
- D. Warranties: Sample of special warranties.

1.05 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of asphalt shingle to include in maintenance manuals.

1.06 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Asphalt Shingles: 100 sq. ft. (9.3 sq. m) of each type, in unbroken bundles.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Source Limitations: Obtain ridge and hip cap shingles ridge vents felt or composite underlayment and self-adhering sheet underlayment from single source from single manufacturer.
- C. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

1. Exterior Fire-Test Exposure: Class A; ASTM E 108 or UL 790, for application and roof slopes indicated.

1.08 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated, weathertight location according to asphalt shingle manufacturer's written instructions. Store underlayment rolls on end on pallets or other raised surfaces. Do not double stack rolls.
 1. Handle, store, and place roofing materials in a manner to avoid significant or permanent damage to roof deck or structural supporting members.
- B. Protect unused underlayment from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.

1.09 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install asphalt shingles until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and temporary HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.
 1. Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended by manufacturer.

1.10 WARRANTY

- A. Special Warranty: Standard form in which manufacturer agrees to repair or replace asphalt shingles that fail in materials or workmanship within specified warranty period.
 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.
 - b. Structural failures including failure of asphalt shingles to self-seal after a reasonable time.
 2. Material Warranty Period: 40 years from date of Substantial Completion.
 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds up to 120 mph (50 m/s) .
 4. Algae-Discoloration Warranty Period: Asphalt shingles will not discolor 10 years from date of Substantial Completion.
 5. Workmanship Warranty Period: 12 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.01 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D 3462, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 1. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - a. GAF Materials Corporation. "Timberline Ultra 40"
 - b. CertainTeed Corporation "Landmark PRO"
 - c. Or approved equal.
 2. Butt Edge: Crenelated cut.
 3. Strip Size: Manufacturer's standard.
 4. Algae Resistance: Granules treated to resist algae discoloration.
 5. Color and Blends: As selected by Architect from manufacturer's full range.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.02 UNDERLAYMENT MATERIALS

- A. Felt: ASTM D 226, Type II (30 pound), asphalt-saturated organic felts, non-perforated.
- B. Breathable Roof Deck Protection: GAF Deck-Armor™ as required for manufacturer's warranty.
- C. Self-Adhering Sheet Underlayment, Granular Surfaced: ASTM D 1970, minimum of 55-mil- (1.4-mm-) thick sheet; glass-fiber-mat-reinforced, SBS-modified asphalt; mineral-granule surfaced; with release paper backing; cold applied.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing, Inc.
 - b. CertainTeed Corporation.
 - c. GAF Materials Corporation- WeatherWatch.
- D. Self-Adhering Sheet Underlayment, Polyethylene Faced: ASTM D 1970, minimum of 40-mil thick, slip-resisting, polyethylene-film-reinforced top surface laminated to SBS-modified asphalt adhesive, with release paper backing; cold applied.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Carlisle Coatings & Waterproofing, Inc.
 - b. Grace, W. R. & Co. - Conn.
 - c. GAF Materials Corporation- StormGuard.

2.03 RIDGE VENTS

- A. Rigid plastic ridge ventilator designed to allow the passage of hot air from attics while prohibiting snow infiltration. For use in conjunction with eave/ soffit intake ventilation products. Provides 18.0 sq. inches (11613 sq.mm/m) Net Free Ventilation Area per lineal foot. Cobra® Snow Country Advanced™ Ridge Vent (includes 3" (76mm) galvanized ring shank nails), by GAF® or approved equal.
- B. Flash-Vent: Provide Roof-2-Wall ridge ventilation as manufactured by Cor-A-Vent. where indicated on the drawings. Provide matching end caps. Install as recommended by the manufacturer.

2.04 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D 4586, Type II, asbestos free.
- B. Roofing Nails: ASTM F 1667; aluminum, stainless-steel, copper, or hot-dip galvanized-steel wire shingle nails, minimum 0.120-inch- (3-mm-) diameter, smooth shank, sharp-pointed, with a minimum 3/8-inch- (9.5-mm-) diameter flat head and of sufficient length to penetrate 3/4 inch (19 mm) into solid wood decking or extend at least 1/8 inch (3 mm) through plywood sheathing.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Felt Underlayment Nails: Aluminum, stainless-steel, or hot-dip galvanized-steel wire with low-profile capped heads or disc caps, 1-inch (25-mm) minimum diameter.
- D. Algae-Mold-Moss Termination Roofing Strip Material: Copper-Cat® Algae Terminator manufactured from double sided 99.9% pure grade copper. Install on each side of ridge shingles using copper nails and overlaps and sealant as per manufacturer's instructions.

Fifty-year Limited Warranty. Manufacturer: Copper-Cat; 1748 Traditional Drive, Suite B, Walled Lake, ME 48390; www.coppercat.com; tel.: 866.526.2228.

- E. Metal Accessory Paint: GAF Shingle-Match™ Accessory Paint to blend items such as Plumbing Vent Pipes, Exhaust fans, Flashings, Roof ventilators, etc. to match more closely to the installed Asphalt Shingle Roof color. Available in 12 oz. spray cans. Color(s) shall be: As selected by the Architect from the manufacturers full color offering.

2.05 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Sheet Metal: Copper 16-oz. /sq. ft. (0.56mm) copper sheet, complying with ASTM B 370.
- 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.
 - 1. Apron Flashings: Fabricate with lower flange a minimum of 5 inches (125 mm) over and 4 inches (100 mm) beyond each side of downslope asphalt shingles and 6 inches (150 mm) up the vertical surface.
 - 2. Step Flashings: Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 5 inches (125 mm) over the underlying asphalt shingle and up the vertical surface.
 - 3. Cricket and Backer Flashings: Fabricate with concealed flange extending a minimum of 24 inches (600 mm) beneath upslope asphalt shingles and 6 inches (150 mm) beyond each side of chimney and 6 inches (150 mm) above the roof plane.
 - 4. Open-Valley Flashings: Fabricate in lengths not exceeding 10 feet (3 m) with 1-inch- (25-mm-) high, inverted-V profile at center of valley and equal flange widths of 12 inches (300 mm).
 - 5. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.6-mm) drip at lower edge.
- C. Vent Pipe Flashings: ASTM B 370, 16 oz. / sq. ft., Provide 3" deep shop fabricated copper cap sized to slip over and turn down into pipe, solder to flashing sleeve with skirt at slope of roof, and extending at least 6 inches (152 mm) from pipe onto roof.
- D. Exterior acrylic rust resistant aerosol roof accessory paint. Each can is available in a wide variety of colors to compliment the roof. Shingle-Match™ Roof Accessory Paint by GAF® or approved equal.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provision has been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Single-Layer Felt or Deck-Armour Underlayment: Install on roof deck parallel with and starting at the eaves. Lap sides a minimum of 2 inches (50 mm) over underlying course. Lap ends a minimum of 4 inches (100 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm) or as recommended by the manufacturer. Fasten with roofing nails.
1. Install felt underlayment on roof deck not covered by self-adhering sheet underlayment. Lap sides of felt or underlayment over self-adhering sheet underlayment not less than 3 inches (75 mm) in direction to shed water. Lap ends of felt or underlayment not less than 6 inches (150 mm) over self-adhering sheet underlayment.
 2. Install fasteners at no more than 18 inch (450 mm) o.c.
- C. Double-Layer Felt Underlayment (for low-slope roofs less than 4:12): Install on roof deck parallel with and starting at the eaves. Install a 19-inch- (485-mm-) wide starter course at eaves and completely cover with full-width second course. Install succeeding courses lapping previous courses 19 inches (485 mm) in shingle fashion. Lap ends a minimum of 6 inches (150 mm). Stagger end laps between succeeding courses at least 72 inches (1830 mm). Fasten with roofing nails.
1. Apply a continuous layer of asphalt roofing cement over starter course and on felt underlayment surface to be concealed by succeeding courses as each felt course is installed. Apply over entire roof.
 2. Install Deck Armor underlayment on roof sheathing not covered by self-adhering sheet underlayment. Lap edges over self-adhering sheet underlayment not less than 6 inches (150 mm) in direction to shed water or as recommended by the manufacturer and 3" at side laps.
 3. Terminate underlayment extended up not less than 6 inches (1150 mm) against sidewalls, curbs, chimneys, and other roof projections.
 4. Install fasteners at no more than 12 inch (300 mm) o.c. completely cover all side laps, end laps and fasteners with tape.
 5. For high -wind location applications, apply tape over all fasteners at the center of the roll to prevent rain or snow from entering at the fasteners.
- D. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with low-temperature installation restrictions of underlayment manufacturer if applicable. Install at locations indicated below, lapped in direction to shed water. Lap sides not less than 3-1/2 inches (89 mm). Lap ends not less than 6 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.
1. Eaves: Extend from edges of eaves 36 inches (914 mm) beyond interior face of exterior wall.
 2. Rakes: Extend from edges of rake 36 inches (914 mm) beyond interior face of exterior wall.
 3. Valleys: Extend from lowest to highest point 18 inches (450 mm) on each side.
 4. Hips: Extend 18 inches (450 mm) on each side.
 5. Ridges: Extend 36 inches (914 mm) on each side without obstructing continuous ridge vent slot.
 6. Sidewalls: Extend beyond sidewall 18 inches (450 mm), and return vertically against sidewall not less than 6 inches (150 mm).
 7. Dormers, Chimneys, Skylights, and Other Roof-Penetrating Elements: Extend beyond penetrating element 18 inches (450 mm), and return vertically against penetrating element not less than 4 inches.
 8. Roof Slope Transitions: Extend 18 inches (450 mm) on each roof slope.

- E. Concealed, Valley Lining: Comply with NRCA's recommendations. Install a 36-inch- (914-mm-) wide felt underlayment centered in valley. Fasten to roof deck with roofing nails.
 - 1. Lap roof-deck felt underlayment over valley felt underlayment at least 6 inches (150 mm).
 - 2. Install a 36-inch- (914-mm-) wide strip of granular-surfaced valley lining centered in valley, with granular-surface face up. Lap ends of strips at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten to roof deck with roofing nails.
- F. Metal-Flashed, Open-Valley Underlayment: Install two layers of 36-inch- (914-mm-) wide felt underlayment centered in valley. Stagger end laps between layers at least 72 inches (1830 mm). Lap ends of each layer at least 12 inches (300 mm) in direction to shed water, and seal with asphalt roofing cement. Fasten each layer to roof deck with roofing nails.
 - 1. Lap roof-deck felt underlayment over first layer of valley felt underlayment at least 6 inches (150 mm).

3.03 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."
- B. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.
- C. Step Flashings: Install with a headlap of 2 inches (50 mm) and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.
- D. Cricket Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.
- E. Open-Valley Flashings: Install centered in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.
 - 1. Secure hemmed flange edges into metal cleats spaced 12 inches apart and fastened to roof deck.
 - 2. Adhere 9-inch wide strip of self-adhering sheet to metal flanges and to self-adhering sheet underlayment.
- F. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.
- G. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

3.04 ASPHALT SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual". In High Wind locations, installations shall comply with FEMA High Wind roof application criteria.
- B. Install starter strip along lowest roof edge, consisting of an asphalt shingle strip at least 7 inches (175 mm) wide with self-sealing strip face up at roof edge as recommended by the manufacturer. Provide manufacturer's required starter, hip and ridge accessory shingles required to meet specified warranty requirements.

1. Extend asphalt shingles 3/4 inch (19 mm) over fascia at eaves and rakes.
 2. Cement shingles to underlayment and each other in a 4" (102mm) width of asphalt plastic roof cement.
 3. Install starter strip along rake edge.
 4. Nail approximately 1-1/2" - 3" (38 - 76mm) above the butt edge of the shingles.
 5. Rake starter course should overlap eave edge starter strip at least 3" (76mm).
- C. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses or as recommended by the manufacturer to achieve random roof texture.
- D. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
- E. Fasten asphalt shingle strips with a minimum of six roofing nails located according to manufacturer's written instructions and FEMA requirements.
1. Where roof slope exceeds 20:12, seal asphalt shingles with asphalt roofing cement spots after fastening with additional roofing nails.
 2. Where roof slope is less than 4:12, seal asphalt shingles with asphalt roofing cement spots.
 3. When ambient temperature during installation is below 50 deg F (10 deg C), seal asphalt shingles with asphalt roofing cement spots.
 4. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
- F. Open Valleys: Cut and fit asphalt shingles at open valleys, trimming upper concealed corners of shingle strips. Maintain uniform width of exposed open valley from highest to lowest point.
1. Set valley edge of asphalt shingles in a 3-inch- (75-mm-) wide bed of asphalt roofing cement.
 2. Do not nail asphalt shingles to metal open-valley flashings.
- G. Ridge Vents: Install continuous ridge vents over asphalt shingles according to manufacturer's written instructions. Fasten with roofing nails of sufficient length to penetrate sheathing. Cut continuous vent slots through the sheathing, stopping 6 inches (152mm) from each end of the ridge.
1. On roofs with ridge board, make two slots 1-3/4 inches (44.5mm) wide, one on each side of the peak (3 1/2 inch (89mm) overall).
 2. Install ridge vent material along the full length of the ridge, including uncut areas.
 3. Butt ends of ridge vent material and join using roofing cement.
 4. Install eaves vents in sufficient quantity to equal or exceed the ridge vent area.
- H. Ridge and Hip Cap Shingles: Provide manufacturer's required ridge and hip shingles required to meet warranty conditions. 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.
1. Fasten ridge cap asphalt shingles to cover ridge vent without obstructing airflow.
- I. Penetrations
1. All Penetrations are to be flashed according to GAF®, ARMA and NRCA application instructions and construction details.
- J. Skylights and Roof Hatches
1. Consult the manufacturer of the skylight or roof hatch for specific installation recommendations.
 2. Skylights and roof hatches shall be installed with pre-fabricated metal flashings specifically designed for the application of the unit.

3.05 PROTECTION

- A. Protect installed products from foot traffic until completion of the project.
- B. Any roof areas that are not completed by the end of the workday are to be protected from moisture and contaminants.

END OF SECTION