SECTION 07 51 00

BUILT-UP ASPHALT ROOFING

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\*\* NOTE TO SPECIFIER \*\* GAF, Commercial Roofing Products; conventional Built-Up Asphalt Roofing (BUR)
 .
 This section is based on the products of GAF, Commercial Roofing Products, which is located at:

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Parsippany, NJ 07054
 Toll Free Tel: (800) ROOF-411
 Tel: (973) 628-3000
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 Email: SBenoit@gaf.com
 Web: http:// [www.gaf.com](http://www.gaf.com)
 [ [Click Here](http://www.arcat.com/arcatcos/cos32/arc32667.cfm) ] for additional information.

Founded in 1886, GAF is one of the oldest manufacturers of commercial and residential roofing materials in the United States and its proud tradition of innovation and excellence has made it one of the most respected.

GAF manufactures and supplies a complete line of products for the asphaltic roofing systems most commonly used in commercial applications: Conventional built-up roofing (BUR), modified bitumen roofing, GAF composite roof systems that combine select BUR and modified bitumen materials into a multi-ply composite construction and single ply roofing. Each system offers specific advantages in terms of economy, strength, construction, fire resistance and overall durability.

See our SpecWizard: [Click Here](http://www.arcat.com/specwizard/07510gaf/index.htm)

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Asphaltic built-up roofing.
		2. Insulation.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 06 10 00: Rough Carpentry: Roof blocking installation and requirements.
		2. Section 07 62 00: Sheet Metal Flashing and Trim: Metal flashing and counter flashing installation and requirements.
		3. Section 22 30 00: Plumbing Specialties: roof drains, scuppers, gutters and downspout installation and requirements.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. Factory Mutual (FM Global) - Approval Guide.
			1. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
		2. Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TGFU R1306).
		3. American Society for Testing and Materials (ASTM) - Annual Book of ASTM Standards.
			1. ASTM C 208 - Standard Specification for Cellulosic Fiber Insulating Board.
			2. ASTM C 728 - Standard Specification for Perlite Thermal Insulation Board.
			3. ASTM C 1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
			4. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing and Waterproofing.
			5. ASTM D 312 - Standard Specification for Asphalt Used in Roofing.
			6. ASTM D 1863 - Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
			7. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
			8. ASTM D 3672 - Specification for Venting Asphalt-Saturated and Coated Inorganic Felt Base Sheet Used in Roofing.
			9. ASTM D 3909 - Standard Specification for Asphalt Roll Roofing (Glass Felt) Surfaced With Mineral Granules.
			10. ASTM D 4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
			11. ASTM D 4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
			12. ASTM D 4897 - Standard Specification for Asphalt-Coated Glass-Fiber Venting Base Sheet Used in Roofing.
			13. ASTM D 6163 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
			14. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
			15. ASTM D 6222 - Standard Specification for Atactic Polypropylene (APP) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
		4. Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.
		5. Asphalt Roofing Manufacturers Association (ARMA).
		6. National Roofing Contractors Association (NRCA).
		7. American Society of Civil Engineers (ASCE).
			1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
	1. DEFINITIONS
		1. 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.
	2. PERFORMANCE REQUIREMENTS
		1. Provide an installed roofing membrane and base flashing system that does not permit the passage of water and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.
		2. GAF shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.
	3. SUBMITTALS
		1. Submit under provisions of Section 01 30 00.
		2. [ [Product Data](http://www.arcat.com/arcatcos/cos32/arc32667.cfm) ]: Provide [ [Product Data](http://www.arcat.com/arcatcos/cos32/arc32667.cfm) ] sheets for each type of product indicated in this section.
		3. Shop Drawings: Provide manufacturers standard details and approved shop drawings for the roof system specified.
		4. Samples: Provide samples of insulations, fasteners, membrane materials and accessories for verification of quality.
	4. QUALITY ASSURANCE
		1. Manufacturer Qualifications: GAF shall provide a roofing system that meets or exceeds all criteria listed in this section.
		2. Installer Qualifications:

\*\* NOTE TO SPECIFIER \*\* List minimum installer classification.

* + - 1. Installer shall be classified as a Master Select Contractor as defined and certified by GAF.
			2. Installer shall be classified as a Master Contractor as defined and certified by GAF.
			3. Installer shall be classified as an Approved Contractor as defined and certified by GAF.
		1. Source Limitations: Components listed shall be provided by a single manufacturer or approved by the primary roofing manufacturer.

\*\* NOTE TO SPECIFIER \*\* Only Diamond Pledge system. Delete if not required.

* + 1. Final Inspection: Manufacturer's representative shall provide a comprehensive final inspection after completion of the roof system. All application errors shall be addressed and final punch list completed.
	1. PRE-INSTALLATION CONFERENCE
		1. Prior to scheduled commencement of the roofing installation and associated work, conduct a meeting at the project site with the installer, architect, owner, GAF representative and any other persons directly involved with the performance of the work. The installer shall record conference discussions to include decisions, agreements and open issues and furnish copies of recorded discussions to each attending party. The primary purpose of the meeting is to review foreseeable methods and procedures related to roofing work.
	2. REGULATORY REQUIREMENTS
		1. Work shall be performed in a safe, professional manner, conforming to all federal, state and local codes.
		2. Exterior Fire Test Exposure: Provide a roofing system achieving a UL Class rating for roof slopes indicated.

\*\* NOTE TO SPECIFIER \*\* Delete roof class rating not required.

* + - 1. UL Class A rating.
			2. UL Class B rating.
			3. UL Class C rating.
		1. Windstorm Classification: Provide a roofing system which will achieve the required uplift resistance as calculated in accordance with ASCE 7-05 or as listed in the current FM Approval Guide. Corners and perimeter areas shall be calculated in accordance with ASCE 7-05.

\*\* NOTE TO SPECIFIER \*\* Delete roof wind uplift rating not required.

* + - 1. 60 psf of uplift resistance
			2. 75 psf of uplift resistance
			3. 90 psf of uplift resistance
			4. 105 psf of uplift resistance
	1. DELIVERY, STORAGE AND HANDLING
		1. Deliver roofing materials to the site in original containers, with factory seals intact. Products shall carry either a GAF or GAFMC label.
		2. Store pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.
		3. Store roll goods on end on pallets in a clean, dry, protected area. Take care to prevent damage to roll ends or edges. Do not double stack modified bitumen products.
		4. Do not expose materials to moisture in any form before, during or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.
		5. Remove manufacturer supplied plastic covers from materials provided with such. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each work day. Do not remove any protective tarpaulins until immediately before the material will be installed.
		6. Materials shall be stored above 55 degrees F (12.6 degrees C) a minimum of 24 hours prior to application.
		7. Store and dispose of solvent-based materials and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
	2. PROJECT CONDITIONS
		1. Weather:
			1. Proceed with roofing only when existing and forecasted weather conditions permit.
			2. Ambient temperatures shall be above 45 degrees F (7.2 degrees C) when applying hot asphalt or water based adhesives.
	3. WARRANTY

\*\* NOTE TO SPECIFIER \*\* Delete warranty not required.

* + 1. Provide manufacturer's standard Diamond Pledge Guarantee with single source coverage and no monetary limitation where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.

\*\* NOTE TO SPECIFIER \*\* Delete warranty years not required.

* + - 1. Duration: Five (5) years from the date of completion.
			2. Duration: Ten (10) years from the date of completion.
			3. Duration: Twelve (12) years from the date of completion.
			4. Duration: Fifteen (15) years from the date of completion.
			5. Duration: Twenty (20) years from the date of completion.
		1. Provide manufacturer's standard Diamond Pledge Guarantee with the WELL ROOF Advantage. Provides single source coverage and no monetary limitation, where the manufacturer agrees to repair or replace components in the roofing system, which cause a leak due to a failure in materials or workmanship.

\*\* NOTE TO SPECIFIER \*\* Delete warranty years not required.

* + - 1. Duration: Five (5) years from the date of completion.
			2. Duration: Ten (10) years from the date of completion.
			3. Duration: Twelve (12) years from the date of completion.
			4. Duration: Fifteen (15) years from the date of completion.
			5. Duration: Twenty (20) years from the date of completion.
			6. Duration: Twenty-five (25) years from the date of completion.
			7. Extension: GAF also guarantees to the original or first subsequent owner that coverage shall be extended by 25 percent of the original guarantee length, provided that the roof in inspected and maintained in accordance with the MAINTAINENCE section of this specification.
		1. Provide manufacturer's standard System Pledge Guarantee with single source coverage and a monetary limitation of one (1) dollar per square foot where the manufacturer agrees to repair or replace components in the roof system, which cause a leak due to failure in materials or workmanship.

\*\* NOTE TO SPECIFIER \*\* Delete warranty years not required.

* + - 1. Duration: Five (5) years from the date of completion.
			2. Duration: Ten (10) years from the date of completion.
			3. Duration: Twelve (12) years from the date of completion.
			4. Duration: Fifteen (15) years from the date of completion.
			5. Duration: Twenty (20) years from the date of completion.
		1. Provide Manufacturers standard Labor and Material Guarantee where the manufacturer agrees to repair or replace the portion of the roofing materials, which have resulted in a leak due to a manufacturing defect or defects caused by ordinary wear and tear.

\*\* NOTE TO SPECIFIER \*\* Delete warranty years not required.

* + - 1. Duration: Five (5) years from the date of completion.
			2. Duration: Ten (10) years from the date of completion.
			3. Duration: Twelve (12) years from the date of completion.
			4. Duration: Fifteen (15) years from the date of completion.
			5. Duration: Twenty (20) years from the date of completion.
		1. Provide Manufacturers standard prorated material warranty where the manufacturer agrees to repair or replace to portion of the roofing materials that have resulted in a leak due to a manufacturing defect or defects caused by ordinary wear and tear.
			1. Duration: Ten (10) years.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: GAF, Commercial Roofing Products, which is located at: 1 Campus Dr.; Parsippany, NJ 07054; Toll Free Tel: 800-ROOF-411; Tel: 973-628-3000; Fax: 973-628-3451; Email: SBenoit@gaf.com; Web: [www.gaf.com](http://www.gaf.com)

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

\*\* NOTE TO SPECIFIER \*\* Delete insulation if not required.

* 1. INSULATION

\*\* NOTE TO SPECIFIER \*\* Delete insulation types not required.

* + 1. Rigid polyisocyanurate board, with a strong white or black fibrous glass facer conforming to or exceeding the requirements of ASTM C 1289 / FS HH-I-1972, EnergyGuard Polyiso, with the following characteristics:

\*\* NOTE TO SPECIFIER \*\* Provide project information.

* + - 1. Board Thickness:
			2. Thermal Resistance (LTTR value):
		1. Rigid polyisocyanurate foam insulation with 1/2 inch (13 mm) perlite roof insulation laminated to one side and a strong fibrous glass facer on the other; conforms to or exceeds the requirements of ASTM C 1289 / FS HH-I, EnergyGuard Composite, with the following characteristics:

\*\* NOTE TO SPECIFIER \*\* Provide project information.

* + - 1. Board Thickness:
			2. Thermal Resistance (LTTR value):
		1. Rigid polyisocyanurate foam insulation with 1/2 inch (13 mm) cellulose fiber board laminated to one side and a strong fibrous glass facer on the other; conforms to or exceeds the requirements of ASTM C 1289 / FS HH-I, EnergyGuard Composite, with the following characteristics:

\*\* NOTE TO SPECIFIER \*\* Provide project information.

* + - 1. Board Thickness:
			2. Thermal Resistance (LTTR value):
		1. Expanded perlite mineral aggregate board conforming to or exceeding the requirements of FS HH-I-529b, ANSI/ASTM C 728. EnergyGuard Perlite, with the following characteristics:
			1. Board Density: 9 lb/cf (144 kg/cm) minimum.

\*\* NOTE TO SPECIFIER \*\* Provide project information.

* + - 1. Board Thickness:
			2. Thermal Resistance (R value):
		1. Overlayment board made of cellulose fiber conforming to or exceeding the requirements of FS LLL-I-535, Class C, ANSI/ASTM C 208. EnergyGuard Fiberboard, with the following characteristics:
			1. Board Thickness: 1/2 inch (13 mm).
			2. Thermal Resistance (R value) of: 1.32 (2.5C/W).

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. ROOF BOARD

\*\* NOTE TO SPECIFIER \*\* Delete roof board types not required.

* + 1. Underlayment or overlayment board with a water-resistant and silicone treated gypsum core with glass fiber facers embedded on both sides and pre-primed on one side. GP Dens-Deck Prime Roof Board, distributed by GAF.
			1. Board Thickness:
			2. Thermal Resistance (R value) of:
		2. Underlayment or overlayment board with a water-resistant and silicone treated gypsum core with glass fiber facers embedded on both sides. GP Dens-Deck Roof Board, distributed by GAF.
			1. Board Thickness:
			2. Thermal Resistance (R value) of:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* 1. INSULATION ACCESSORlES
		1. Cant Strip: Factory fabricated rigid perlite strip cut at angles to provide a true 45 degree angle between horizontal and vertical surfaces, EnergyGuard Perlite Cant Strip, by GAF.
		2. Tapered Edge Strip: Factory fabricated rigid perlite strip cut at angles to provide a smooth transition between differences in elevation. EnergyGuard Tapered Edge Strip, by GAF.
	2. SHEET MATERIALS

\*\* NOTE TO SPECIFIER \*\* Delete membrane materials not required.

* + 1. Dry Sheathing Paper: Red Rosin Paper, unsaturated.

\*\* NOTE TO SPECIFIER \*\* Delete base sheets not required.

* + 1. Asphalt coated glass fiber reinforced base sheet: Conforms to or exceeds requirements of ASTM D 4601, Type II, UL Type G2 BUR. Each roll contains three (3) squares (320 sf) of material, approximately 39.4 inches by 97.5 feet (1000 mm by 29700 mm); 75 lb (34.1 kg), GAFGLAS #75 base sheet.
		2. Heavy duty, asphalt coated, glass fiber reinforced base sheet: Conforms to or exceeds requirements of ASTM D 4601, Type II, UL Type G2 BUR. Each roll contains two (2) squares (214 sf) of material, approximately 39.4 inches by 65.2 feet (1000 mm by 19900 mm); 75 lbs. (34.1 kg), GAFGLAS #80 ULTIMA base sheet.
		3. Asphalt coated, glass fiber reinforced, mechanically fastened venting base sheet: Conforms to or exceeds requirements of ASTM D 3672 Type II and ASTM D 4897, Type II and UL Type G2 BUR. Each roll contains one square of material, approximately 39.4 inches by 32.6 feet (1000 mm by 9900 mm); 69 lb (31 kg), GAFGLAS STRATAVENT Eliminator Nailable base sheet.
		4. Asphalt coated, glass fiber reinforced, asphalt applied venting base sheet, has 1/2 inch (13 mm) perforations, 3 in a row with groups spaced 3 inches (76 mm) apart on center: Conforms to or exceeds requirements of ASTM D 3672 Type II and ASTM D 4897, Type II and UL Type G2 BUR. Each roll contains one square of material, approximately 39.4 inches by 32.6 feet (1000 mm by 9900 mm); 60 lb (27.3 kg), GAFGLAS STRATAVENT Eliminator Perforated base sheet.

\*\* NOTE TO SPECIFIER \*\* Delete ply sheets not required.

* + 1. Asphalt coated glass fiber ply sheet, strong and lightweight. Conforms to or exceeds requirements of ASTM D 2178 Type IV and UL Type G1 BUR Each roll contains five (5) squares (530 sf) of material, approximately 39.4 inches by 161.8 feet (1000 mm by 49300 mm), 40 lb (18.2 kg), GAFGLAS Ply 4 ply sheet.
		2. Premium asphalt coated glass fiber ply sheet with flexible Design: Conforms to or exceeds requirements of ASTM D 2178 Type VI and UL Type G1 BUR. Each roll contains five (5) squares (530 sf) of material, approximately 39.4 inches by 161.8 feet (1m by 49.3 m), 44 lb (20 kg), GAFGLAS FlexPly 6 ply sheet.

\*\* NOTE TO SPECIFIER \*\* Delete cap sheets not required.

* + 1. Asphalt coated mineral surfaced cap sheet for use as the finish ply in the application of hot applied built-up roofs. Complies with ASTM D 3909 Type III and UL Type G3 BUR. Each roll contains one square of material, approximately 39.4 inches by 32.6 feet (1000 mm by 9900 mm); 76 lb (34.6 kg), GAFGLAS Mineral Surfaced Cap Sheet.
			1. Color: to be selected by owner or architect from standard GAF selections.
		2. ENERGYSTAR rated, asphalt coated mineral surfaced cap sheet with elastomeric coating for use as the finish ply in the application of hot applied built-up roofs. Complies with ASTM D 3909 Type III and UL Type G3 BUR. Each roll contains one square of material, approximately 39.4 inches by 32.6 feet (1000 mm by 9900 mm); 76 lb (34.6 kg), GAFGLAS EnergyCap BUR Mineral Surfaced Cap Sheet.
	1. BITUMEN / ADHESIVE

\*\* NOTE TO SPECIFIER \*\* Delete products not required.

* + 1. Asphalt bitumen: ASTM D 312.

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Type I.
			2. Type II.
			3. Type III.
			4. Type IV.
		1. SEBS Asphalt Bitumen: ASTM D 312.

\*\* NOTE TO SPECIFIER \*\* Delete types not required.

* + - 1. Type III.
			2. Type IV.
		1. SBS Cement: ASTM D 4586, TOPCOAT Matrix 201 Premium SBS Flashing Cement, by GAF.
		2. SBS Cement: ASTM D 4586, TOPCOAT Matrix 202 SBS Flashing Cement, by GAF.
		3. Roof Cement: ASTM D 4586, TOPCOAT Matrix 203 Plastic Roof Cement, by GAF.
		4. Asphalt Primer: ASTM D 41 TOPCOAT Matrix 307 Premium Asphalt Primer, by GAF.
		5. Insulation Adhesive: Oly-Bond 500 distributed by GAF.

\*\* NOTE TO SPECIFIER \*\* It is the responsibility of those involved with the design of the building to attain indemnification for the attachment and integrity of the Insta-Stik Product. GAF assumes no responsibility for the Insta-Stik product or its performance within the system.

* + 1. Insulation Adhesive: Insta-Stik by Dow Chemical.
	1. FLASHING MATERlALS

\*\* NOTE TO SPECIFIER \*\* Delete flashing materials not required.

* + 1. Asphalt coated glass fiber reinforced base sheet: Conforms to or exceeds requirements of ASTM D 4601, Type II, UL Type G2 BUR. Each roll contains three (3) squares (320 sf) of material, approximately 39.4 inches by 97.5 feet (1000 mm by 29700 mm); 75 lb (34.1 kg), GAFGLAS #75 base sheet.
		2. Heavy duty, asphalt coated, glass fiber reinforced base sheet: Conforms to or exceeds requirements of ASTM D 4601, Type II, UL Type G2 BUR. Each roll contains two (2) squares (214 sf) of material, approximately 39.4 inches by 65.2 feet (1000 mm by 19900 mm); 75 lbs. (34.1 kg), GAFGLAS #80 ULTIMA base sheet.
		3. Asphalt coated mineral surfaced cap sheet for use as the finish ply in the application of hot applied built-up roofs. Complies with ASTM D 3909 Type III and UL Type G3 BUR. Each roll contains one square of material, approximately 39.4 inches by 32.6 feet (1000 mm by 9900 mm); 76 lb (34.6 kg), GAFGLAS Mineral Surfaced Cap Sheet.
			1. Color: to be selected by owner or architect from standard GAF selections.
		4. ENERGYSTAR rated, asphalt coated mineral surfaced cap sheet with elastomeric coating for use as the finish ply in the application of hot applied built-up roofs. Complies with ASTM D 3909 Type III and UL Type G3 BUR. Each roll contains one square of material, approximately 39.4 inches by 32.6 feet (1000 mm by 9900 mm); 76 lb (34.6 kg), GAFGLAS EnergyCap BUR Mineral Surfaced Cap Sheet.
		5. Smooth surfaced modified bitumen membrane with a non-woven fiberglass reinforcing mat coated with flexible, SBS polymer-modified asphalt. Each roll contains one and one-half squares of material, approximately 39.4 inches by 49.1 feet (1 m by 14 m); 95 lb (43 kg), Ruberoid 20 SBS membrane.
		6. Granule-surfaced modified bitumen membrane with a non-woven polyester reinforcing mat coated with flexible, SBS polymer-modified asphalt. Conforms to or exceeds requirements of ASTM D 6164 Type I Grade G. Each roll contains one square of material, approximately 39.4 inches by 33.6 feet (1 mm by 10.3 m), 102 lb (46.4 kg), Ruberoid Mop Granule SBS membrane.
		7. Fire retardant modified bitumen membrane with a non-woven polyester reinforcing mat coated with flexible, SBS polymer-modified asphalt. Conforms to or exceeds the requirements of ASTM D 6164 Type I Grade G. Each roll contains one (1) square of material, approximately 39.4 inches by 33.6 feet (1 m by 10.3 m), 103 lb (46.7 kg), Ruberoid Mop 170 FR SBS membrane.
		8. Fire-retardant, granule-surfaced modified bitumen membrane with a non-woven polyester reinforcing mat coated with flexible, SBS polymer-modified asphalt. Conforms to or exceeds requirements of ASTM D 6164 Type II Grade G. Each roll contains one square of material, approximately 39.4 inches by 33.6 feet (1 m by 10.3 m), 102 lb (46.4 kg), Ruberoid Mop FR SBS membrane.
		9. Granule surfaced modified bitumen membrane with a non-woven polyester reinforcing mat coated with APP polymer-modified asphalt. Conforms to or exceeds requirements of ASTM D 6222 Type I Grade G. Each roll contains one square of material, approximately 39.4 inches by 32.9 feet (1000 mm by 10000 m), 102 lb (46.4 kg) Ruberoid Torch Granule APP membrane.
		10. Fire retardant, granule surfaced modified bitumen membrane with a non-woven polyester reinforcing mat coated with APP polymer-modified asphalt. Conforms to or exceeds the requirements of ASTM D 6222 Type II Grade G. Each roll contains 3/4 square of material, approximately 39.4 inches by 24.6 feet (1 m by 7 m), 90 lb (40.9 kg) Ruberoid Torch FR APP membrane.
		11. Fire retardant modified bitumen membrane containing a high tensile woven fiberglass scrim, coated with an SBS polymer-modified asphalt and covered with a protective foil facing with built-in moisture control channels. Conforms to or exceeds requirements of ASTM D 6298. Each roll contains one square of material, approximately 39.75 inches by 33.4 feet (1 m by 10.1 m); 101 lb (45.8 kg), Ruberoid ULTRACLAD SBS membrane.

\*\* NOTE TO SPECIFIER \*\* Delete surfacing materials not required.

* 1. SURFACING
		1. TOPCOAT Matrix 303 Premium Fibered Aluminum Roof Coating, conforming to or exceeding, ASTM D 2824, Type III, heavy bodied with special reinforcing fibers.
		2. TOPCOAT Matrix 304 Non-Fibered Aluminum Roof Coating, conforming to or exceeding, ASTM D 2824, Type I, premium, high aluminum content.
		3. TOPCOAT Matrix 305 Fibered Asphalt Emulsion - Conforming to or exceeding ASTM D 1227, Type IV.
		4. TOPCOAT Matrix 306 Non-Fibered Asphalt Emulsion - Conforming to or exceeding ASTM D 1227, Type III.
		5. Special asphalt roofing bitumen conforming to or exceeding ASTM D 312, Type I.
		6. Mineral aggregate used in built up roofing, ASTM D 1863, 400 lb per square (20 kg/sm). Fines, dirt or organic materials are not acceptable.
	2. ACCESSORlES

\*\* NOTE TO SPECIFIER \*\* Delete accessories not required.

* + 1. Mechanical Fasteners:
			1. DrillTec Standard Screws: Alloy steel fastener with CR-10 coating with a .220 inch (5.5 mm) diameter thread: Factory Mutual Standard 4470 Approved, #3 Phillips truss head or hex head.
			2. DrillTec ASAP 3P Fastener: Assembled screw and 3 inches (76 mm) locking plastic plate. Alloy steel fastener with CR-10 coating with a .220 inch (5.5 mm) diameter thread: Factory Mutual Standard 4470 Approved, #3 Phillips truss head.
			3. DrillTec ASAP 3S Fastener: Assembled screw and 3 inches (76 mm) steel plate. Alloy steel fastener with CR-10 coating with a .220 inch (5.5 mm) diameter thread: Factory Mutual Standard 4470 Approved, #3 Phillips truss head.
			4. DrillTec HD Screws: Heavy duty gauge alloy steel fastener with CR-10 coating with a .245 inch (6.2 mm) diameter thread: Factory Mutual Standard 4470 Approved, #3 Phillips truss head for use on heavy steel decks.
			5. DrillTec NTB-1HWO Fastener: A large diameter glass fiber filled nylon auger with a 1 inch (25 mm) head. Major thread diameter of .750 inch (19 mm). To be used with 3 inches (76 mm) Steel Round Plate or a 2 inches (51 mm) steel plate with barbs.
			6. DRILLTEC NTB-1HWW Fastener: A large diameter glass filled nylon auger with a 1 inch (25 mm) head and with locking wire barbs. Major thread diameter of .750 inch (19 mm). To be used with 3 inches (76 mm) Steel Round Plate or a 2 inches (51 mm) steel plate with barbs.
			7. DRILLTEC CD-10 Fastener: Hammer-in, non-threaded fastener designed to secure insulation to structural concrete. Alloy steel fastener with a CR-10 coating and a .270 /.277 inch (6.8/7.0 mm) split diameter.
			8. DRILLTEC Lite-Deck Fastener: A large diameter reinforced nylon screw with a #3 square drive flat head. Tread diameter of .375 inch (9.5 mm) and shank diameter of .312 inch (7.9 mm). Uses a 3 inches (76 mm) Metal Round Plate fastening system.
			9. DRILLTEC CR Base Sheet Fastener: G-90 galvanized, CR-10 Corrosion resistant coating with 1.125 inch (29 mm) by 1 inch (25 mm) head and 1.75 inches (44 mm) leg length. Uses 2.75 inches (70 mm) diameter Galvalume steel roof disc.
			10. DRILLTEC CR 1.2 Base Sheet Fastener: G-90 galvanized, CR-10 Corrosion resistant coating with 1.125 inch (29 mm) by 1 inch (25 mm) head and 1.2 inches (30 mm) leg length. Uses 2.75 inches (70 mm) diameter Galvalume steel roof disc.
			11. DRILLTEC 2 inches Galvalume Plate: Galvalume, 2 inches (5.1 cm) diameter, center hole .25 inch (3 mm), for use with Standard, Heavy Duty, CD-10, Fluted Nail or Toggle Bolt.
			12. DRILLTEC 3 inches (76 mm) Galvalume Plate: Galvalume, 3 inches (76 mm) diameter, center hole .25 inch (3 mm), for use with Standard, Heavy Duty, CD-10, Fluted Nail or Toggle Bolt.
			13. DRILLTEC 2 inches (51 mm) NTB Plate: Galvalume plate with extra wide diameter and steel barbs, designed specifically for NTB Fastener, DRILL-TEC Fasteners.
			14. DRILLTEC 3 inches (76 mm) NTB Plate: Galvalume, plate with extra wide diameter, designed specifically for NTB Fastener.
			15. DRILLTEC Lite-Deck Plate: Galvalume, plate with extra wide diameter designed specifically for Lite-Deck Fastener.
			16. DRILLTEC 3 inches (51 mm) Locking Plastic Plates: Made of high strength polyolefin. The screw head locks under the lip into the slotted configuration to prevent screw pop-up.
			17. DRILLTEC Base Sheet Plate: 2.75 inches (70 mm) Disk for use with CR Base Sheet Fasteners.
			18. DRILL TEC Locking Impact Nail: Factory Assembled, G-90 Galvalume Coated fastener designed to install base sheets or insulation to gypsum or cementitious wood fiber. 1.8 inches (46 mm) to 4.8 inches (122 mm) lengths available with a 2.7 inches (69 mm) diameter plate.
			19. Threaded Cap Nail: Annular-threaded electro-galvanized with yellow di-chromate coating, with 1 inch (25 mm) round or square cap, as manufactured by the Simplex Nail Corporation.
			20. Two-Piece Tube Nail: 1 inch (25 mm) diameter cap; when the nail is driven down through the tube of first part that was installed, the nail hooks up to provide backout resistance), as manufactured by The Simplex Corporation.
			21. Nail-Tite Type-R Fasteners: Self-locking one-piece fastener for securing base ply when roofing over existing poured gypsum roof decks. Shank: 1 inch (25 mm) tapered cone precision formed from corrosion resistant galvanized (G-90) steel. Cap: 1-1/4 inches (32 mm) round cap formed from corrosion resistant Galvalume (AZ-55) steel, reinforced to resist cupping during driving. The shank is securely wedged to cap forming rigid one-piece fastener, by E. S. Products.
			22. Tape and N12 BAB or N12 FAB Staples, by Senco.
		2. One Way Vents:
			1. Pressure relief device consisting of a one-piece spun aluminum vent pre-flashed with modified bitumen. Internally, the vent contains a neoprene valve that allows air pressure and moisture vapor to escape out of the system without allowing additional air and moisture vapor to return. The One Way MVent, by Mweld.

\*\* NOTE TO SPECIFIER \*\* Not for use over active pipes that emit steam or excessive moisture vapor, condensation may occur. Not for use over boiler or heater/furnace vent pipes.

* + 1. Standard Vents:
			1. A spun aluminum vent, pre-flashed with modified bitumen designed to waterproof soil pipes and roofing protrusions. The Standard M-Vent, by GAF.
		2. Adjustable Vents:
			1. A two-piece roof-flashing unit consisting of a pre-flashed spun aluminum base and a flexible upper boot, allowing for waterproofing of tall or awkward roof protrusions. The Adjustable M-Vent, by GAF.
		3. Plumbing Vents:
			1. A pre-flashed with modified bitumen membrane and is designed to waterproof vent pipes. It can be used as a pipe cover to replace finger and cap flashing on standard vent pipe details. The Pre-Flashed Plumbing Vent, by GAF.
		4. Drains:
			1. A spun aluminum (or copper) roof drain with gravel guard, strainer cap and waterproofing plumbing seal attached. Pre-flashed with modified bitumen and available in full and insert sizes to accommodate new construction and retrofit applications. The M-Drain, by GAF.
			2. A Pre-flashed metal through-wall roof drain designed for easy installation to aid in quick lateral removal of water. The M-Scupper, by GAF.
		5. Sealant Pans:
			1. A structural urethane outer shell, bonded to the roof surface, filled with a urethane rubber sealant. The urethane sealant conforms to the shape of any roof penetration through a roof surface to protect the roof system from moisture. The M-Curb and M-Thane, by GAF.
		6. Expansion Joint Covers:
			1. Factory fabricated assemblies used to accommodate three-dimensional joints in a roof structure. Heavy reinforced flexible cover with a flexible flame retardant foam bellows for support. Nailing flanges conform to curb irregularities. The Metalastic Expansion Joint Cover, by GAF.
		7. Gravel Guard:
			1. Three-piece fascia system with roof flange design that creates water and wind proof seals at the building perimeter. The Gravel Guard MB, by GAF.
1. EXECUTION
	1. EXAMINATION
		1. Verify that the surfaces and site conditions are ready to receive work.
		2. Verify that the deck is supported and secured.
		3. Verify that the deck is clean and smooth, free of depressions, waves or projections and properly sloped to drains, valleys, eaves, scuppers or gutters.
		4. Verify that the deck surfaces are dry and free of ice or snow.
		5. Verify that all roof openings or penetrations through the roof are solidly set and that all flashings are tapered.
	2. SUBSTRATE PREPARATION

\*\* NOTE TO SPECIFIER \*\* Delete roof deck not required.

* + 1. Steel Deck:

\*\* NOTE TO SPECIFIER \*\* FM requirements may supersede those set forth in this section. Consult the current FM Guide for more information.

* + - 1. Metal decks shall be a minimum uncoated thickness of 22 gauge (0.8 mm) and shall have a G-90 galvanized finish on all panels.
			2. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.

\*\* NOTE TO SPECIFIER \*\* Delete if re-roofing not required.

* + - 1. When re-roofing over steel decks, surface corrosion shall be removed and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened and irreparable or otherwise defective decking shall be replaced.
		1. Structural Concrete Deck:
			1. Minimum deck thickness for structural concrete is 4 inches (102 mm).

\*\* NOTE TO SPECIFIER \*\* Concrete decks that are poured over non-vented metal decks or pans that remain in place may trap moisture in the deck beneath the roof system and are not acceptable.

* + - 1. Only poured in place concrete decks that provide bottom side drying are acceptable.
			2. The roof deck shall be properly cured prior to application of the roofing system. Curing agents shall be checked for compatibility with roofing materials. Prior to the installation of the roof assemblies, evaluation of the surface moisture and deck's dryness by the use of ASTM D-4263 or hot bitumen test procedures shall be conducted.
			3. The deck shall be smooth, level and cannot be wet or frozen.
			4. Treat cracks greater than 1/8 inch (3 mm) in width in accordance with the deck manufacturer's recommendations.
			5. Sumps for the roof drains shall be provided in the casting of the deck.
			6. When insulation or roofing is to be adhered with hot asphalt, prime the deck with asphalt/concrete primer, ASTM D 41 at the rate of one gallon per 100 square feet (0.4 l/sm). Allow the primer to dry prior to the application of the roofing system.

\*\* NOTE TO SPECIFIER \*\* Delete if re-roofing not required.

* + - 1. With retrofit roof applications, it is required that the deck be inspected for defects. Defects are to be corrected per the deck manufacturer's recommendations prior to the roofing application.
		1. Wood Deck (Plank / Heavy Timber):

\*\* NOTE TO SPECIFIER \*\* Tongue and groove or shiplap lumber is preferred to square edge material since subsequent shrinkage or warping of square edge planks may cause ridging of the roof system above adjacent boards.

* + - 1. Wood boards shall be at least 1 inch (25 mm) nominal thickness and have a nominal width of 4 feet-6 inches (1372 mm).
			2. All boards shall have a bearing on rafters at each end and be securely nailed.
			3. Lumber shall be kiln dried.
			4. Preservatives or fire retardants used to treat decking shall be compatible with roofing materials.
			5. Decking shall be kept dry and roofed promptly after installation.
			6. Knotholes or large cracks in excess of 1/4 inch (6 mm) shall be covered with securely nailed sheet metal.

\*\* NOTE TO SPECIFIER \*\* Delete if re-roofing not required.

* + - 1. In all retrofit roof applications, it is required that deck be inspected for defects. Any defects are to be corrected per the deck manufacturer's recommendations and standards of the APA/Engineered Wood Association prior to new roof application.
			2. Light metal wall ties or other structural metal exposed on top of the wood deck shall be covered with one ply of a heavy roofing sheet, such as Stratavent Eliminator Nailable Base Sheet, extending 2 inches to 6 inches (51 mm to 152 mm) beyond the metal in all directions. Nail in place before applying the base ply.
			3. Attach an acceptable base sheet through flat metal caps or use nails with attached 1 inch (25 mm) square or round metal caps that have a minimum withdrawal resistance of 40 pounds each (178 N).
			4. Tape and staple fastening systems may be used on wood decks when they comply with local building codes.
		1. Plywood Deck:
			1. Plywood sheathing shall be exterior grade, minimum 4 ply and not less than 15/32 inch (12 mm) thick.
			2. Preservatives or fire retardants used to treat the decking shall be compatible with roofing materials.
			3. The deck shall be installed over joists that are spaced 24 inches (610 mm) o.c. or less.
			4. The deck shall be installed so that all four sides of each panel bear on and are secured to joist and cross blocking. "H" clips are not acceptable.
			5. Panels shall be installed with a 1/8 inch to 1/4 inch (3 mm to 6 mm) gap between panels and shall match vertically at joints to within 1/8 inch (3 mm).
			6. Decking shall be kept dry and roofed promptly after installation.
			7. Light metal wall ties or other structural metal exposed on top of the wood deck shall be covered with one ply of a heavy roofing sheet, such as Stratavent Eliminator Nailable Base Sheet, extending 2 inches to 6 inches (51 mm to 152 mm) beyond the metal in all directions. Nail in place before applying the base ply.
			8. Tape and staple fastening systems may be used on wood decks when they comply with local building codes.
			9. Attach an acceptable base sheet through flat metal caps or use nails with attached 1 inch (25 mm) square or round metal caps that have a minimum withdrawal resistance of 40 pounds each (178 N).
		2. Oriented Strand Board (OSB) Deck:
			1. Oriented Strand Board shall carry a Structural 1 rating when used as a decking material.
			2. Preservatives or fire retardants used to treat decking shall be compatible with roofing materials.
			3. The deck shall be installed over joists that are spaced 24 inches (610 mm) o.c. or less.
			4. The deck shall be installed so that all four sides of each panel bear on and are secured to joist and cross blocking; the APA/Engineered Wood Association (APA) recommendations. "H" clips are not acceptable.
			5. Panels shall be installed with a 1/8 inch to 1/4 inch (3 mm to 6 mm) gap between panels and shall match vertically at joints to within 1/8 inch (3mm).
			6. Decking shall be kept dry and roofed promptly after installation.
			7. Tape and staple fastening systems may be used on wood decks when they comply with local building codes.
			8. When light metal wall ties or other structural metal are exposed on top of the wood deck, cover them with a heavy ply of a roofing sheet, such as Stratavent Eliminator Nailable Base Sheet, extending 2 inches to 6 inches (51 mm to 152 mm) beyond the metal in all directions. Nail in place before applying the base ply.
			9. Attach an acceptable base sheet through flat metal caps or use nails with attached 1 inch (25 mm) square or round metal caps that have a minimum withdrawal resistance of 40 pounds each (178 N).
		3. Lightweight Insulating Concrete Deck

\*\* NOTE TO SPECIFIER \*\* Individual deck manufacturer's standards apply when their specifications exceed the minimum thickness, compressive strength or density requirements.

* + - 1. Lightweight insulating concrete decks are required to have a minimum thickness of 2 inches (51 mm), a minimum compressive strength of 125 psi (0.86 MPa) and a minimum density of 22 pcf (352 kg/sm).
			2. The lightweight insulating deck/fill shall be installed by an applicator approved by the deck manufacturer.
			3. The roof system shall be installed immediately following deck curing to prevent damage from exposure to precipitation. The deck manufacturer determines the minimum curing time and maximum exposure limitations.
			4. LWIC shall not be poured during rainy periods. Deck areas that have frozen before they have cured shall be removed and replaced. Decks which receive precipitation prior to installation of the roof membrane shall be checked for moisture content and dryness.
			5. Where the mean January temperature (Reference current ASHRAE Fundamentals Handbook) is below 40 degrees F (4.4 degrees C), lightweight insulating concrete decks shall be poured and roofed between April 1 and October 31. This type of deck is unacceptable in Alaska.
			6. Lightweight insulating concrete decks are acceptable only on slopes up to 1 inch per foot (83 mm/m).
			7. Do not attach insulation directly to lightweight concrete decks. Over old, dry decks, additional board insulation may be solidly mopped to an approved mechanically attached anchor sheet (base sheet).
		1. Cementitious Wood Fiber
			1. Decks shall be protected from the weather during storage and application; any wet or deformed decking shall be removed and replaced.
			2. Cementitious wood fiber decks shall not be installed over high humidity occupancies.
			3. Cementitious wood fiber decks shall have a minimum design load as recommended by the manufacturer.
			4. All cementitious wood fiber deck panels shall be anchored against uplift and lateral movement.
			5. The deck shall be installed level. Any deflection, irregularities or otherwise damaged panels shall be corrected or replaced.
			6. Install a mechanically attached base sheet prior to installation of insulation or roofing membrane.
		2. Gypsum
			1. Gypsum decks shall be smooth and free from deflections or ridges.
			2. An average fastener withdrawal resistance as recommended by the fastener manufacturer shall be obtained; however, at no time shall it be less than 40 lbs. (178 N) per fastener.
			3. Wet or frozen poured gypsum decks are not suitable to receive a roof.
			4. Poured-in-place gypsum roof decks contain a large percentage of moisture. All necessary precautions shall be taken to avoid the entrapment of moisture under the roofing system. In addition to ventilation of the underside to allow for proper curing, topside and perimeter venting shall be implemented.
		3. Recover
			1. Suitable roofs for recover shall be free of dust, dirt, debris and any contaminants that may adversely affect the performance of the new roof. Areas of substantial deck deflection or membrane imperfections shall be corrected prior to installing any new roofing.
			2. For recover installations over single-ply, fluid applied, coal tar and metal roofs, contact GAF Contractor Services for prior approval and technical requirements.
			3. Taking test cuts to verify the existing roof construction and condition. Three test cuts shall be made for roofs under 100 squares (930 sm) and one test cut per 100 squares (930 sm) above the minimum amount.
			4. Existing substrates and insulation (if applicable) shall be dry over the majority of the roof area. Wet or deteriorated areas of insulation and substrate shall be removed and replaced with new materials. When adhering insulation or new roofing directly to the existing roof surface, the existing roof system components shall be well attached to each other and their substrate.
			5. All applicable code requirements shall be met for recover over an existing roofing system.

\*\* NOTE TO SPECIFIER \*\* Proper drainage of the new roof system is required to eliminate ponding. Provisions shall be made to insure the new roof system has proper drainage, i.e., placement of additional roof drains, use of tapered insulation, use of crickets, etc., as appropriate.

* + - 1. When Stratavent Eliminator Venting Base Sheet is used as the first ply, the surface of the old smooth membrane shall be primed using Matrix 307 Asphalt/concrete Primer and allowed to dry.

\*\* NOTE TO SPECIFIER \*\* It is highly recommended and in certain circumstances, required, that a moisture survey be made to determine the extent of wet insulation and moisture entrapment. Contact GAF Contractor Services for more information on moisture surveys.
 \*\* NOTE TO SPECIFIER \*\* GAF does not recommend partial recover or re-roofing of a single roof area due to the potential for defects in the portion of the roof system not replaced or negatively affecting the performance of the new membrane. When required by project conditions or budget considerations, GAF requires full separation of the old and new roof areas by means of a full curb mounted expansion joint or area divider installed to provide a complete watertight seal or break between areas. Tie-in constructions, in which the old and new membranes are adhered directly to each other and stripped in are not acceptable for coverage under certain guarantees.

* 1. INSTALLATION - GENERAL
		1. Install GAF's GAFGLAS roofing system according to all current application requirements in addition to those listed in this section.

\*\* NOTE TO SPECIFIER \*\* Provide selected specification number if required. Delete if provision not used.

* + 1. GAF Specification #: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
		2. When the slope of the roof is 1 inch per foot or greater, install all plies parallel with the slope of the roof and install intermediate wood nailers as required for the specific roof slope. Plies shall extend over ridges and nailed on 6 inches centers
		3. Start the application of membrane plies at the low point of the roof or at the drains, so that the flow of water is over or parallel to, but never against the laps.
	1. BITUMEN
		1. Do not mix different types of asphalt.
		2. Use only ASTM D 312, Type II, Type III or Type IV Steep Asphalt. On slopes up to 1/2 inch per foot (40 mm/1000 mm), flat ASTM Type II asphalt may be used except in Florida, Texas, New Mexico, Arizona and California. Type IV asphalt shall be used on all slopes greater than 1/2 inches (13 mm) per foot (40 mm/1000 mm).
		3. Application with hot asphalt requires continuous, uniform interply mopping rates of 25 lb +/- 20 percent per 100 square feet (1.2 kg/sm) of roof area.
		4. Application temperature of the asphalt shall be at the Equiviscous Temperature (EVT) with a tolerance of +/- 25 degrees F (13.9 degrees C), at which a viscosity of 125 centipoise is attained. When using mechanical asphalt applicators, the target viscosity shall be 75 centipoise.
		5. For all SBS modified asphalt flashings; the minimum application temperature of the asphalt shall be at the EVT or 425 degrees F (218 degrees C), whichever is greater, with a rolling bank (puddle) of mopping asphalt across the full width of the roll.
		6. Do not heat the asphalt to or above its flash point or hold the asphalt at temperatures above the finished blowing temperature for more than 4 hours.
		7. Do not keep heated tankers above 325 degrees F (163 degrees C) overnight.

\*\* NOTE TO SPECIFIER \*\* Insulation. Delete if not required.

* 1. INSULATION - GENERAL
		1. Do not apply roof insulation or roofing until all other work trades have completed jobs that require them to traverse the deck on foot or with equipment. A vapor retarder coated lightly with asphalt may be applied to protect the inside of the structure prior to the insulation and final roofing installation. Before the application of the insulation, any damage or deterioration to the vapor retarder shall be repaired.
		2. Do not install wet, damaged or warped insulation boards.
		3. Install insulation boards with staggered board joints in one direction (unless taping joint).
		4. Install insulation boards snug. Gaps between board joints shall not exceed 1/4 inch (6 mm). All gaps in excess of 1/4 inch (6 mm) shall be filled with like insulation material.
		5. Wood nailers shall be 3-1/2 inches (89 mm) minimum width or 1 inch (25 mm) wider than metal flange. They shall be of equal thickness as the insulation with a minimum 1 inch (25 mm) thickness. All nailers shall be securely fastened to the deck.
		6. Do not kick insulation boards into place.
		7. Miter and fill the edges of the insulation boards at ridges, valleys and other changes in plane to prevent open joints or irregular surfaces. Avoid breaking or crushing of the insulation at the corners.
		8. Do not install insulation over old lightweight insulating concrete decks without the use of a vapor retarder. Insulation shall not be installed over new lightweight insulating concrete.
		9. Cant strips shall be installed at the intersection of the roof and all walls, parapets, curbs or transitions approaching 90 degrees, to be flashed. They shall be approximately 4 inches (102 mm) in horizontal and 4 inches (102 mm) in vertical dimension. The face of the cant shall have an incline of not more than 45 degrees with the roof.
		10. Roof tape, if required over insulation joints, shall be laid evenly, smoothly and embedded in a uniform coating of hot steep asphalt with 4 inches (102 mm) end laps. Care shall be taken to assure smooth application of tape and full embedment of the tape in the asphalt.
		11. Do not install any more insulation than will be completely waterproofed each day.

\*\* NOTE TO SPECIFIER \*\* Insulation. Delete if not required.

* 1. INSULATION - BASE LAYER

\*\* NOTE TO SPECIFIER \*\* Mechanically fastened. Delete if not required.

* + 1. The insulation shall be securely attached to the roof deck. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM fastening patterns. Factory Mutual requires fastener density increased in corner areas for FM 1-60 and perimeter and corner area fastener density increases for FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28 and 1-49.
		2. Use only fasteners with a minimum 3 inch (76 mm) stress plate when mechanically attaching insulation. Do not attach insulation with nails.

\*\* NOTE TO SPECIFIER \*\* Asphalt Adhered. Delete if not required.

* + 1. Install insulation layers, maximum 4 feet by 4 feet (1.22m by 1.22m) board size, in a full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/sm) +/- 20 percent. Press each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm) to eliminate continuous vertical gaps.

\*\* NOTE TO SPECIFIER \*\* Oly Bond. Delete if not required.

* + 1. The substrate shall be free of debris, dust, dirt, oil, grease and standing water before applying the adhesive.
		2. Install insulation layers applied with beads of Oly Bond 500 spaced 12 inches (305 mm) O.C. Approximate coverage rate is one (1) gallon per 100 square feet (0.42 l/sm), depending on the substrate. Allow the foam to rise 1/2 inch to 3/4 inch. Press each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm) to eliminate continuous vertical gaps.

\*\* NOTE TO SPECIFIER \*\* Insta-Stik. Delete if not required.

* + 1. The substrate shall be free of debris, dust, dirt, oil, grease and standing water before applying the adhesive.
		2. Install insulation layers applied with 3/4 inch (19 mm) beads of Insta-Stik spaced 12 inches (305 mm) O.C. Press each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm) to eliminate continuous vertical gaps.

\*\* NOTE TO SPECIFIER \*\* Loose Laid. Delete if not required.

* + 1. Loose lay the base layer of insulation for subsequent layers to be simultaneously attached. Minimal fastening shall be performed to avoid movement of the boards.

\*\* NOTE TO SPECIFIER \*\* Insulation. Delete if not required.

* 1. INSULATION - SUBSEQUENT LAYERS

\*\* NOTE TO SPECIFIER \*\* Simultaneous Attachment. Delete if not required.

* + 1. The insulation shall be securely attached to the roof deck. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM fastening patterns. Factory Mutual requires fastener density increased in corner areas for FM 1-60 and perimeter and corner area fastener density increases for FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28 and 1-49.
		2. Multiple layers of insulation of the same, non-tapered insulation material may be simultaneously mechanically fastened with approved fasteners and plates through the top layer of insulation to the structural deck. Individual layers of insulation shall not exceed 3 inches (7.6 mm) in thickness nor total thickness of all layers shall not exceed 5 inches (127 mm) without written approval of GAF Contractor Services.
		3. Use only fasteners with a minimum 3 inch (76 mm) stress plate when mechanically attaching insulation. Do not attach insulation with nails.

\*\* NOTE TO SPECIFIER \*\* Asphalt Adhered. Delete if not required.

* + 1. Install insulation layers, maximum 4 feet by 4 feet (1220 mm by 1220 mm) board size, in a full and uniform mopping of hot asphalt applied at the rate of 25 lb/square (1.2 kg/sm) +/- 20 percent. Press each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm) to eliminate continuous vertical gaps.

\*\* NOTE TO SPECIFIER \*\* Oly Bond. Delete if not required.

* + 1. The substrate shall be free of debris, dust, dirt, oil, grease and standing water before applying the adhesive.
		2. Install insulation layers applied with beads of Oly Bond 500 spaced 12 inches (305 mm) O.C. Approximate coverage rate is one (1) gallon per 100 square feet (0.42 l/sm), depending on the substrate. Allow the foam to rise 1/2 inch to 3/4 inch (13 mm to 19 mm). Press each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm) to eliminate continuous vertical gaps.

\*\* NOTE TO SPECIFIER \*\* Insta-Stik. Delete if not required.

* + 1. The substrate shall be free of debris, dust, dirt, oil, grease and standing water before applying the adhesive.
		2. Install insulation layers applied with 3/4 inch (19 mm) beads of Insta-Stik spaced 12 inches (305 mm) O.C. Press each board firmly into place. Stagger the joints of additional layers in relation to the insulation joints in the layer(s) below by a minimum of 6 inches (152 mm) to eliminate continuous vertical gaps.
		3. Do not install more insulation than can be completely waterproofed each day.
	1. BASE SHEET

\*\* NOTE TO SPECIFIER \*\* When fastening base sheets using screws and plates without insulation, the plate shall be of a design that allows it to lie flat on the deck.
 \*\* NOTE TO SPECIFIER \*\* Mechanically Attached Base. Delete if not required.

* + 1. Base Sheet:
			1. Roll the base sheet out over the deck and allow it to relax. Lap the base sheet so the flow of water is over or parallel to, but never against the laps.
			2. Lap the base sheet 2 inches (51 mm) and 4 inches (102 mm) on the ends. Keeping the base sheet taut, push out all wrinkles and buckles ahead as fastening proceeds.
			3. Turn base sheet up to the top of the cant.
			4. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			5. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM Fastening patterns. Factory Mutual requires fastener density increases in perimeter and corner zones for FM 1-60 and FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28, 1-29 and 1-49.
		2. Interply Sheets:

\*\* NOTE TO SPECIFIER \*\* Delete number of interply sheets not required.

* + - 1. One-ply interply application: Install full width ply sheets, lapping 2 inches (51 mm) on the sides and 4 inches (10.2 cm) on the ends. Stagger adjacent end laps a minimum of 18 inches (457 mm) apart. Where installed over base sheet, stagger ply sheet's side and end laps from underlying plies.
			2. Two-ply interply application: Install 19 11/16 inches (500 mm) and 39 3/8 inches (1000 mm) width starter plies and follow with a second 39 3/8 inches (1000 mm) width sheet with a maximum of 17 11/16 inches (449 mm) exposure, applied shingle fashion. Lap felts 20 11/16 inches (526 mm) with an 18 11/16 inches (475 mm) exposure and 6 inches (152 mm) on end laps. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			3. Three ply interply application: Install starter strips of 13 1/8 inches (333 mm), 26 1/4 inches (667 mm) and 39 3/8 inches (1000 mm) widths and follow with a second full 39 3/8 inches (1000 mm) width sheet with a maximum 11 1/8 inches (283 mm) exposure, applied shingle style. Lap felts 2615/16 inches (684 mm) with a 127/16 inches (316 mm) exposure and lap 6 inches(152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			4. Four-ply application: Install starter strips of 9 7/8 inches (251 mm), 19 11/16 inches (500 mm), 29 1/2 inches (749 mm) and 39 3/8 inches (1000 mm) widths and follow with a second full 39 3/8 inches (1000 mm) width sheet with a maximum 7-7/8 inches (200 mm) exposure, applied shingle style. Lap felts 30-1/16 inches (764 mm) with a 9-5/16 inches (236 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).

\*\* NOTE TO SPECIFIER \*\* Stratavent Perforated System base sheet and Interply sheets. Delete if not required.

* + 1. Base Sheets:

\*\* NOTE TO SPECIFIER \*\* Delete 2 of 3 applications of perforated base sheet not required.

* + - 1. Roll out perforated base sheet dry, granule-surface down, directly over isocyanurate insulation
			2. Roll out perforated base sheet dry, granule-surface down, directly over the asphalt primed structural concrete deck
			3. Roll out perforated base sheet dry, granule-surface down, directly over the asphalt primed existing smooth built up roof.
			4. Lap the base sheet 2 inches (51 mm) and 4 inches (102 mm) on the ends, with adjacent laps a minimum of 18 inches (457 mm) apart.
			5. Turn base sheet past the top of the cant and continue up the vertical wall terminating at final base flashing height.
			6. At edge terminations, turn the membrane down the face of the wall 2 inches (51 mm) and install the subsequent system ply/plies in hot asphalt over the perforated base sheet. The hot asphalt used to install the subsequent ply/plies mopped over the surface flows through the perforations to attach the base sheet and membrane system to the substrate.
		1. Interply Sheets:

\*\* NOTE TO SPECIFIER \*\* Delete 3 of 4 applications of the number of interply sheets not required.

* + - 1. One-ply interply application: Install full width ply sheets, lapping 2 inches (51 mm) on the sides and 4 inches (102 mm) on the ends. Stagger adjacent end laps a minimum of 18 inches (457 mm) apart. Where installed over base sheet, stagger ply sheet's side and end laps from underlying plies.
			2. Two-ply interply application: Install 19-11/16 inches (500 mm) and 39-3/8 inches (1000 mm) width starter plies and follow with a second 39-3/8 inches (1000 mm) width sheet with a maximum of 17-11/16 inches (449 mm) exposure, applied shingle fashion. Lap felts 20-11/16 inches (526 mm) with an 18-11/16 inches (475 mm) exposure and 6 inches (152 mm) on end laps. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			3. Three ply interply application: Install starter strips of 13-1/8 inches (333 mm), 26-1/4 inches (667 mm) and 39-3/8 inches (1000 mm) widths and follow with a second full 39-3/8 inches (1000 mm) width sheet with a maximum 11-1/8 inches (283 mm) exposure, applied shingle style. Lap felts 26-15/16 inches (684 mm) with a 12-7/16 inches (316 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			4. Four-ply application: Install starter strips of 9-7/8 inches (251 mm), 19-11/16 inches (500 mm), 29-1/2 inches (749 mm) and 39-3/8 inches (1000 mm) widths and follow with a second full 39-3/8 inches (1000 mm) width sheet with a maximum 7-7/8 inches (200 mm) exposure, applied shingle style. Lap felts 30-1/16 inches (764 mm) with a 9-5/16 inches (236 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).

\*\* NOTE TO SPECIFIER \*\* Stratavent Nailable System (LWIC) base sheet and Interply sheets. Delete if not required.

* + 1. Base Sheet:
			1. Roll the base sheet out over the lightweight insulating concrete deck and allow it to relax. Lap the base sheet so the flow of water is over or parallel to, but never against the laps.
			2. Lap the base sheet 2 inches (51 mm) and 4 inches (102 mm) on the ends. Keeping the base sheet taut, push out all wrinkles and buckles ahead as fastening proceeds.
			3. Turn base sheet up to the top of the cant and continue up the vertical wall terminating at final base flashing height.
			4. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			5. A minimum FMRC 1-60 attachment is recommended. Refer to FMRC Approval Guide for FM Fastening patterns. Factory Mutual requires fastener density increases in perimeter and corner zones for FM 1-60 and FM 1-90 or greater. Refer to FM Loss Prevention Data Sheets 1-7, 1-28, 1-29 and 1-49.
		2. Interply Sheets:

\*\* NOTE TO SPECIFIER \*\* Delete 3 of 4 applications of the number of interply sheets not required.

* + - 1. One-ply interply application: Install full width ply sheets, lapping 2 inches (51 mm) on the sides and 4 inches (102 mm) on the ends. Stagger adjacent end laps a minimum of 18 inches (457 mm) apart. Where installed over base sheet, stagger ply sheet's side and end laps from underlying plies.
			2. Two-ply interply application: Install 19-11/16 inches (500 mm) and 39-3/8 inches (1000 mm) width starter plies and follow with a second 39-3/8 inches (1000 mm) width sheet with a maximum of 17-11/16 inches (449 mm) exposure, applied shingle fashion. Lap felts 20-11/16 inches (526 mm) with an 18-11/16 inches (475 mm) exposure and 6 inches (152 mm) on end laps. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			3. Three ply interply application: Install starter strips of 13-1/8 inches (333 mm), 26-1/4 inches (667 mm) and 39-3/8 inches (1000 mm) widths and follow with a second full 39-3/8 inches (1000 mm) width sheet with a maximum 11-1/8 inches (283 mm) exposure, applied shingle style. Lap felts 26-15/16 inches (684 mm) with a 12-7/16 inches (316 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			4. Four-ply application: Install starter strips of 9-7/8 inches (251 mm), 19-11/16 inches (500 mm), 29-1/2 inches (749 mm) and 39-3/8 inches (1000 mm) widths and follow with a second full 39 3/8 inches (1000 mm) width sheet with a maximum 7-7/8 inches (200 mm) exposure, applied shingle style. Lap felts 30-1/16 inches (764 mm) with a 9-5/16 inches (236 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).

\*\* NOTE TO SPECIFIER \*\* Mopped Base and Ply sheets. Delete if not required.

* + 1. Base / Interply Sheets:
			1. Type III and Type IV asphalt may be used on slopes less than 3 inches per foot (250 mm per 1000 mm). Type IV shall be used on any slopes greater than 3 inches per foot (250 mm per 1000 mm).
			2. Asphalt shall be applied in a full uniform layer, at a rate of 25 lb/100 sf (1.2 kg/sm).
			3. Base Sheet: Install full width base sheets, lapping 2 inches (51 mm) on the sides and 4 inches (102 mm) on the ends. Stagger adjacent end laps a minimum of 18 inches (457 mm) apart. Turn all plies up and over the cant strip by 2 inches (51 mm).

\*\* NOTE TO SPECIFIER \*\* Delete 3 of 4 applications of the number of interply sheets not required.

* + - 1. One-ply interply application: Install full width ply sheets, lapping 2 inches (51 mm) on the sides and 4 inches (102 mm) on the ends. Stagger adjacent end laps a minimum of 18 inches (457 mm) apart. Where installed over base sheet, stagger ply sheet's side and end laps from underlying plies.
			2. Two-ply interply application: Install 19-11/16 inches (500 mm) and 39-3/8 inches (1000 mm) width starter plies and follow with a second 39-3/8 inches (1000 mm) width sheet with a maximum of 17-11/16 inches (449 mm) exposure, applied shingle style. Lap felts 20-11/16 inches (526 mm) with an 18-11/16 inches (475 mm) exposure and 6 inches (152 mm) on end laps. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			3. Three ply interply application: Install starter strips of 13-1/8 inches (333 mm), 26-1/4 inches (667 mm) and 39-3/8 inches (1000 mm) widths and follow with a second full 39-3/8 inches (1000 mm) width sheet with a maximum 11-1/8 inches (283 mm) exposure, applied shingle style. Lap felts 26-15/16 inches (684 mm) with a 12-7/16 inches (316 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).
			4. Four-ply application: Install starter strips of 9-7/8 inches (251 mm), 19-11/16 inches (500 mm), 29-1/2 inches (749 mm) and 39-3/8 inches (1000 mm) widths and follow with a second full 39-3/8 inches (1000 mm) width sheet with a maximum 7-7/8 inches (200 mm) exposure, applied shingle style. Lap felts 30-1/16 inches (764 mm) with a 9-5/16 inches (236 mm) exposure and lap 6 inches (152 mm) at ends. Stagger adjacent end laps a minimum of 18 inches (457 mm).
	1. SURFACING APPLICATION

\*\* NOTE TO SPECIFIER \*\* Delete surfacing sheet not required.

* + 1. Cap Sheet:
			1. Begin the application of the GAFGLAS Mineral Surfaced Cap Sheet at the low points of the roof so that the flow of water is never against the laps. Parallel lap lines of cap sheet shall not coincide with the lap lines of the underlying plies wherever possible. Application shall be over and parallel to the underlying roofing membrane.
			2. GAFGLAS Mineral Surface Cap sheet shall not be installed in full-length rolls. It shall be cut into shorter lengths, stacked and relaxed prior to installation. If the ambient temperature is 65 degree F or above, the roll can be cut in lengths up to 18 feet (5486 mm). If the temperature is below 65 degree F, the roll shall be cut in lengths no greater than 12 feet (3658 mm). Failure to cut and relax the cap sheet prior to installation may result in wrinkles, ridges and fishmouths.
			3. Embed the cap sheet in steep roofing asphalt applied at the nominal rate of 25 pounds per 100 square feet. Side laps shall be a minimum of 2 inches (51 mm) and end laps a minimum of 6 inches (152 mm). End laps shall be staggered by a minimum of 3 feet (76 mm). Uniformity of the separation of side laps is desirable for best appearance. All sheets shall be free of wrinkles, buckles, blisters, fishmouths or voids. End laps shall be nailed on all slopes exceeding 1 inch per foot.
			4. There are three acceptable methods of application:
				1. The flop in method involves setting the precut sheet with mineral surfaced side down adjacent to the area where it is to be applied with the lap of the previous course exposed. Solidly mop with roofing asphalt the full sheet width to be covered including the lap. The GAFGLAS Mineral Surfaced Cap Sheet shall be picked up at each end and at the outside edge, turned over and set immediately into the hot mopping.
				2. The fly in method involves mopping the full width of the area to be covered and then picking up a precut sheet and setting it immediately into the hot mopping.
				3. The re-roll method involves setting the precut sheet so it is in its exact final position, re-rolling it and then mopping immediately ahead of the roll as it is rolled in place.
			5. Brooming of the GAFGLAS Mineral Surfaced Cap Sheet shall be performed to ensure complete adhesion. When implementing the in the flop in and fly in methods, tension shall be placed on the precut sheet as it is being set to avoid wrinkles or buckles in the sheet.

\*\* NOTE TO SPECIFIER \*\* Delete surfacing sheet not required.

* + 1. Aggregate Surfacing:
			1. Aggregate surfacing may only be installed on roofs with slopes less than 3 inches per foot (250 mm/1000 mm).
			2. Not less than 400 lb/square (195 kg/sm) of gravel or 300 lb/square (14.6 kg/sm) of slag shall be applied in a flood coat of 60 lb/square (2.9 kg/sm) of hot asphalt.
			3. Gravel at the time of application shall be hard, durable, opaque and free of clay, loam, sand or other foreign substances and comply with ASTM D 1863.
			4. Asphalt shall conform to the latest revision of ASTM D 312 Type III or IV.
			5. No more asphalt shall be applied at one time than can be immediately covered with gravel or slag.

\*\* NOTE TO SPECIFIER \*\* Delete surfacing sheet not required.

* + 1. Coating:
			1. For a smooth surfaced GAFGLAS roof, the following coatings may be used with the limits indicated:

\*\* NOTE TO SPECIFIER \*\* Delete surfacing not required.

* + - * 1. ASTM D-312, Type I asphalt may be used on slopes of up to 1/2 inch per foot (42 mm/1000 mm) (North and South Zones only), applied at the rate of 20 pounds per 100 square feet (10 kg/sm).
				2. Leak Buster Matrix Fibered Aluminum Roof Coating may be used on slopes of 1/4 inch per foot (21 mm/1000 mm) or more (positive drainage, no ponding water), applied at the rate of approximately 1-1/2 to 2 gallons per 100 square feet. Steep asphalt at the laps shall be allowed to age at least 60-90 days and shall be free of dust and dirt prior to the application of Matrix Fibered Aluminum Coating.
				3. Leak Buster Matrix Fibered or Non-Fibered Emulsion may be used on slopes of up to 6 inches per foot (500 mm/1000 mm), applied at the rate of approximately 3 gallons per 100 square feet. Steep Roofing Asphalt at the laps shall be allowed to age at least one week and be free of dust and dirt prior to the application of Matrix Emulsion.
			1. Coating shall be applied directly to the roofing felts.
			2. Surfacing may be delayed for up to 90 days; however, the surface shall be clean and dry before proceeding with the coating.
			3. Reapplication of the coating shall be employed as part of a periodic maintenance program. The frequency will vary depending on climatic conditions.
			4. Coating of asphalt prior to the application of surface coatings will affect the UL ratings. For UL approved coatings over GAFGLAS systems, contact GAF Contractor Services.
	1. FLASHING APPLICATION

\*\* NOTE TO SPECIFIER \*\* Delete base flashing not required. Hot Asphalt (Option 1)

* + 1. Bituminous Base Flashings:
			1. Install GAF base flashing over all cant strips, horizontal to vertical transitions, roof edges and roof penetrations. Flashings are to be secured in accordance with current GAF application guidelines.
			2. Nailable curbs and walls shall be covered with a layer of approved GAFGLAS Base Sheet or backer ply fastened 8 inches (203 mm) o.c. in all directions with approved fasteners. All vertical laps shall be 4 inches (102 mm). Base sheet or backer ply shall extend out onto the field of the roof as shown in the applicable GAF construction detail.
			3. Prime all metal and masonry surfaces with asphalt primer and allow adequate drying time prior to adhering flashing plies.
			4. Backer plies installed over masonry or other non-nailable substrates shall be cut into manageable lengths to ensure adequate adhesion to the cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4 inches (102 mm). Backer plies shall extend onto the field of the roof as shown in the applicable GAF construction detail.
			5. The finished ply of base flashing shall be run vertically to provide a selvage edge that will aid in achieving proper adhesion at the 3 inches (76 mm) vertical laps. If the sheet is run horizontally, the vertical laps shall be a minimum of 6 inches (152 mm) and the selvage edge shall be removed form the sheet or fully covered by the counterflashing. The finished flashing ply shall extend out onto the field of the roof as shown in the applicable GAF construction detail and shall be extended a minimum of 4 inches (102 mm) beyond the edge of the prior flashing plies. The flashing shall be soundly adhered to the parapet, cant area and roof surface to result in a minimum void, non-bridging construction.
			6. Base flashing heights shall be a minimum of 8 inches (203 mm) and a maximum of 24 inches (610 mm) above the roofline.
			7. Use only Type III or Type IV hot asphalt. Maintain asphalt at the Equiviscous Temperature (EVT) +/- 25 degree F (13.9 degree C) for all base and ply sheets used in flashing details. Apply flashing membranes at the EVT temperature or 425 degree F (218 degree C) whichever is greater. Firmly press sheets into the adhesive and immediately nail the top of the flashing as specified it the appropriate flashing detail.
			8. Corner membrane flashings for outside corners and inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. An alternate method of corner reinforcing is to install a smooth MB membrane reinforcement piece on the prepared corner substrate prior to final surfacing membrane. Refer to BUR Flashing Details section of the GAF Application and Specifications Manual.

\*\* NOTE TO SPECIFIER \*\* Delete base flashing not required. Cold Adhesive (Option 2)

* + 1. Bituminous Base Flashings:
			1. Install GAF base flashing over all cant strips, horizontal to vertical transitions, roof edges and roof penetrations. Flashings are to be secured in accordance with current GAF application guidelines.
			2. Nailable curbs and walls shall be covered with a layer of approved GAFGLAS Base Sheet or backer ply fastened 8 inches (20.3 cm) o.c. in all directions with approved fasteners. All vertical laps shall be 4 inches (10.2 cm). Base sheet or backer ply shall extend out onto the field of the roof as shown in the applicable GAF construction detail.
			3. Prime all metal and masonry surfaces with asphalt primer and allow adequate drying time prior to adhering flashing plies.
			4. Backer plies installed over masonry or other non-nailable substrates shall be cut into manageable lengths to ensure adequate adhesion to the cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4 inches (10.2 cm). Backer plies shall extend onto the field of the roof as shown in the applicable GAF construction detail.
			5. The finished ply of base flashing shall be run vertically to provide a selvage edge that will aid in achieving proper adhesion at the 3 inches (7.6 cm) vertical laps. If the sheet is run horizontally, the vertical laps shall be a minimum of 6 inches (15.2 cm) and the selvage edge shall be removed form the sheet or fully covered by the counterflashing. The finished flashing ply shall extend out onto the field of the roof as shown in the applicable GAF construction detail and shall be extended a minimum of 4 inches (10.2 cm) beyond the edge of the prior flashing plies. The flashing shall be soundly adhered to the parapet, cant area and roof surface to result in a minimum void, non-bridging construction.
			6. Base flashing heights shall be a minimum of 8 inches (20.3 cm) and a maximum of 24 inches (61.0 cm) above the roofline.
			7. Use only trowel-grade modified adhesive. Apply using a trowel or wide-edged putty knife with a uniform 1/8 inches thickness throughout. Firmly press sheets into the adhesive and immediately nail the top of the flashing as specified it the appropriate flashing detail.
			8. Corner membrane flashings, such as bowties inches for outside corners and footballs inches for inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. An alternate method of corner reinforcing is to install a smooth MB membrane reinforcement piece on the prepared corner substrate prior to final surfacing membrane. Refer to BUR Flashing Details section of the GAF Application and Specifications Manual.

\*\* NOTE TO SPECIFIER \*\* Delete base flashing not required. Torch (APP or SBS) (Option 3)

* + 1. Bituminous Base Flashings:
			1. Install GAF base flashing over all cant strips, horizontal to vertical transitions, roof edges and roof penetrations. Flashings are to be secured in accordance with current GAF application guidelines.
			2. Nailable curbs and walls shall be covered with a layer of approved GAFGLAS Base Sheet or backer ply fastened 8 inches (203 mm) o.c. in all directions with approved fasteners. All vertical laps shall be 4 inches (102 mm). Base sheet or backer ply shall extend out onto the field of the roof as shown in the applicable GAF construction detail.
			3. Prime all metal and masonry surfaces with asphalt primer and allow adequate drying time prior to adhering flashing plies.
			4. Backer plies installed over masonry or other non-nailable substrates shall be cut into manageable lengths to ensure adequate adhesion to the cant strip and vertical surfaces without excessive voids. All vertical laps shall be 4 inches (102 mm). Backer plies shall extend onto the field of the roof as shown in the applicable GAF construction detail.
			5. The finished ply of base flashing shall be run vertically to provide a selvage edge that will aid in achieving proper adhesion at the 3 inches (76 mm) vertical laps. If the sheet is run horizontally, the vertical laps shall be a minimum of 6 inches (152 mm) and the selvage edge shall be removed form the sheet or fully covered by the counterflashing. The finished flashing ply shall extend out onto the field of the roof as shown in the applicable GAF construction detail and shall be extended a minimum of 4 inches (102 mm) beyond the edge of the prior flashing plies. The flashing shall be soundly adhered to the parapet, cant area and roof surface to result in a minimum void, non-bridging construction.
			6. Base flashing heights shall be a minimum of 8 inches (203 mm) and a maximum of 24 inches (610 mm) above the roofline.
			7. Apply the propane torch flame uniformly across the back surface of the membrane and lap areas until the compound reaches the proper application temperature and exhibits a slight sheen. Be careful during application to ensure the complete burn-off of release films where present on the underside of the rolls, membrane selvage edges or both surfaces as applicable. Avoid overheating, as it may result in damage to or the membrane or improper adhesion. Move the flame from side to side in the shape of an L, applying approximately 75 percent of the heat to the membrane and 25 percent to the substrate or underlying plies including the lap area of the previously installed courses. The membrane is slowly unrolled as heat is applied to ensure proper adhesion. Immediately nail the top of the flashing as specified in flashing detail.
			8. Corner membrane flashings, for outside corners and inside corners or other membrane reinforcements are required to ensure that base flashing corners are sealed at cant areas. An alternate method of corner reinforcing is to install a smooth MB membrane reinforcement piece on the prepared corner substrate prior to final surfacing membrane. Refer to BUR Flashing Details section of the GAF Application and Specifications Manual.
		2. Sheet Metal:

\*\* NOTE TO SPECIFIER \*\* Delete if Edge to Edge warranty is required.

* + - 1. Metal shall not be used as a component of base flashing. GAF assumes no responsibility for damage to the roofing system caused by the movement of accessory metal.

\*\* NOTE TO SPECIFIER \*\* Delete next two paragraphs if Edge to Edge warranty is not required. Because of the high coefficient of expansion of sheet metals and the large temperature changes that can be experienced on a roof, sheet metal or exposed metal components shall be isolated from the waterproofing components of the roofing and flashing system as efficiently as possible to prevent the metal from splitting the membranes.

* + - 1. Metal shall not be used as a component of base flashing.
			2. All metal edge details scheduled to be included in the Edge to Edge Coverage of the Diamond Pledge Guarantee shall be submitted and approved in writing by the manufacturer prior to project commencement.
			3. When it is unavoidable to use metal in the roofing system (i.e., lead flange at drains, gravel stops), treated wood nailers and insulation stops, 1 inches (25 mm) wider than the metal flange, shall be provided for metal flange securement. Metal flanges shall always be set on top of the roof membrane with modified trowel grade cold adhesive applied material for SBS roof systems. The metal flange is then sealed using the applicable construction detail to meet applicable guarantee requirements. Metal accessories (gravel stops, counter flashing, etc.) shall be 16 oz. (0.56 mm) copper, 24 gauge (0.71 mm) galvanized or stainless steel, 2-1/2 to 4 lb (1.1 to 1.8 kg) lead or 0.032 inches (0.81 mm) aluminum.
			4. Fabricate and install all sheet metal materials as shown in applicable construction details. Refer to SMACNA (Sheet Metal and Air Conditioning Contractors National Association, Inc.) for guidance on sheet metal treatments not addressed in this Manual.
			5. Clean metal and apply asphalt primer to all sheet metal surfaces that will come into contact with asphalt or other bituminous materials; allow the primer adequate time to dry.
			6. Use fastener types compatible with the sheet metal type.
				1. Copper or lead-coated copper: use copper or bronze fasteners.
				2. Lead and galvanized steel: use galvanized or cadmium-plated sheet fasteners.
				3. Aluminum: use aluminum fasteners.
				4. Stainless steel: use stainless steel fasteners.
			7. Metal counter-flashing shall have a minimum 4 inches (102 mm) face with a drip lip. The bottom edge of the counterflashing shall cover the roofing membrane and/or base flashing by a minimum of 4 inches (102 mm). Metal counter flashing used for masonry walls, wooden walls or through wall metal flashings shall be a two piece design to allow for installation and later removal. Metal counter-flashings for stucco, EIFS, wood siding or similar materials shall be designed to receive and set as a base for those materials, such as "Z" type flashing, while providing for securement of separate metal counter-flashing to cover base flashings. Metal end joints shall be lapped 3 inches (76 mm) or more. Adequate fasteners shall be provided to secure against wind forces. Skirt fasteners shall be watertight.

\*\* NOTE TO SPECIFIER \*\* Termination bars are not suitable in all base flashing and wall flashing conditions. Termination bars may only be used in conjunction with an appropriate counter-flashing extending a minimum of 4 inches (10.2 cm) below the termination bar.

* + - 1. Metal termination bars shall be a minimum of 1/10 inches (3 mm) thick by 1 inch (25 mm) wide with preformed sealant edge lap. Bar shall have 1/4 inches (6 mm) by 3/8 inches (10 mm) slotted holes on 4 inches (102 mm) centers to facilitate mechanical anchorage.
			2. Metal flanges for gravel stops, eave strips and pitch pockets to be used in conjunction with roofing shall be primed (both sides), set in modified trowel grade cold adhesive applied material for SBS roof systems. Flanges shall be a minimum of 3-1/2 inches (89 mm) wide for gravel stops or eave strips and 4 inches (102 mm) wide for projections and extensions through the roof. The gravel stop lip shall be at least 3/4 inches (19 mm) high. Eave strip lips shall be at least 3/8 inches (10 mm) high. Provisions shall be made for securing the skirt to the face of the wall. This may be wood nailer strips for masonry and metal construction. In all cases, gravel stop and eave strip nailer shall be fastened to the deck or deck system with adequate resistance against wind forces.
			3. Stacks shall have metal sleeve flashing a minimum of 8 inches (203 mm) high. Pitch pockets for brackets, supports, pad-eyes, etc., shall have a 4 inches (102 mm) minimum height metal sleeve.
			4. On reroofing projects, provisions shall be made for reinstallation of existing sheet metal duct work, equipment, coping metal and counter-flashing removed in conjunction with the new work. Also, provide for cleaning and repairing of existing defective sheet metal and replacement of missing and irreparable sheet metal to match existing types. Light gauge sheet metal flashings which are incorporated into the Ruberoid roof system are not suitable for re-use and shall be replaced with new material.
			5. Conduits and piping such as electrical and gas lines shall be set on wood blocking or some other form of support. Wood blocking/supports shall be set on doubler pads (an additional layer of the roof membrane).

\*\* NOTE TO SPECIFIER \*\* Delete if walkways are not required.

* 1. WALKWAYS

\*\* NOTE TO SPECIFIER \*\* This type of walkway is not for sidewalk or patio-type use.

* + 1. Walkways for normal rooftop traffic may be constructed from two plies of modified bituminous membranes.
		2. Construct walkways prior to the application of field surfacing by solidly adhering a first ply of smooth surfaced membrane to the field of the roof and then adhering a granule surfaced of membrane to the surface of the first ply.
		3. Walkway sections shall be no longer than 10 feet (3000 mm), with a 6 inches (152 mm) minimum gap between each section to allow for drainage.
		4. Surface the roof around and between the pads, making sure the selvage edge of the Ruberoid membrane is covered.
	1. ROOF PROTECTION
		1. Protect all partially and fully completed roofing work from other trades until completion.
		2. Whenever possible, stage materials in such a manner that foot traffic is minimized over completed roof areas.
		3. When it is not possible to stage materials away from locations where partial or complete installation has taken place, temporary walkways and platforms shall be installed in order to protect all completed roof areas from traffic and point loading during the application process.
		4. Temporary tie-ins shall be installed at the end of each workday and removed prior to commencement of work the following day.
	2. CLEAN-UP
		1. All work areas are to be kept clean, clear and free of debris at all times.
		2. Do not allow trash, waste or debris to collect on the roof. These items shall be removed from the roof on a daily basis.
		3. All tools and unused materials shall be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.
		4. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.
		5. Properly clean the finished roof surface after completion and make sure the drains and gutters are not clogged.
		6. Clean and restore all damaged surfaces to their original condition.

\*\* NOTE TO SPECIFIER \*\* Delete if Well Roof warranty not required.

* 1. MAINTENANCE
		1. Inspections to the roof shall be performed annually by a GAF Master Select contractor.
		2. An annual roofing system maintenance program shall be performed by a Master Select contractor in accordance with GAF's 10 Point Maintenance Program provided with your Diamond Pledge guarantee.
		3. Submit copies of the roof inspection form, accompanying photographs (a minimum of 6 photos showing the condition of the roof and critical details) and a record of all roofing system maintenance to the GAF Contractor Services Department within sixty (60) days of the anniversary date of the completion of the roofing system. Annual roof inspections shall be started within the first two (2) years of the guarantee term.

END OF SECTION