



SECTION 07310

ASPHALT SHINGLE ROOFING

GAF DESIGN LINE

PREPARED BY:



PROJECT NO.:

Note: GAF does not practice architecture or engineering. This Design Line is provided as a guide specification and is based on criteria provided to GAF. GAF has not observed the jobsite conditions, contract specifications, or other documents and shall not be construed in any manner to be the designer of record.

GAF ASPHALT SHINGLE GUIDE SPECIFICATION

GENERAL

1.01 SECTION INCLUDES

- A Asphalt roofing shingles.
- B Leak barrier and roof deck protection.
- C Metal flashing associated with shingle roofing.
- D Attic ventilation.

1.02 RELATED SECTIONS

- A Section 06100 - Rough Carpentry: Framing, wood decking, and roof sheathing.
- B Section 07620 - Flashing and Sheet Metal: Sheet metal flashing not associated with shingle roofing; gutters and downspouts.
- C Section 08630 - Unit Skylights: Skylights

1.03 REFERENCES American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards

1. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 2. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 3. ASTM B 370 - Standard Specification for Copper Sheet and Strip for Building Construction.
 4. ASTM D 3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
 5. ASTM D 3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
 6. ASTM D 3462 – Standard Specification for Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules.
 7. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
 8. ASTM D 7158 - Standard Test Method for Wind-Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method).
 9. AC438-1011-R1 – New Acceptance Criteria for Alternative Asphalt Roofing Shingles
 10. **ASTM E 903 – Standard Test Method for Solar Absorptance, Reflectance, and Transmission of Materials Using Integrating Spheres.** Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TFWZ.R21)
 1. UL 790 - Tests for Fire Resistance of Roof Covering Materials.
 2. UL 997 - Wind Resistance of Prepared Roof Covering Materials.
 3. UL 2218 – Impact Resistance of Prepared Roof Covering Materials.
- C Asphalt Roofing Manufacturers Association (ARMA)
 - D Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
 - E National Roofing Contractors Association (NRCA)

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- F American Society of Civil Engineers (ASCE).
 - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
- G U.S. Green Building Council (USGBC)
- H Leadership in Energy and Environmental Design (LEED)
- I ENERGY STAR
- J Cool Roof Rating Council (CRRC)
- K Miami Dade County

1.04 DEFINITIONS

- A Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

1.05 LEED CERTIFICATION

- A Provide a roofing system that will achieve or aid in the qualification of points satisfying
 - 1. Sustainable Site credit 7.2 - Heat Island Effect - Roof.
 - 2. Materials & Resource credit 5 - Local and Regional Materials.

1.06 SUBMITTALS

- A Submit copies of GAF® product data sheets, detail drawings and samples for each type of roofing product.
- B L.E.E.D. submittal: Coordinate with Section 01115 - Green Building Requirements, for LEED certification submittal forms and certification templates.

1.07 QUALITY ASSURANCE

- A Manufacturer Qualifications: Provide all primary roofing products, including shingles, underlayment, leak barrier, and ventilation, by a single manufacturer.
- B Installer Qualifications: Installer must be approved for installation of all roofing products to be installed under this section.

1.08 REGULATORY REQUIREMENTS

- A Provide a roofing system achieving an Underwriters Laboratories (UL) Class A fire classification.
- B . Install all roofing products in accordance with all federal, state and local building codes.
- D All work shall be performed in a manner consistent with current OSHA guidelines.

1.09 PREINSTALLATION MEETING

- A General: For all projects in excess of 250 squares of roofing, a pre-installation meeting is strongly recommended.
- B Timing: The meeting shall take place at the start of the roofing installation, no more than 2 weeks into the roofing project.
- C Attendees: Meeting to be called for by manufacturer's certified contractor. Meeting's mandatory attendees shall include the certified contractor and the manufacturer's representative. Non-mandatory attendees shall include the owner's representative, architect or engineer's representative, and the general contractor's representative.
- D Topics: Certified contractor and manufacturer's representative shall review all pertinent requirements for the project, including but not limited to, scheduling, weather considerations, project duration, and requirements for the specified warranty.

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1.10 DELIVERY, STORAGE, AND HANDLING

- A Store all products in manufacturer's unopened, labeled packaging until they are ready for installation.
- B Store products in a covered, ventilated area, at temperature not more than 110 degrees F (43 degrees C); do not store near steam pipes, radiators, or in direct sunlight.
- C Store bundles on a flat, properly drained surface. Maximum stacking height shall not exceed GAF®'s recommendations. Store all rolls on end.
- D Store and dispose of solvent-based materials in accordance with all federal, state and local regulations.

1.11 WEATHER CONDITIONS

- A Proceed with work only when existing and forecasted weather conditions will permit work to be performed in accordance with GAF®'s recommendations

1.12 WARRANTY Provide to the owner a **GAF® Shingle & Accessory Ltd. Warranty** for:

- 1. GAF® Lifetime Shingles covering
 - a Single family detached homes owned by individuals the first
 - b Manufacturing defects: 100% coverage for materials for:
 - 10 years non-prorated, then 20% thereafter for all GAF Lifetime Shingles.
 - 5 years non-prorated, then 20% thereafter for GAF Royal Sovereign and Marquis Weathermax Shingles.
 - c Any other type of owner or building – 40 years with the first 5 years non - prorated.
 - d With the use of three or more GAF Accessory Products (GAF Ridge Cap Shingles, GAF Starter Strip Shingle, GAF Leak Barrier, GAF Roof Deck Protection, GAF Cobra
- 2. Against algae discoloration for 10 years
- B Provide to the owner a **GAF® WeatherStopper® Golden Pledge® Ltd Warranty** covering:
 - 1. Roofs installed by a Certified GAF® Master Elite™ Contractor only.
 - 2. Manufacturing defects: 100% coverage for materials and labor for:
 - a Single family detached homes owned by individuals the first
 - 50 years non-prorated, then 20% thereafter for all GAF lifetime shingles.
 - 20 years non-prorated, then 20% thereafter for GAF Marquis Weathermax and GAF Royal Sovereign Shingles.
 - b Any other type of owner or building – 40 years with the first 20 years non-prorated. (excludes Marquis WeatherMax and Royal Sovereign)
 - 3. Workmanship errors: 100% coverage for workmanship errors for:
 - a Single family detached homes owned by individuals - the first 25 years for after installation. (20 years for Marquis WeatherMax and Royal Sovereign)
 - b Any other type of owner or building - 20 years.
 - 4. Roof system NOT installed over an existing roof, all existing roof materials must be removed to the deck.
 - 5. Warranted against algae discoloration for 10 years

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6. Full roof installations (Roofs installed on portions of buildings do not qualify) using the following GAF® products.
 - a You must use GAF® Roof Deck Protection.
 - b You must use eligible GAF® Leak Barrier in valleys and around dormers, sidewalls, firewalls, chimneys, plumbing vents, and skylights. In the North, leak barriers must be used at all eaves at least 24 inch inside warm wall.
 - c You must use GAF® pre-cut starter strip products (only those with factory applied adhesive) at the eaves. Note: To obtain bonus wind coverage, you must use GAF® pre cut starter strip products (with factory applied adhesive) at the eaves and rakes and you must install each shingle using 6 nails. For Miami Dade County Florida, no adhesive on rakes. You must cement the starter strip in and nail along the rake.
 - d You must use eligible COBRA® ventilation with adequate intake ventilation. Master Flow® exhaust ventilation products can be substituted only if COBRA® ridge ventilation cannot be installed due to a structure's architecture. In any event, adequate ventilation should meet the following requirements:
 - i. Minimum net free ventilation area of 1 sq ft per 150 sq ft of ceiling area is required. When intake vents are located at the eaves and exhaust vents are located near the roof's peak (in a properly balanced system) for maximum air flow, ventilation may be reduced to 1 sq ft per 300 sq ft. If these standards are not met, GAF® cannot be responsible for damage caused by inadequate ventilation.
 - e You must use GAF® Ridge Cap Shingles or shingles that correspond to the shingle product you are installing.
 - f You must use eligible GAF® Roofing Shingles.
 - g New metal flashings must be installed. Metal drip edge must be used at eaves and is recommended at rake edges.
 7. In addition to the requirements listed above, you installer must register and pay for this warranty. On projects that total more than 250 squares, the permanent Golden Pledge® Ltd Warranty will be issued only if the project passes GAF®'s final inspection. GAF® reserves the right to withhold the warranty if the roof has not been installed according to GAF®'s written application instructions. GAF® also strongly recommends that your Master Elite® Contractor schedule a start-up and at least one interim inspection on projects of 250 squares or more by contacting GAF® at least three weeks prior to the start of roof work.
- C Provide to the owner a **GAF® WeatherStopper® Silver Pledge® Ltd Warranty** covering:
1. Roofs installed by a Certified GAF® Master Elite™ Contractor only.
 2. Manufacturing defects: 100% coverage for materials and labor for:
 - a Single family detached homes owned by individuals the first
 - 50 years non-prorated, then 20% thereafter for all GAF lifetime shingles.
 - 20 years non-prorated, then 20% thereafter for GAF Marquis Weathermax and GAF Royal Sovereign Shingles.
 - b Any other type of owner or building – 40 years with the first 20 years non-prorated. (excludes Marquis WeatherMax and Royal Sovereign)
 3. Workmanship errors: 100% coverage for workmanship errors for:

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- a Single family detached homes owned by individuals - the first 10 years for after installation. (20 years for Marquis WeatherMax and Royal Sovereign)
 - b Any other type of owner or building - 10 years.
 4. Roof system NOT installed over an existing roof, all existing roof materials must be removed to the deck.
 5. Warranted against algae discoloration for 10 years
 6. Full roof installations (Roofs installed on portions of buildings do not qualify) using the following GAF® products.
 - a If a new nail base insulated deck system is being installed, you must install GAF Cornell Ventilated Nail Base Roof Insulation (covered only by a separate ThermaCal® Nail Base Roof Insulation Panels Ltd. Warranty).
 - b You must use GAF® Roof Deck Protection.
 - c You must use eligible GAF® Leak Barrier in valleys and around dormers, sidewalls, firewalls, chimneys, plumbing vents, and skylights. In the North, leak barriers must be used at all eaves at least 24 inch inside warm wall.
 - d You must use GAF® pre-cut starter strip products (only those with factory applied adhesive) at the eaves. Note: To obtain bonus wind coverage, you must use GAF® pre cut starter strip products (with factory applied adhesive) at the eaves and rakes and you must install each shingle using 6 nails. For Miami Dade County Florida, no adhesive on rakes. You must cement the starter strip in and nail along the rake.
 - e You must use eligible COBRA® ventilation with adequate intake ventilation. Master Flow® exhaust ventilation products can be substituted only if COBRA® ridge ventilation cannot be installed due to a structure's architecture. In any event, adequate ventilation should meet the following requirements:
 - i. Minimum net free ventilation area of 1 sq ft per 150 sq ft of ceiling area is required. When intake vents are located at the eaves and exhaust vents are located near the roof's peak (in a properly balanced system) for maximum air flow, ventilation may be reduced to 1 sq ft per 300 sq ft. If these standards are not met, GAF® cannot be responsible for damage caused by inadequate ventilation.
 - f You must use GAF® Ridge Cap Shingles or shingles that correspond to the shingle product you are installing.
 - g You must use eligible GAF® Roofing Shingles.
 - h New metal flashings must be installed. Metal drip edge must be used at eaves and is recommended at rake edges.
 7. In addition to the requirements listed above, you installer must register and pay for this warranty. On projects that total more than 250 squares, the permanent Golden Pledge® Ltd Warranty will be issued only if the project passes GAF®'s final inspection. GAF® reserves the right to withhold the warranty if the roof has not been installed according to GAF®'s written application instructions. GAF® also strongly recommends that your Master Elite® Contractor schedule a start-up and at least one interim inspection on projects of 250 squares or more by contacting GAF® at least three weeks prior to the start of roof work.
- D Provide to the owner a **GAF® Weather Stopper® System Plus Ltd Warranty** covering:
1. Roofs installed by a Authorized Home Builder, Certified Contractor or Certified GAF® Master Elite™ Contractor only.

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2. Manufacturing defects: 100% coverage for materials and labor for:
 - a Single family detached homes owned by individuals the first
 - 50 years non-prorated, then 20% thereafter for all GAF lifetime shingles.
 - 20 years non-prorated, then 20% thereafter for GAF Marquis Weathermax and GAF Royal Sovereign Shingles.
 - b Any other type of owner or building – 40 years with the first 20 years non-prorated. (excludes Marquis WeatherMax and Royal Sovereign)
 3. Warranted against algae discoloration for 10 years
- E Provide to the owner a **GAF® All American Pledge™ Guarantee**
1. Provide to the owner a GAF® WeatherStopper® Golden Pledge® Ltd Warranty for the Steep Slope System covering:
 - a Roofs installed by a Certified GAF® Master Elite™ Contractor only.
 - b Manufacturing defects: 100% coverage for materials and labor for:
 - i. Single family detached homes owned by individuals the first
 - 50 years non-prorated, then 20% thereafter for all GAF lifetime shingles.
 - 20 years non-prorated, then 20% thereafter for GAF Marquis Weathermax and GAF Royal Sovereign Shingles.
 - ii. Any other type of owner or building – 40 years with the first 20 years non-prorated. (excludes Marquis WeatherMax and Royal Sovereign)
 - c Workmanship errors: 100% coverage for workmanship errors for:
 - i. Single family detached homes owned by individuals - the first 25 years for after installation. (20 years for Marquis WeatherMax and Royal Sovereign)
 - ii. Any other type of owner or building - 20 years.
 2. Roof system NOT installed over an existing roof, all existing roof materials must be removed to the deck.
 3. Warranted against algae discoloration for 10 years
 4. Provide Manufacturers standard WeatherStopper® Diamond Pledge™ Guarantee for the Low Slope system covering:
 - a Single source **Edge-to-Edge** coverage* and no monetary limitation, where the manufacturer agrees to repair or replace components in the roofing system and pre-approved metal edge details, which cause a leak due to a failure in materials or workmanship.
 - i Duration: (20) Twenty years from the date of completion
- F Provide to the owner a **GAF Cornell® ThermaCal Nail Base Roof Insulation Ltd. Warranty.**
- a TBD.
 - i. Duration: (15) Fifteen years from the date of completion

PART II PRODUCTS

2.01 MANUFACTURER

- A Acceptable Manufacturer: GAF®, 1 Campus Drive, Parsippany, NJ 07054. Tel: 1-973-628-3000.

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- B Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.02 VENTILATED ROOF INSULATION PANELS

- A Preassembled panel consisting of a oriented strand board top surface a wood spacer block separating a layer of Isocyanurate insulation on the bottom, **ThermaCal® 1 Ventilating Roof Insulation Panel** by GAF-Cornell.

1. 7/16", 5/8", 3/4" OSB or plywood *****Select A Thickness*****
2. 1", 1-1/2", 2" wood spacers blocks *****Select A Thickness*****

- B Preassembled panel with two layers of oriented strand board separated by spacer blocks and isocyanurate insulation on the bottom, **ThermaCal® 2 Ventilating Roof Insulation Panel** by GAF-Cornell.

1. 7/16", 5/8", 3/4" OSB or plywood *****Select A Thickness*****
2. 1", 1-1/2", 2" wood spacers blocks *****Select A Thickness*****

2.03 SHINGLES

- A Granule surfaced, self-sealing asphalt shingle with a strong fiberglass reinforced Micro Weave core and mineral granule surfacing. Special cut tabs and bold profile provide a rugged hand-split shake appearance with an 8 in. exposure. Features highly reflective roofing granules and rated by the Cool Roof Rating Council (CRRC) for use in a Title 24 compliant project; UL 790 Class A rated with UL 997 Wind Resistance Label; ASTM D 7158, Class H; ASTM D 3161, Type 1; ASTM D 3018, Type 1; ASTM D 3462; AC438 compliant; CSA 123.5-98; Dade County Approved, Florida Building Code Approved, Texas Department of Insurance Approved, ICC Report Approval; Grand Sequoia® Reflector Series Lifetime Designer Shingles, by GAF®.

1. Color: As selected from manufacturers' full range.
2. Color: _____

2.04 HIP AND RIDGE SHINGLES

- A High profile self sealing hip and ridge cap shingle matching the color of selected roof shingle. Each bundle covers approx. 20 lineal feet (6.10m). **Timbertex® Premium Ridge Cap Shingles**, by GAF®.
- B Distinctive self sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 31 lineal feet (9.45m) with an 8 inch (203mm) exposure. **Ridglass™ 10"** Ridge Cap Shingles by GAF®.
- C Distinctive self sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 31 lineal feet (9.45m) with an 8 inch (203mm) exposure **Ridglass™ 8"** Ridge Cap Shingles by GAF®.
- D Distinctive self sealing hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 25 lineal feet (7.62m) with a 6 2/3 inch (169mm) exposure. **Seal-A-Ridge®** Ridge Cap Shingles by GAF®.
- E Distinctive hip and ridge cap shingle complementing the color of selected roof shingle. Each bundle covers approx. 33.3 lineal feet (10.15m) with a 5 5/8 inch (147mm) exposure. **Z® Ridge** Shingles by GAF®.

2.05 STARTER STRIP

- A Self sealing starter shingle designed for premium roof shingles. Each bundle covers approx. 100 lineal feet (30.48m) for English and metric shingles or 50 lineal feet (15.24m) for oversized shingles. **WeatherBlocker™** Eave/Rake Starter Strip by GAF®.

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- B Self sealing starter shingle designed for all roof shingles. Each bundle covers approx. 120 lineal feet (36.58m). **ProStart™** Starter Strip by GAF®.
- C Pre-cut, color coordinated starter strip shingle designed as a second starter course for shingles with large cut-outs. Each bundle covers approx.. 60 lineal feet (18.29 m) **StarterMatch™** Starter Strip by GAF®.

2.06 LEAK BARRIER

- A Self-adhering, self-sealing, bituminous leak barrier surfaced with fine, skid-resistant granules. Approved by UL, Dade County, ICC, State of Florida and Texas Department of Insurance. Each roll contains approx. 150 sq ft (13.9 sq.m.), 36" X 50' (0.9m x 20.3m) or 200 sq ft (18.6 sq.m.), 36" X 66.7' (0.9m x 20.3m). **WeatherWatch®** Leak Barrier, by GAF®.
- B Self-adhering, self-sealing, bituminous leak barrier surfaced with a smooth polyethylene film. Approved by UL, Dade County, ICC, State of Florida and Texas Department of Insurance. Each Roll contains approx. 200 sq ft. (18.6 sq.m.), 36" X 66.7' (0.9m x 20.3m), and 60 mils thick. **StormGuard®** Leak Barrier, by GAF®.

2.07 SHINGLE UNDERLAYMENT

- A Premium, water repellent, breather type non-asphaltic underlayment. UV stabilized polypropylene construction. Meets or exceeds ASTM D226 and D4869. Approved by Dade County, Florida Building Code, and ICC. Each roll contains approximately 10 squares (1003 sq. ft.) of material and is 54 in. x 223 ft. **Deck-Armor™** Premium Breathable Roof Deck Protection, by GAF®.
- B Synthetic, non-asphaltic, non-woven, anti-skid back coated, polypropylene constructed non breathable underlayment. Meets or exceeds ASTM D226 and D4869 approved by UL, Florida Building Code, ICC and CSA A220.1. Each roll contains approximately 10 squares (1000 gross sq. ft.) of material and is 48 in. x 250 ft. (14.6 m x 76.2 m), **Tiger-Paw™** Roof Deck Protection by GAF®.
- C Water repellent, breather type cellulose/glass fiber composite roofing underlayment. Meets or exceed ASTM D226 and D4869 and approved by UL and the Florida Building Code. Each roll contains approximately 4 squares (432 sq. ft.) of material and is 36" x 144" **Shingle-Mate®** Roof Deck Protection, by GAF®.
- D Premium, all-purpose fiberglass reinforced SBS modified underlayment. Meets or exceeds ASTM D226. Approved by UL and ICC. Each roll contains 2 squares (20.06 sqm.) of material and is 39.37 in. x 65.8 ft. (1m x 20m), **Roof Pro™** SBS Modified All-Purpose Underlayment by GAF®.
- E Non-woven fiberglass mat underlayment coated on both sides using a highly filled polymer. Provides a fire barrier and water resistant. Approved by Dade County, Florida Building Code, and ICC approval. Each roll contains 350 gross sq ft (32.52 m²) of material and is 42 in. x 100 ft. (1.07 m x 30.48 m) **VersaShield®** Fire-Resistant Roof Deck Protection by GAF®.
- F #15 Roofing Underlayment – By Others: Water repellent breather type cellulose fiber building paper. Meets or exceeds the requirements of ASTM D-4869 Type I.
- G #30 Roofing Underlayment - By Others: Water repellent breather type cellulose fiber building paper. Meets or exceeds the requirements of ASTM D-4869 Type II.

2.08 ROOFING CEMENT

- A Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II.

2.09 ROOF ACCESSORIES

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- A Exterior acrylic rust resistant aerosol roof accessory paint. Each 6 oz can is available in boxes of 6 and in a wide variety of colors to compliment the roof. **Shingle-Match™** Roof Accessory Paint by GAF®.
- B [UV stable solid molded PVC compression collar](#), [Kynar PVDF coated 24 guage galvanized flange](#), [Ultimate Pipe Flashing](#) by Lifetime Tool.

2.10 ATTIC VENTILATION

A Ridge Vents

1. Flexible rigid plastic ridge ventilator designed to allow the passage of hot air from attics, while resisting snow infiltration. For use in conjunction with eave/soffit ventilation products. Provides 12.5 sq inches Net Free Ventilation Area per lineal foot (26460 sq.mm/m). Each package contains 20 lineal feet (6.10m) of vent. **Cobra® Ridge Runner™** Ridge Vent by GAF®.
2. Flexible ridge ventilator designed to allow the passage of hot air from attics. For use in conjunction with eave/ soffit intake ventilation products. Provides 16.9 inches (1430 mm/m) Net Free Ventilation Area (Hand Nail) and 14.1 inches (1193 mm/m) Net Free Ventilation Area (Nail Gun) per lineal foot. **Cobra® Exhaust Vent**, by GAF®.
3. Rigid plastic ridge ventilator designed to allow the passage of hot air out of attics. For use in conjunction with eave/ soffit intake ventilation products. Provides 18.0 sq inches (38102 sq.mm/m) in Net Free Ventilation Area per lineal foot. Each package contains 40 lineal feet (12.19m) of vent. **Cobra® Rigid Vent 3™** ridge vent (includes 3" (76mm) galvanized ring shank nails), by GAF®
4. 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 (19051 sq.mm/m) Net Free Ventilation Area per lineal foot. Each package contains 40 lineal feet (12.19m) of vent. **Cobra® Snow Country™** or **Cobra® Snow Country Advanced™** Ridge Vent (includes 3" (76mm) galvanized ring shank nails), by GAF®.

B Fascia and Soffit/Under Eave Vents

1. Flexible rigid plastic ridge ventilator designed to allow the passage of hot air out of attics at the roof top along the eaves. For use in conjunction with ridge ventilation products. Provides 9.0 sq inches (11613 sq.mm/m) in NFVA per lineal foot. Each package contains 40 lineal feet (12.19m) of vent, **Cobra® IntakePro™** Rooftop Intake Vent (includes 1-3/4" (44.5 mm) coil nails), by GAF®
2. Flexible ridge ventilator designed to allow the passage of air into thru the fascia. 1"x3" (25 mm x 76mm) provides a Net Free Ventilation Area of 11 square inches per foot and 1½" x3" (38 mm x 76 mm) provides a Net Free Ventilation Area of 16 square inches per foot. **Cobra® Fascia Vent**, by GAF®.
3. Surface mounted closeable soffit vent with intrgal screen to help prevent wildfire embers from being drawn into the attic. 16.5" x 9" (419 mm x 229 mm) paintable finish providing 56 sq. in. (36,131 sq mm) of NFA, **MasterFlow® EmberShield® Closeable Soffit Vent** by GAF
4. Surface mounted, screened aluminum, corrosion resistant soffit vent. **MasterFlow™ EAC** Soffit Vent by GAF®.
5. Surface mounted, high impact resin, oval snap-in designed soffit vent. **MasterFlow™ EAP** Soffit Vent by GAF®.
6. Continuous aluminum 8ft section soffit vent. **MasterFlow™ LSV8** Series Soffit Vent by GAF®.

C Hip Vents

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1. Flexible low profile rigid plastic ridge ventilator designed to allow the passage of hot air from attics, while resisting rain and snow infiltration. For use in conjunction with eave/soffit ventilation products. Provides 9 sq inches Net Free Ventilation Area per lineal foot (19,046 sq.m/m). Each package contains 40 lineal feet (12.19m) of vent. **Cobra® Hip Vent Exhaust Vent** by GAF®.

D Solar Powered Vents

1. High powered solar powered roof exhaust vent designed to remove damaging heat and moisture from attics. Each vent provides 750 CFM and is solar powered to help reduce related utility costs. **Green Machine™ High Powered Solar Powered Roof Exhaust Vent**, by GAF®.
2. Solar powered roof exhaust vent designed to remove damaging heat and moisture from attics. Each vent provides 500 CFM and is solar powered to help reduce related utility costs. **Green Machine™ Solar Powered Roof Exhaust Vent**, by GAF®.
3. Solar powered intake booster vent designed for houses with insufficient soffit ventilation. Each vent provides up to 500 CFM airflow and is solar powered to help reduce related utility costs. **Green Machine™ Solar Powered Intake Booster™ Vent**, by GAF®.
4. Solar powered gable mounted exhaust ventilators designed to remove damaging heat and moisture from attics. Each vent provides 500 CFM and is solar powered to help reduce related utility costs. **Green Machine™ Solar Powered Gable Vent**, by GAF®.

E Dual Powered Vents

1. Dual powered roof exhaust vent designed to remove damaging heat and moisture from attics. Each vent provides 500 CFM and is solar and electric powered to provide continuous operation and help reduce related utility costs. **Green Machine™ Dual Powered Roof Exhaust Vent**, by GAF®.
2. Dual powered gable mounted exhaust ventilators designed to remove damaging heat and moisture from attics. Each vent provides 500 CFM and is solar and electric powered to provide continuous operation and help reduce related utility costs. **Green Machine™ Dual Powered Gable Vent**, by GAF®.

F Powered Vents

1. Powered, rooftop mounted exhaust ventilators designed to evacuate hot air from attics. Each vent permits the passage of 1000 to 1600 c.f.m. Thermostat and/or humidistat controlled. **MasterFlow™ PR or ERV Series** power roof ventilators, by GAF®.
2. Powered, gable mounted exhaust ventilators designed to evacuate hot air from attics. Each vent permits the passage of 1280 to 1600 c.f.m. Thermostat and/or humidistat controlled. **MasterFlow™ PG or EGV Series** power roof ventilators, by GAF®.

G Roof Louvers

1. Rooftop mounted, square-top designed, high-impact resin exhaust ventilator designed to evacuate hot air from attics. Each vent provides 60 sq in NFVA. **MasterFlow™ RT-65** Passive Roof Louver, by GAF®.
2. Rooftop mounted, slant-back designed, metal exhaust ventilator designed to evacuate hot air from attics. Each vent provides 60 sq in NFVA. **MasterFlow™ SSB 960A** Passive Roof Louver, by GAF®.
3. Rooftop mounted, slant-back designed, high-impact resin exhaust ventilator designed to evacuate hot air from attics. Each vent provides 65 sq in NFVA. **MasterFlow™ IR65** Passive Roof Louver, by GAF®.

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4. Rooftop mounted, low-profile square-top designed, high-impact resin exhaust ventilator designed to evacuate hot air from attics. Each vent provides 37 sq in NFVA. **MasterFlow™ IR-61** Passive Roof Louver, by GAF®.
 5. Rooftop mounted, square-top, slant-back, metal exhaust ventilator designed to evacuate hot air from attics. Each vent provides 50 sq in NFVA. **MasterFlow™ NSB50A** Passive Roof Louver, by GAF®.
 6. Rooftop mounted, square-top metal utility ventilator designed to evacuate hot air from attics, bathrooms, and kitchen ducts. Each vent provides 50 sq in NFVA. **MasterFlow™ RV50A** Metal Utility Vent, by GAF®.
- H Gable Louvers
1. Surfaced mounted, flush or recessed one piece integral construction in thermoformed plastic or aluminum. **Masterflow™ DA** Series or SL Series Gable Louver by GAF®.
 2. Circular surfaced mounted, one piece integral construction high-impact white plastic mini vent. **Masterflow™ RLSC** Series Circular Louver by GAF®.
- I Roof Turbines
1. Rooftop mounted, stainless dual bearing, high performance, aluminum rotary turbine exhaust vents. **MasterFlow™ AIC12 & AIC14** Rotary Turbine Vents by GAF®.
 2. Rooftop mounted, stainless dual bearing, high performance, galvanized rotary turbine exhaust vents. **MasterFlow™ GC12E** Rotary Turbine Vent by GAF®.
- J Whole House Fans **attic spaces greater than 1000sq.ft only**
1. Interior ceiling mounted belt drive deluxe house fan. Super quiet 1/3 hp permanent split capacitor motor, wall switch operated. **MasterFlow™ 30BWHFS** Belt Drive Deluxe Whole House Fan by GAF®.
 2. Interior ceiling mounted direct drive standard house fan. Super quiet 1/4 hp permanent split capacitor motor, chain switch operated. **MasterFlow™ WHFS24M** Direct Drive Standard Whole House Fan by GAF®.
 3. Interior ceiling mounted tandem whole house fan. 2 speed remote operated. **MasterFlow™ WHFTAN1** Tandem Whole House Fan by GAF®.

2.11 VENTILATION ACCESSORIES

A Chimney Cap

1. Stainless steel vented chimney cap. **MasterFlow™ CC1313SS** Safety Cap by GAF®.
2. Epoxy powder finished vented chimney cap. **MasterFlow™ CC99, CC913 and CC1313** Safety Cap by GAF®.
3. Epoxy powder finished adjustable bracket mount vented chimney cap. **MasterFlow™ CC99, CC913 and CC1313** Safety Cap by GAF®.

B Foundation Vent

1. High Density Polyethylene constructed electric foundation vent provides up to 330 CFM/airflow. Independent laboratory approved. **Masterflow™ PFV1** Foundation Vent by GAF®.
2. High Density Polyethylene constructed automatic foundation vent. **Masterflow™ FVRABL** Foundation Vent by GAF®.
3. Die Cast aluminum positive open/closed damper foundation vent. **Masterflow™ 500** Foundation Vent by GAF®.

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4. Galvanized steel or aluminum high level ventilation foundation vent. **Masterflow™ BVSII** Foundation Vent by GAF®.

2.12 NAILS

- A Standard round wire, zinc-coated steel or aluminum; 10 to 12 gauge, smooth, barbed or deformed shank, with heads 3/8 inch (9mm) to 7/16 inch (11mm) in diameter. Length must be sufficient to penetrate into solid wood at least 3/4 inch (19mm) or through plywood or oriented strand board by at least 1/8 inch (3.18mm).

2.13 METAL FLASHING 24 gauge hot-dip galvanized steel sheet, complying with ASTM A 653/A 653M, G90/Z275.

- B 16-oz/sq ft (0.56mm) copper sheet, complying with ASTM B 370.
- C 0.032-inch (0.8mm) aluminum sheet, complying with ASTM B 209.

PART III EXECUTION

3.01 EXAMINATION

- A Do not begin installation until the roof deck has been properly prepared.
- B If roof deck preparation is the responsibility of another installer, notify the architect or building owner of unsatisfactory preparation before proceeding.

3.02 PREPARATION Remove all existing roofing down to the roof deck.

- B Verify that the deck is dry, sound, clean and smooth. It shall be free of any depressions, waves, and projections.
- C Cover with sheet metal, all holes over 1 inch (25mm) in diameter, cracks over 1/2 inch (12mm) in width, loose knots and excessively resinous areas.
- D Replace damaged deck with new materials.
- E Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

3.03 PREPARATION OF SUBSTRATE Clean deck surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

- B At areas that receive eaves protection membrane, fill knotholes and cracks with latex filler.
- C Install crickets on the upslope side of all chimneys in the north, any chimney wider than 24" (610mm), and on all roofs steeper than 6/12.

3.04 PREPARATION Verify that the deck is structurally sound and free of deteriorated decking. All deteriorated decking shall be removed and replaced with new materials.

- B Verify that the existing shingles are dry, sound, clean and smooth. All curled, buckled or loose tabs shall be nailed down or removed.
- C Clean shingle surfaces thoroughly prior to installation of eaves protection membrane and underlayment.

3.05 SUBSTRATE INSTALLATION

- A The structural roof deck shown in the plans shall be smooth and level and free of water or debris before the nail base insulation is installed. Apply vapor retarder if required.

NOTE: GAF recommends that the designer carefully considers the need for a vapor/air retarder.

- B Installation shall follow the GAF written installation instructions.
- C Fasten with ThermaCal® Fasteners to the supporting roof deck shown in the plans.

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- D Protect nail base insulation work from exposure to moisture damage and deterioration, primarily by prompt installation of the roofing, sheet metal and waterproofing work.

3.06 INSTALLATION OF UNDERLAYMENTS General:

- 1. Install using methods recommended by GAF®, in accordance with local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

B Eaves:

- 1. Install eaves edge metal flashing tight with fascia boards; lap joints 2 inches (51mm) and seal with plastic cement or high quality urethane sealant; nail at the top of the flange.
- 2. In the north, and on all roofs between 2/12 and 4/12 (low slopes) install GAF® leak barrier up the slope from eaves edge a full 36 inches (914mm) or to at least 24 inches (610 mm) beyond the interior "warm wall". Lap ends 6 inches (152mm) and bond.

C Valleys:

- 1. Install eaves protection membrane at least 36 (914mm) inches wide and centered on the valley. Lap ends 6 inches (152mm) and seal.
- 2. Where valleys are indicated to be "open valleys", install metal flashing over GAF® leak barrier before GAF® roof deck protection is installed; DO NOT nail through the flashing. Secure the flashing by nailing at 18 inches (457 mm) on center just beyond edge of flashing so that nail heads hold down the edge.

D Hips and Ridges:

- 1. Install GAF® leak barrier along entire lengths. If ridge vents are to be installed, position the GAF® leak barrier so that the ridge slots will not be covered.

E Roof Deck Protection:

- 1. Install one layer of GAF® roof deck protection over the entire area not protected by GAF® leak barrier at the eaves or valley. Install sheets horizontally so water sheds and nail in place.
- 2. On roofs sloped at more than 4:12, lap horizontal edges at least 2 inches (51mm) and at least 2 inches (51mm) over eaves protection membrane.
- 3. On roofs sloped between 2:12 and 4:12, lap horizontal edges at least 19 inches (482 mm) and at least 19 inches (482mm) over eaves protection membrane.
- 4. Lap ends at least 4 inches (102 mm). Stagger end laps of each layer at least 36 inches (914 mm).
- 5. Lap GAF® roof deck protection over GAF® leak barrier in valley at least 6 inches (152mm).

F Deck-Armor™ Application

- 1. Deck-Armor shall be installed over a clean, dry deck.
- 2. Install Weather Watch® or StormGuard® Leak Barrier at eaves, valleys, rakes, skylights, dormers and other vulnerable leak areas.
- 3. Lay Deck-Armor™ over deck and overlap 3" (76mm) at side laps and 6" (152mm) at end laps.
- 4. For exposure to rain or snow, overlap 12" (305mm) at end laps.
- 5. For side and end laps: fasten Deck-Armor 12" (305mm) o.c. (6" (152mm)o.c. for high wind areas).

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6. For middle of the roll: fasten Deck-Armor 24" (610mm) o.c. (12" (305mm) o.c. for high wind areas).
7. For exposure to rail or snow, completely cover all side laps, end laps and fasteners with tape.
8. For long term exposure see complete Deck-Armor installation instructions for side lap detail.
9. If roof may be exposed to high winds, apply tape over all fasteners at the center of the roll to prevent rain or snow from entering at the fasteners.
10. For slopes less than 2:12, a double application of Deck-Armor™ is required. See complete Deck-Armor installation instructions for more information.

G Penetrations:

1. Vent pipes: Install a 24 inch (610 mm) square piece of eaves protection membrane lapping over roof deck underlayment; seal tightly to pipe.
2. Vertical walls: Install eaves protection membrane extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
3. Skylights and roof hatches: Install eaves protection membrane from under the built-in counterflashing and 12 inches (305mm) on to the roof surface lapping over roof deck underlayment.
4. Chimneys: Install eaves protection membrane around entire chimney extending at least 6 inches (152mm) up the wall and 12 inches (305mm) on to the roof surface. Lap the membrane over the roof deck underlayment.
5. Rake Edges: Install metal edge flashing over eaves protection membrane and roof deck underlayment; set tight to rake boards; lap joints at least 2 inches (51mm) and seal with plastic cement; secure with nails.

3.07 INSTALLATION OF STARTER SHINGLES

A General:

1. Install in accordance with GAF®'s instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.
2. Refer to application instructions for the selected starter strip shingles.

B Placement and Nailing:

1. For maximum wind resistance along rakes & eaves, install any GAF® starter strip containing sealant or cement shingles to underlayment and each other in a 4" (102mm) width of asphalt plastic roof cement.
2. Place starter strip shingles 1/4" – 3/4" (6 – 19mm) over eave and rake edges to provide drip edge.
3. Nail approximately 1-1/2" – 3" (38 – 76mm) above the butt edge of the shingle.
4. Rake starter course should overlap eave edge starter strip at least 3" (76mm).

3.08 INSTALLATION OF SHINGLES

A General:

1. Install in accordance with GAF®'s instructions and local building codes. When local codes and application instructions are in conflict, the more stringent requirements shall take precedence.

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2. Minimize breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully (not by "breaking" over ridge or bundles), and by taking extra precautions in temperatures below 40 degrees F (4 degrees C).
 3. Handle carefully in hot weather to avoid scuffing the surfacing, or damaging the shingle edges.
- B Placement and Nailing:** Secure with 4, 5, or 6 nails per shingle per GAF®'s application instructions or local codes.
2. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
 3. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
 4. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
- C Placement and Nailing:** Beginning with the starter strip, trim shingles so that they "nest" within the shingle located beneath it. This procedure will yield a first course that is typically 3 inch (76mm) to 4 inch (102mm) rather than a fully exposed shingle.
2. Laterally, offset the new shingles from the existing keyways, to avoid waves or depressions caused by excessive dips in the roofing materials.
 3. Using the bottom of the tab on existing shingles, align subsequent courses.
 4. *Note: DO NOT install standard sized shingles (5inch exposure) over metric (5 5/8 inch exposure) shingles, as it will overexpose the shingles and reveal the nails. Use standard alignment methods to assure proper shingle placement.
 5. Secure with 4, 5, or 6 nails per shingle per GAF®'s instructions or local codes.
 6. Placement of nails varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
 7. Nails must be driven flush with the shingle surface. Do not overdrive or under drive the nails.
 8. Shingle offset varies based on the type of shingle specified. Consult the application instructions for the specified shingle for details.
- D Valleys** Install valleys using the "open valley" method:
- a Snap diverging chalk lines on the metal flashing, starting at 3 inches (76mm) each side of top of valley, spreading at 1/8 inch per foot (9mm per meter) to the eaves.
 - b Run shingles to chalk line.
 - c Trim last shingle in each course to match the chalk line; do not trim shingles to less than 12 inches (305mm) wide.
 - d Apply a 2 inch (51mm) wide strip of plastic cement under ends of shingles, sealing them to the metal flashing.
2. Install valleys using the "closed cut valley" method:
- a Run the first course of shingles from the higher roof slope across the valley at least 12 inches (305mm).
 - b Run succeeding courses of shingles from the lower roof slope across the valley at least 12 inches (305mm) and nail not closer than 6 inches (152mm) to center of valley.

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- c Run shingles from the upper roof slope into the valley and trim 2 inches (51mm) from the center line.
- 3. Install valleys using "woven valley" method: Run shingles from both roof slopes at least 12 inches (305mm) across center of valley, lapping alternate sides in a woven pattern.
 - b DO NOT nail less than 6 inches (152mm) from the valley center line.

E Penetrations

- 1. All Penetrations are to be flashed according to GAF®, ARMA and NRCA application instructions and construction details.

F 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.

3.09 INSTALLATION OF ATTIC VENTILATION

A General

- 1. Ventilation must meet or exceed current F.H.A., H.U.D. and local code requirements.

B Ridge / Soffit ventilation

- 1. Install ridge vent along the entire length of ridges:
- 2. Cut continuous vent slots through the sheathing, stopping 6 inches (152mm) from each end of the ridge.
- 3. On roofs without ridge board, make a slot 1 inch (25mm) wide, on either side of the peak (2 inch (51mm) overall).
- 4. On roofs with ridge board, make two slots 1-3/4 inches (44.5mm) wide, one on each side of the peak (3 ½ inch (89mm) overall).
- 5. Install ridge vent material along the full length of the ridge, including uncut areas.
- 6. Butt ends of ridge vent material and join using roofing cement.
- 7. Install eaves vents in sufficient quantity to equal or exceed the ridge vent area.

C Roof and Gable Louvers:

- 1. Cut vent hole through sheathing as specified by the manufacturer for the type of vent to be installed.
- 2. Install a 24 inches (610mm) square of leak barrier, centered around the hole for roof louvers
- 3. Install according to manufacturers instructions for flashing vent penetrations
- 4. Install eave vents in sufficient quantity to equal or exceed the exhaust vent area, calculated as specified by manufacturer.

D Powered (& Solar Powered) Ventilators & Roof turbines:

- 1. Cut vent hole through sheathing as specified by the manufacturer for the type of vent to be installed.
- 2. On rooftop applications, install a 36 inches (914mm) square of leak barrier, centered around the hole
- 3. Install according to manufacturers instructions for flashing vent penetrations

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4. Install eave vents in sufficient quantity to equal or exceed the exhaust vent area, calculated as specified by manufacturer

E Hip Vents and Rooftop Vents

1. Install according to manufacturer's instructions.
2. Install vents in sufficient quantity to equal or exceed the exhaust vent area, calculated as specified by manufacturer.

F Whole House Fans

1. Install at desired locations in ceiling below attic space per manufacturer recommended location and application instructions.

3.10 INSTALLATION OF VENTILATION ACCESSORIES

A Chimney Caps

1. Install chimney caps to manufacturer recommendations

B Foundation Vents

1. Install foundation vents per manufacturer recommendations and applications.

3.11 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