



## SECTION 07560

### FLUID-APPLIED ROOFING

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#### PART 1 GENERAL

##### 1.1 SECTION INCLUDES

- A. Elastomeric membrane roofing for installation over existing roofing.

##### 1.2 RELATED SECTIONS

- A. Section 06100: Rough Carpentry: Roof blocking installation and requirements.
- B. Section 07620: Sheet Metal Flashing and Trim: Metal flashing and counter flashing installation and requirements.
- C. Section 15430: Plumbing Specialties: roof drains, scuppers, gutters and downspout installation and requirements.

##### 1.3 REFERENCES

- A. Factory Mutual (FM Global) - Approval Guide.
  - 1. Factory Mutual Standard 4470 - Approval Standard for Class 1 Roof Covers.
- B. Underwriters Laboratories (UL) - Roofing Systems and Materials Guide (TGFU R1306).
- C. ASTM International (ASTM) - Annual Book of ASTM Standards.
  - 1. ASTM D 1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
  - 2. ASTM D 1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films.
  - 3. ASTM D 4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
  - 4. ASTM D 4798 / D4798M – 1- Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method).
  - 5. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials.
  - 6. ASTM E 108 - Standard Test Methods for Fire Tests of Roof Coverings.
  - 7. ASTM G 26 - Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials.
  - 8. ASTM G 53 - Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials.

- D. Sheet Metal and Air Conditioning Contractors National Association, 1nc. (SMACNA) - Architectural Sheet Metal Manual.
- E. National Roofing Contractors Association (NRCA).
- F. American Society of Civil Engineers (ASCE).
  - 1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

#### 1.4 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.

#### 1.5 SYSTEM DESCRIPTION

- A. The United Coatings™ roofing work includes roofing, flashing and reinforcing of joints and junctions, and roof accessories integrally related to roof installation.
- B. Final determination of the fitness of the system, or its components, for any given metal roof may not be made by any representative of GAF / United Coatings™ other than a member of GAF's Field Services Department.
- C. 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 current revision of ASCE 7.
- D. GAF shall provide all primary roofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

#### 1.6 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. [ [Product Data](#) ]:
  - 1. Provide [ [Product Data](#) ] sheets for each type of product indicated in this section.
- C. Shop Drawings:
  - 1. Provide manufacturers standard details and approved shop drawings for the system specified.

#### 1.7 QUALITY ASSURANCE

- A. Manufacturer Qualifications: GAF shall provide a roofing system that meets or exceeds the criteria listed in this section.
- B. Installer Minimum Qualifications:
  - 1. Installer shall be classified as a Premium Contractor as defined and certified by GAF.
  - 2. Installer shall be classified as a Master Select Contractor as defined and certified by GAF.
  - 3. Installer shall be classified as a Master Contractor as defined and certified by GAF.
  - 4. Installer shall be classified as an Authorized Contractor as defined and certified by GAF.

- C. Source Limitations: Components listed shall be provided by a single manufacturer or approved by the primary roofing manufacturer.

#### 1.8 PRE-INSTALLATION CONFERENCE

- A. 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.
  1. Tour representative areas of roofing substrates to inspect and discuss conditions of substrate, penetrations and other preparatory work to be performed.
  2. Review United Coatings™ roofing system requirements (United Coatings™ specifications, detail drawings and the Contract Documents).
  3. Review required submittals, both completed and in progress.
  4. Review and finalize the construction schedule related to roofing work, and verify availability of materials, installer's personnel, equipment and facilities needed to consistently make progress and avoid delays.
  5. Review required inspection(s), testing, and certifying, and material usage accounting procedures. Review forecasted weather conditions.
  6. Establish procedures for coping with unfavorable conditions, including the possibility of temporary roofing work.

#### 1.9 REGULATORY REQUIREMENTS

- A. Work shall be performed in a safe, professional manner, conforming to federal, state and local codes.
- B. UL Listing: Provide United Coatings™ Roofing System and component materials which have been evaluated by Underwriters Laboratories for flame-spread, and are listed in the "Underwriters Laboratory Roofing Materials and Systems Directory" for Class A construction over existing metal or other non-combustible roofing (Flame-spread shall pass ASTM E-108 and/or UL 790). Provide roof covering materials bearing UL approval marking on the container. This indicates that the material has been subjected to UL's examination, test procedures and follow-up inspection service.

#### 1.10 DELIVERY, STORAGE, AND HANDLING

- A. Store and handle United Coatings™ materials in a manner that will ensure there is no possibility of contamination.
- B. Store in a dry, well ventilated, weather tight location at temperatures between 50 degrees F (10 degrees C) and 80 degrees F (27 degrees C) until the products are ready to be applied (keep from freezing). Do not stack material pallets more than two (2) high.
- C. Do not subject existing roof to unnecessary loading of stockpiled materials.
- D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

#### 1.11 PROJECT CONDITIONS

- A. 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.
- B. Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with United Coatings™ recommendations and guarantee requirements as follows:
  - 1. Do not begin work if precipitation is expected within twenty-four hours of application, or if temperatures are expected to fall below 42 degrees F (6 Degrees C) during the duration of the job.
    - a. FlexSeal™ Sealant may be used in temperatures lower than 42 degrees F (6 Degrees C).
  - 2. Upper temperature restriction (both air and substrate) for application of United Coatings™ products is 105 degrees F (40 degrees C). If substrate temperatures exceed 105 degrees F (40 degrees C), United Coatings™ products shall be applied during cooler periods of the day. If this is not practical, the substrate shall be cooled with water, and then United Coatings™ products applied just after the water has flashed-off.
  - 3. No moisture may be present when applying United Coatings™ products. Taking into consideration the UV curing properties of United Coatings™ TCM, allow for sufficient daylight hours necessary for curing of materials.

## 1.12 WARRANTY

- A. Liquid Applied Diamond Pledge™ NDL Roof Guarantee: Manufacturers standard form, without money limitation, in which GAF agrees to repair leaks through the United Coatings™ products on the roof caused by manufacturing defects, natural deterioration of, or workmanship in applying, the United Coatings™ roofing system.
  - 1. Warranty Duration:
    - a. Ten (10) Years Labor and Material
    - b. Fifteen (15) Years Labor and Material
    - c. Twenty (20) Years Labor and Material
- B. Liquid Applied Emerald Pledge™ Limited Warranty: Manufacturers standard form, in which United Coatings™ agrees to repair leaks through the United Coatings™ products on the roof caused by manufacturing defects or natural deterioration of the United Coatings™ roofing system.
  - 1. Warranty Duration: Ten (10) Years.
- C. Limited Material Warranty: Manufacturers standard form, in which United Coatings™ agrees to reimburse the owner in the event of a manufacturing defect that adversely affects the performance of the United Coatings™ Membrane.
  - 1. Warranty Duration: Five (5) Years.

## PART 2 PRODUCTS

### 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: GAF, Commercial Roofing Products Division, which is located at: 1 Campus Drive; Parsippany, NJ 07054; Toll Free Tel: 800-ROOF-411; Tel: 973-628-3000; Fax: 973-628-3451; Email: [technicalquestions@gaf.com](mailto:technicalquestions@gaf.com) ; Web: [www.gaf.com](http://www.gaf.com)
- B. Substitutions: Not permitted.

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

## 2.2 COATINGS

- A. United Coatings™ Surface Seal SB Roof Coating: Solvent-based, sprayable, thermoplastic rubber liquid, which cures to form a seamless rubber membrane. It is highly reflective, flexible and nearly impervious to water. It is available in white, aluminum and custom colors and may be applied in temperatures under 42 degrees F (5.6 degrees C). Surface Seal SB will not freeze and resists "wash-off" by rain before curing is complete.
  1. Application Rate: 1.0 to 1.5 gal / 100 sf (.51 to .80 l/sqm.) per coat.
  2. Application Method: Airless sprayer.
  3. Application Temperature (air, surface): 32 degrees (0.0 degrees C) - 120 degrees F (49 degrees C).
  4. Dry Time (75 degrees F (24 degrees C), 50 percent RH): Approximately 24 hours per coat.
  5. Clean up: Mineral spirits.

## 2.3 FLASHINGS, FABRIC AND BULKING AGENTS

- A. United Coatings™ Roof Mate Butter Grade Flashing: A high volume solids for low shrinkage providing increased tensile strength and elongation on problem roof areas. It is ideally suited for sealing mechanical fasteners and horizontal seams on metal roofs, as well as around flashings, drains and protrusions. Also used for encapsulating Roof Mate Fabric.
  1. Application Rate: apply up to ¼" (6.4 mm) thickness
  2. Application Method: Putty Knife, spatula and stiff bristle brush.
  3. Application Temperature (ambient): minimum 50 degrees (10 degrees C).
  4. Dry Time: 1-4 hours depending on application thickness
  5. Clean-up: Water before curing.
  
- B. United Coatings™ Roof Mate Fabric: Non-woven, stitch-bonded polyester fabric that is used in conjunction with United Coatings™ TCM Flashing (Spray Formula) at all seams, roof penetrations, joints or changes in plane that have high shear or stress. Use of Roof Mate Fabric is mandatory on all horizontal seams (except corrugated metal and those with Roof Mate Liquid Fabric application) and penetrations.

## 2.4 PRIMERS AND SEALANTS

- A. Acrylex 400 Primer: A water-based, medium viscosity material, providing corrosion protection, flash rust resistance and enhanced adhesion over steel, aluminum and galvanized metal surfaces. Single component, premium quality exterior acrylic latex primer that is blister and stain resistant, permanently flexible and highly durable. It exhibits excellent corrosion resistance over metal substrates and alkali resistance over concrete and masonry.
  1. Application Rate: 150 to 300 sf (13.9 to 27.9 sqm) per gallon depending on substrate, surface and porosity.
  2. Application Method: Brush or conventional or airless sprayer.
  3. Application Temperature (air, surface): 50 degrees (10 degrees C) – 105 degrees F (40 degrees C).
  4. Dry Time: 75 degrees F (24 degrees C), 50 percent RH: 20-30 minutes
  
- B. XR-2000 Primer: White, water-based adhesion promoting primer designed to enhance the adhesion of the United Coatings™ roofing system to pre-finished metal roofing, including those containing fluoropolymers such as KYNAR® or siliconized polyesters.

Due to the wide variety of pre-applied finishes, suitability of XR-2000 Primer shall be tested on an individual basis. Do not apply in temperatures under 42 degrees F (5.6 degrees C).

1. Application Rate: 0.75 gallon / 100 sf (0.4 l/sqm.).
  2. Application Method: Roller or airless sprayer.
  3. Application Temperature (air, surface): 42 degrees (5.5 degrees C) – 120 degrees F (49 degrees C).
  4. Dry Time: 75 degrees F (24 degrees C), 50 percent RH: Approximately 6 hours.
- C. Lock-Down Primer: Single component, moisture cured, low viscosity, aluminized polyurethane primer designed to enhance adhesion of coatings to sound, stable, moderately corroded metal, or to provide a thin protective finish where desired.
1. Application Rate: 1 gallon / 250 sf (0.7 l/sqm.).
  2. Application Method: Roller or airless sprayer.
  3. Application Temperature (air, surface): 50 degrees (10 degrees C) – 105 degrees F (40 degrees C).
  4. Dry Time: (to touch) 75 degrees F (24 degrees C), 50 percent RH: Approximately 1 hour. (to cure) 75 degrees F (24 degrees C), 50 percent RH: Approximately 12 hours.
- D. UniTile LV Sealer: Two-component, penetrating primer/sealer, especially formulated to penetrate, prime, and seal porous surfaces.
1. Application Rate: Refer to table in current technical specification for details.
  2. Application Method: Roller or airless sprayer.
  3. Application Temperature (air, surface): 50 degrees (10 degrees C) - 105 degrees F (40 degrees C).
  4. Dry Time: (to touch) 75 degrees F (24 degrees C), 50 percent RH: Approximately 1 hour. (to cure) 75 degrees F (24 degrees C), 50 percent RH: Approximately 6 hours.
- E. FlexSeal™ Sealant: White, solvent-based synthetic elastomeric compound designed to line and waterproof interior and exterior gutters typically found in metal buildings. FlexSeal™ Sealant is capable of withstanding ponding water. This product is easiest to apply at temperatures over 42°F.
1. Application Rate: 0.5 gallon / 100 sf (0.3 l/sqm.).
  2. Application Method: Roller or airless sprayer.
  3. Application Temperature (air, surface): 20 degrees F (-6.6 degrees C) - 120 degrees F (49 degrees C).
  4. Dry Time: 75 degrees F (24 degrees C), 50 percent RH: Approximately 24 hours.

## 2.5 EQUIPMENT

- F. Airless Sprayer and Accessories: As recommended by GAF's Technical Services.

## PART 1 EXECUTION

### 1.1 SUBSTRATE CONDITIONS

- A. Installer shall prepare test patches to check adhesion. Questionable substrates shall be directed to GAF's Field Services Department for resolution.
- B. Preparation of Test Patches: Installer shall prepare no less than three (3) test patches for all questionable roof substrates to verify adhesion of United Coatings™ products. Minimum test patch size shall be one square foot (0.1 sqm.). After the test patches have been applied, allow at least one week of drying time before

checking adhesion. Check adhesion by slicing an "X" (approx. 6 inches (152 mm) in size) near the center of the test patch. Then try to remove the United Coatings™ material at the center of the "X" with a spatula. Test patches shall be labeled and photographed to document adhesion test results. Installer shall consult with the GAF's Technical Services Department concerning all results.

## 1.2 PREPARATION OF SUBSTRATE

- A. Preparation of the Roof substrate is the responsibility of the Installer. Installer shall address and correct all of the conditions listed in this section. Examine substrates to receive new roofing. Do not proceed with installation of the United Coatings™ roofing system until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer (GAF).
- B. Treatment of excessive gaps: All large or excessive gaps existing between roof panels shall be closed or made flush with self-drilling fasteners. Closed-cell foam strips or polyurethane foam may be used to pre-fill voids larger than 1/4 inch (6 mm) before applying United Coatings™ Flashing Grade. Foam shall be shaped with a utility knife or other appropriate method to create a cant strip which facilitates both United Coatings™ adhesion and water drainage, as well as, prevents shearing of Roof Mate Fabric on metal edges.
- C. Installation of sheet metal crickets: Sheet metal crickets shall be installed according to manufacturer's specifications (minimum 26 gauge (0.455 mm) metal - heavier gauge required for larger crickets) on the high side of all curb units. Vertical ribs shall be cut a minimum of 2 inches (51 mm) from the cricket to allow both the cricket flanges to mount flush to the metal panel and facilitate water drainage. Cut vertical ribs shall then be treated in the same fashion as a void larger than a 1/4 inch (6 mm). New crickets shall be "sealed" by placing a continuous bead of FlexSeal™ Sealant under the flanges before they are mechanically attached to the curb unit and metal roof panel. Then, the cricket flanges shall be stitch-screwed to the curb unit and metal roof panel while the FlexSeal™ Sealant is still wet using fasteners. This procedure shall apply to installation of all new crickets and curbs.
- D. Treatment of Ponding Water Areas: Installer shall make every effort to mechanically eliminate all ponding water areas on the roof prior to application of United Coatings™ products. Ponding water is defined as water which does not properly drain and remains on the roof surface for more than 48 hours after precipitation stops. Ponding water areas which cannot be eliminated shall be treated with FlexSeal™ Sealant prior to application of other United Coatings™ products.
- E. Repair of Dented / Damaged Panels: Installer shall repair dented and/or damaged metal roof panels. Dents shall be mechanically removed to the maximum extent possible. If ribs are broken, Installer shall cover the broken rib area with a sheet metal cap. Sheet metal rib caps shall be sealed to the roof by applying United Coatings™ Flashing Grade over the entire broken rib area to be capped prior to attaching the cap with fasteners. Then, United Coatings™ Roof Mate Butter Grade shall be used to seal all the newly created rib cap seams and fasteners. Roof panels that are severely damaged shall be removed and replaced prior to application of United Coatings™ products.
- F. Re-tightening and Replacement of Fasteners: All fasteners shall be re-tightened, secured or replaced, as necessary. All stripped fasteners shall be replaced with larger diameter fasteners, and the area re-secured by adding a new fastener next to the one that was stripped. All missing fasteners shall be replaced. In evaluating a roofing substrate for the application of the United Coatings™ System, it is important to note the manner in which the roof is fastened. The fastening pattern may require

modification to facilitate the proper installation of the system.

- G. Thorough Cleaning / Removal of Existing Paints and Coatings: Metal substrate shall be pressure-washed with water. A minimum working pressure of 3,000 psi (20 MPa) shall be used to remove all delaminating paint and coatings dirt, dust, and waste products (oil, oil-based roof cements, solvents, grease, animal fats, etc.). A Roto-spray tip is required to expedite metal panel cleaning. All existing silicone-based sealants shall be completely removed from roof substrate prior to application of United Coatings™ products. In some cases, a sand injection system may be required during the pressure washing to obtain proper adhesion for United Coatings™ products. When encountering roof substrates that have living organisms such as algae, mold or fungus, a bleach solution shall be used to kill and remove these organisms during the roof cleaning.
- H. Treatment of Residual Asphalt: Installer shall make every effort to remove asphaltic roofing elements. Removal efforts shall include use of methods such as pressure washing, scrapers, wire brushes, electric drill wire-wheels, or other similar tools. Residual asphalt is defined as asphaltic material remaining after the exercise of all required removal efforts, and exists when there is asphaltic material greater in thickness than 3 mils (.08 mm) over an area greater than 1 square foot (0.1 sqm.). Residual asphalt shall be coated with United Coatings™ MB Plus Coating.
- I. Treatment of Rust Areas: For areas of minor rust areas treat with United Coatings™ Acrylex 400 Primer to prevent further deterioration of the metal roof panels. Prior to Acrylex 400 Primer application, remove all loose, flaking or powdery rust by wire brushing if it has not been removed during the pressure washing. All rust shall be completely covered by the Acrylex 400 Primer. For heavily rusted areas the use of Lock-Down Primer is required. Installer shall exercise special care when applying primer in high temperature conditions (substrates approaching 105 degrees F / 40 degrees C). Substrate temperatures shall be kept below 105 degrees F (40 degrees C) when applying primer. Areas where rust is very heavy on roof panels shall be treated with Lock-Down Primer. This will help prevent rust bleed-through after roof panels have been properly prepared in accordance with United Coatings™ specifications. Roof panels which are corroded to the point where holes are present shall be replaced.
- J. Priming of Pre-Finished Metal Panels: Where roof panel surfaces are known or suspected to contain Kynar-500, other fluoropolymers or silicone, test patches shall be prepared with and without the use of XR-2000 Primer. Based on test patch adhesion results, Installer shall apply XR-2000 Primer on pre-finished metal panels per specifications. Please note that since XR-2000 Primer has rust inhibiting properties, Stable Rust Primer is not required where XR-2000 Primer has been used.
- K. Pitch Pans: For most situations, pitch pans shall be capped with sheet metal so they can be sealed with United Coatings™ products. Contact GAF's Technical Services Department for more information.
- L. Neoprene Pipe Boots: United Coatings™ recommends the installation of neoprene boots prior to flashing work being performed for certain types of pipe penetrations. Neoprene boots shall first be sealed to the roof using a bead of FlexSeal™ Sealant prior to mechanical attachment with fasteners. Contact GAF's Technical Services Department for more information.
- M. Open Ridge Vents: Open ridge vents (as shown in detail drawings) may begin to corrode on the inside, and over time, may leak. United Coatings™ highly recommends either replacement or the installation of sheet metal caps over the open ridge vents when they are rusted on the inside and/or located in a harsh environment



(e.g., salt water areas). Sheet metal caps shall be installed when leaks are suspected from the vents. Installation of a cap on the ridge vent will prevent water entry while allowing air to continue to flow through the vent. Do not seal weep holes on the vents. Inadequate roof ventilation may cause blistering in the United Coatings™ roofing system due to inside air "blowing-out" through roof panel seams. When this condition occurs, it may not allow for proper curing of the United Coatings™ Roof Mate Butter Grade Flashing material which may cause blisters.

- N. Condensate Lines: United Coatings™ recommends the installation of condensate lines from HVAC units to gutters as part of the overall roofing contract. Type of piping used for condensate lines may vary depending on local building codes. Lines shall be securely fastened to panel ribs.
- O. Moisture Scan: A moisture scan shall be performed on the roof system to determine the suitability of the existing roof for application of a United Coatings™ roofing system. Any wet or deteriorated areas shall be removed and replaced.
- P. Preparation of the Roof substrate is the responsibility of the installer, who shall address and correct all of the conditions listed in this section. Examine substrates to receive new roofing. Do not proceed with the installation of the United Coatings™ roofing system until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer (GAF).
- Q. Treatment of Ponding Water Areas: Installer shall make every effort to mechanically eliminate all ponding water areas on the roof prior to application of United Coatings™ products. Ponding water is defined as water that does not properly drain and remains on the roof for more than 48 hours after precipitation stops. Ponding water areas that cannot be eliminated shall be treated with FlexSeal™ Sealant prior to application of other United Coatings™ products.
- R. Thorough Cleaning / Removal of Existing Paints and Coatings: The substrate shall be pressure-washed with water. A minimum working pressure of 2,000 psi (13MPa) (shall be used to remove all delaminating paint and coatings, dirt, dust, and waste products (oil, oil-based roof cements, solvents, grease, animal fats, etc.). All existing silicone-based sealants shall be completely removed from the roof substrate prior to application of United Coatings™ products. The operator of the pressure washing equipment shall take special care in avoiding the introduction of water into the existing roof membrane. When encountering roof substrates that have living organisms such as algae, mold or fungus, a bleach solution shall be used to kill and remove these organisms during the roof cleaning.
- S. Deteriorated Seams/Cracks: Repair all delaminated or open seams using method acceptable to the manufacturer.
- T. Pitch Pans: Pitch pans shall be capped with sheet metal so they may be sealed with United Coatings™ products.
- U. Condensate Lines: Condensate lines shall be installed from HVAC units to gutters as part of the overall drainage system. The type of piping used for condensate lines may vary depending on local building codes.

### 1.3 RESURFACING EPDM

- A. Moisture Scan: A moisture scan shall be performed on the roof system to determine the suitability of the existing roof for application of a United Coatings™ roofing system.

Any wet or deteriorated areas shall be removed and replaced.

- B. Preparation: Preparation of the roof substrate is the responsibility of the installer, who shall address and correct all of the conditions listed in this section. Examine substrates to receive new roofing. Do not proceed with the installation of the United Coatings™ roofing system until unsatisfactory conditions have been corrected in a manner acceptable to the manufacturer (GAF).
- C. Treatment of Ponding Water Areas: Installer shall make every effort to mechanically eliminate all ponding water areas on the roof prior to application of United Coatings™ products. Ponding water is defined as water that does not properly drain and remains on the roof for more than 48 hours after precipitation stops. Ponding water areas that cannot be eliminated shall be treated with FlexSeal™ Sealant prior to application of other United Coatings™ products.
- D. Deteriorated Seams: Repair all delaminated or open seams using method acceptable to the manufacturer.
- E. Pitch Pans: Pitch pans shall be capped with sheet metal so they may be sealed with United Coatings™ products.
- F. Condensate Lines: Condensate lines shall be installed from HVAC units to gutters as part of the overall drainage system. The type of piping used for condensate lines may vary depending on local building codes.
- G. Membrane Cleaning: If grease, oils or heavy contaminants are present on the roof surface, remove them with a mild detergent prior to final cleaning. Bleach may be used to remove any algae, fungus or vegetation present.
- H. Application of EPDM Cleaner: Spray CleanAct Rinsable Primer over the entire surface to be coated at a rate of 1 gallon every 500 square feet. Cleaner should be applied with an industrial pump sprayer. After applying, pressure wash CleanAct Rinsable Primer from the surface with a working pressure of approximately 2000 psi. Use caution to not damage the membrane or allow water to infiltrate the roof system.

#### 1.4 FLASHING APPLICATION AND INSPECTION INFORMATION

- A. Preliminary work consists of substrate preparation (addressed earlier in specifications) and all flashing details. After completion of substrate preparation, all flashing details, horizontal seams, penetrations and curbs shall be flashed with either 6 inches (152 mm) or 12 inches (395 mm) Roof Mate Fabric and United Coatings™ Flashing Grade in accordance with United Coatings™ Detail Drawings. Flashing Grade shall be feathered at the edges (see current United Coatings™ Detail Drawings) to ensure that water flows over the various flashing details.
- B. Fasteners: All fasteners shall be fully encapsulated in United Coatings™ Roof Mate Butter Grade. In some cases, brushing may be required to obtain the proper feathering around fasteners. For fasteners found in the field of the roof (i.e., not at seams or roof penetrations), United Coatings™ recommends the use Roof Mate TCM Flashing.
- C. Gutter Straps: All gutter straps that are fastened above roof panels shall be fully encapsulated with United Coatings™ Roof Mate TCM Flashing, including the fasteners.
- D. Vertical Seams:
  - 1. Ribbed: All ribbed panel vertical seams shall be sealed with FlexSeal™

- Sealant. Feather the FlexSeal™ Sealant until seams are no longer visible while brushing in the direction parallel to the seam.
2. Standing Seam: All standing vertical seams shall be sealed with a 1/2 inch (12 mm) bead of FlexSeal™ Sealant. Feather FlexSeal™ Sealant until seams are no longer visible while brushing in the direction parallel to the seam.
  3. Standing "T" Seam: Both vertical seams of the standing "T" shall be flashed with a 1/2 inch (12 mm) bead of FlexSeal™ Sealant brushed into the seams.
  4. Inverted "J" Seam: In snowy climates and/or when roof leaks are suspected from this type of vertical seam, United Coatings™ requires re-crimping the short leg of the seam all the way under the horizontal portion of the inverted "J" seam. Brush or trowel apply FlexSeal™ Sealant over the newly created single lock vertical seam. Portable seamers may be used to perform the re-crimping.
  5. Corrugated: All corrugated panel vertical seams shall be sealed with United Coatings™ FlexSeal™ Sealant. Feather the FlexSeal™ Sealant until the seams are no longer visible while brushing in the direction parallel to the seam.
  6. Batten: Both vertical seams of the batten shall be flashed with a 1/2 inch (12 mm) bead of United Coatings™ FlexSeal™ Sealant. Feather FlexSeal™ Sealant until the seams are no longer visible while brushing in the direction parallel to the seam.
- E. Horizontal Seams: All horizontal seams shall be reinforced with a layer of United Coatings™ FlexSeal™ Sealant, one (1) layer of Roof Mate Fabric and then a final layer of United Coatings™ FlexSeal™ Sealant to completely encapsulate the Roof Mate Fabric. FlexSeal™ Sealant shall be feathered at least 1 inch (25 mm) beyond each side of the 6 inches (152 mm) width to allow water to flow over the seam. Roof Mate Fabric shall be cut around all fasteners so it lies flat. For ribbed roof panels, the Roof Mate Fabric shall be applied over panel ribs in continuous lengths. A minimum 2 inches (51 mm) overlap is required for all splices in Roof Mate Fabric. Roof Mate Fabric is not required for horizontal seams on corrugated roofing panels. Horizontal seams shall be secured with fasteners on the high side of every other corrugation spaced no more than 6" on center. When using United Coatings™ Roof Mate Liquid Fabric the horizontal seam shall be made flush by installing two fasteners per flute.
- F. Cinch Straps at Panel End laps: Re-tighten cinch straps, as necessary. Surround each strap and fastener head with a bead of FlexSeal™ Sealant. Fully inject FlexSeal™ Sealant into the cinch strap water channel to displace all air and moisture within the channel. Then seal the entire lap, strap and fastener heads with a minimum 6 inches (152 mm) width of FlexSeal™ Sealant. Feather the FlexSeal™ Sealant to prevent ponding water at the high side of the lap. The use of Roof Mate Fabric is not required for cinch straps at panel end laps.
- G. Ridge Caps: Except as noted, all ridge caps shall be flashed with a 6 inches (152 mm) or 12 inches (305 mm) width of Roof Mate Fabric and United Coatings™ FlexSeal™ Sealant. All voids and open areas in the ridge cap shall be filled with polyurethane foam prior to application of Roof Mate Fabric and FlexSeal™ Sealant. Metal "Z" closures which are located within 2 inches (51 mm) of the ridge cap edge, remove all exposed sealant and apply a liberal bead of United Coatings™ FlexSeal™ Sealant to all sides of the "Z" closure where they intersect with both the roof panel and ridge cap.
- H. Rakes: All fixed rake details for the roof shall be secured and sealed with a 6 inches (152 mm) minimum width of United Coatings™ FlexSeal™ Sealant and Roof Mate Fabric. If fixed rake metal is fastened to the top of roof panel ribs and extends back onto the roof, trim off any excess metal and follow horizontal seam flashing procedures. All voids and open areas shall be filled with polyurethane foam prior to application of Roof Mate Fabric and FlexSeal™ Sealant. For standing seam roof

panels, contact GAF's Technical Services Department for information.

- I. Parapet Walls: All parapet wall details within the roof system shall be secured and sealed with a 6 inches (152 mm) minimum width of United Coatings™ FlexSeal™ Sealant and Roof Mate Fabric. If parapet wall flashing metal is fastened to the top of roof panel ribs and extends back onto the roof, trim off any excess metal and follow horizontal seam flashing procedures. All voids and open areas shall be filled with polyurethane foam prior to application of Roof Mate Fabric and FlexSeal™ Sealant. For standing seam roof panels, contact GAF's Technical Services Department for information.
- J. Curb Flashings: All curb flashings, including cricket details, shall be flashed with at least a 6 inches (152 mm) width of Roof Mate Fabric and FlexSeal™ Sealant. Encapsulate all fasteners using United Coatings™ FlexSeal™ Sealant. Do not bridge fasteners. Roof Mate Fabric shall be cut around all fasteners so the fabric lies flat.
- K. Penetrations: United Coatings™ FlexSeal™ Sealant shall be applied around the base of all penetrations, extending at least 4 inches (102 mm) onto the vertical and 4 inches (102 mm) onto the base. Embed a 6 inches (152 mm) width of Roof Mate Fabric using additional FlexSeal™ Sealant, as necessary. Cut Roof Mate Fabric to accommodate the shape of the penetration. Both the top and bottom of neoprene pipe boots shall be flashed using United Coatings™ Flashing Grade FlexSeal™ Sealant and Roof Mate Fabric as described above.
- L. Skylights: Curb skylights shall be treated in the same fashion as Curb Flashings. The entire perimeter of flush-mounted skylights shall be flashed with a minimum 6 inches (152 mm) width of United Coatings™ FlexSeal™ Sealant and Roof Mate Fabric. All exposed skylight fasteners shall be encapsulated with United Coatings™ FlexSeal™ Sealant. Do not bridge fasteners. Roof Mate Fabric shall be cut around all fasteners so fabric lies flat. After flashing work has been completed and FlexSeal™ Sealant has cured, treat deteriorated fiberglass skylight panels with United Coatings™ Acrysheen Sealer.
- M. Gutters: Trowel or brush apply FlexSeal™ Sealant to the interior or exterior gutters incorporating 6 inches (152 mm) Roof Mate Fabric at all gutter seams. Gutter shall be completely clean and dry before applying FlexSeal™ Sealant.
- N. Ponding Water Areas: Contact the GAF's Technical Services Department for information.
- O. Inspect Preliminary Work / Flashing Details for problem areas (e.g., gaps, cracks, fishmouths, air pockets, etc.) to ensure that work is complete and satisfactory.
- P. Inform Project Architect and GAF's Technical Services Department when all preliminary work and flashing details will be complete and the Installer is ready to proceed with application of United Coatings™ Roofing Membrane. Allow a minimum of two (2) weeks for the interim inspection to be made by the GAF's Technical Services Department.
- Q. Any final roofing installation prior to this interim inspection is subject to rejection by the Project Architect and/or the GAF's Technical Services Department. Please be advised that Technical On-Site Support for instructing Certified Contractors in the proper application of the United Coatings™ Roofing System is available. The first day of instruction is at no-charge to the Certified Contractor. Any additional days or return trips for instruction will be at a cost of \$600.00 per day, plus all incurred travel expenses. The two (2) required inspections (interim and final) for the Liquid Applied

Roofing System Guarantees are free of charge. Additional inspections will be billed at a rate of \$ 600.00 per day plus all incurred travel costs.

#### 1.5 FLASHING APPLICATION AND INSPECTION INFORMATION

- A. Preliminary work consists of substrate preparation and all flashing details. After completion of substrate preparation, all flashing details, penetrations and curbs shall be flashed with either 6 inches (152 mm) or 12 inches (305 mm) Roof Mate Fabric and United Coatings™ FlexSeal™ Sealant in accordance with United Coatings™ Detail Drawings. FlexSeal™ Sealant shall be feathered at the edges (see current United Coatings™ Detail Drawings) so that water may flow over the various flashing details.
- B. Parapet Walls: All parapet wall details within the roof system shall be secured and sealed with a 6 inches (152 mm) minimum width of FlexSeal™ Sealant and Roof Mate Fabric. All voids and open areas shall be filled with polyurethane foam prior to application of Roof Mate Fabric and FlexSeal™ Sealant.
- C. Curb Flashings: All curb flashings, including cricket details, shall be flashed with at least a 6 inches (152 mm) width of Roof Mate Fabric and FlexSeal™ Sealant. Encapsulate all fasteners using FlexSeal™ Sealant. Do not bridge fasteners. Roof Mate Fabric shall be cut around all fasteners so fabric lies flat.
- D. Penetrations: FlexSeal™ Sealant shall be applied around the base of the penetration, extending at least 4 inches (101 mm) onto the vertical and 4 inches (101 mm) onto the base. Embed a 6 inches (152 mm) width of Roof Mate Fabric using additional FlexSeal™ Sealant, as necessary. Cut Roof Mate Fabric to accommodate the shape of the penetration. Both the top and bottom of neoprene pipe boots shall be flashed using FlexSeal™ Sealant and Roof Mate Fabric as described above.
- E. Skylights: Curb skylights shall be treated in the same fashion as curb flashings. The entire perimeter shall be flashed with a minimum 6 inches (152 mm) width of FlexSeal™ Sealant and Roof Mate Fabric. All exposed skylight fasteners shall be encapsulated with FlexSeal™ Sealant. Do not bridge fasteners. Roof Mate Fabric shall be cut around all fasteners so the fabric lies flat.
- F. Gutters: Trowel or brush apply FlexSeal™ Sealant to the interior or exterior gutter incorporating 6 inches (152 mm) Roof Mate Fabric at all gutter seams. Gutter shall be completely clean and dry before applying FlexSeal™ Sealant.
- G. Ponding Water Areas: The severity of the ponding water condition will determine the requirements for additional preparation. Contact the GAF's Technical Services Department for information.
- H. Inspect Preliminary Work / Flashing Details for problem areas (e.g., gaps, cracks, fishmouths, air pockets, etc.) to ensure that work is complete and satisfactory.

#### 1.6 FLASHING APPLICATION AND INSPECTION INFORMATION

- A. Preliminary work consists of substrate preparation and all flashing details. After completion of substrate preparation, all flashing details, penetrations and curbs shall be flashed with either 6 inches (152 mm) or 12 inches (305 mm) Roof Mate Fabric and United Coatings™ FlexSeal™ Sealant in accordance with United Coatings™ Detail Drawings. United Coatings™ FlexSeal™ Sealant shall be feathered at the edges (see current United Coatings™ Detail Drawings) so that water may flow over the various flashing details.
- B. Parapet Walls: All parapet wall details within the roof system shall be secured and

sealed with a 6 inches (152 mm) minimum width of United Coatings™ FlexSeal™ Sealant and Roof Mate Fabric. All voids and open areas shall be filled with polyurethane foam prior to application of Roof Mate Fabric and United Coatings™ FlexSeal™ Sealant.

- C. Curb Flashings: All curb flashings, including cricket details, shall be flashed with at least a 6 inches (152 mm) width of Roof Mate Fabric and United Coatings™ FlexSeal™ Sealant. Encapsulate all fasteners using United Coatings™ FlexSeal™ Sealant. Do not bridge fasteners. Roof Mate shall be cut around all fasteners so fabric lies flat.
- D. Penetrations: United Coatings™ FlexSeal™ Sealant shall be applied around the base of the penetration, extending at least 4 inches (101 mm) onto the vertical and 4 inches (101 mm) onto the base. Embed a 6 inches (152 mm) width of Roof Mate Fabric using additional United Coatings™ FlexSeal™ Sealant, as necessary. Cut Roof Mate Fabric to accommodate the shape of the penetration. Both the top and bottom of neoprene pipe boots shall be flashed using United Coatings™ FlexSeal™ Sealant and Roof Mate Fabric as described above.
- E. Skylights: Curb skylights shall be treated in the same fashion as curb flashings. The entire perimeter shall be flashed with a minimum 6 inches (152 mm) width of United Coatings™ FlexSeal™ Sealant and Roof Mate Fabric. All exposed skylight fasteners shall be encapsulated with United Coatings™ FlexSeal™ Sealant. Do not bridge fasteners. Roof Mate Fabric shall be cut around all fasteners so the fabric lies flat.
- F. Gutters: Trowel or brush apply FlexSeal™ Sealant to the interior or exterior gutter incorporating 6 inches (152 mm) Roof Mate Fabric at all gutter seams. Gutter shall be completely clean and dry before applying FlexSeal™ Sealant.
- G. Ponding Water Areas: The severity of the ponding water condition will determine the requirements for additional preparation. Contact the GAF's Technical Department for information.
- H. Inspect Preliminary Work / Flashing Details for problem areas (e.g., gaps, cracks, fishmouths, air pockets, etc.) to ensure that work is complete and satisfactory.

## 1.7 OTHER ITEMS

- A. Installer shall take photographs of representative roof areas, including detail work, before work commences, after the surface has been properly prepared, after all flashing and detail work has been performed, and after the spray application of the United Coatings™ membrane.
- B. Installer shall provide the following support for on-site inspections by a representative from GAF's Field Services Department (list is not comprehensive):
  - 1. Representative from the installer's company who has authority to make binding decisions
  - 2. Required means to access all areas of the treated roof.
  - 3. Previous photographs of the roof, including test patch results, as applicable
  - 4. United Coatings™ products and application equipment required to repair roof areas where destructive tests are to be performed by GAF's Field Services Department.
- C. Special care shall be taken to avoid shading when spraying dark United Coatings™ Roofing Membrane colors. When applying a dark United Coatings™ Membrane color, Installer shall always spray wet material onto wet material to ensure that spray

lines do not appear. United Coatings™ strongly recommends the installation of any dark-colored finish coat by spraying two lighter coats (instead of one heavy coat) using a smaller tip size. Installer should also use the roof ribs or standing seams to terminate each spray pass.

- D. Installer shall take special care when moving spray hoses and other equipment on the roof so that flashing work and encapsulated fastener heads are not damaged. Also, all spray equipment shall remain on the ground for the duration of the job.
- E. If there will be an extended period of time (6 months or greater) between application of base and finish coats, the use of United Coatings™ white for the base coat (versus gray) is recommended. The base coat shall be thoroughly cleaned before applying the finish coat.
- F. It is strongly recommended that walkways designed for metal roofing systems be installed in all high traffic areas. Contact the GAF's Technical Services Department for recommendations.

## 1.8 REPAIRS

- A. In the event that the United Coatings™ membrane is damaged or punctured, repairs are to be performed using United Coatings™ Roof Mate Butter Grade and Roof Mate Fabric (where necessary) as follows:
  - 1. Damaged areas are to be cut, cleaned and dried.
  - 2. Apply Roof Mate Butter Grade, and feather out onto the existing United Coatings™ membrane.
  - 3. If a new penetration area has been cut, embed Roof Mate Fabric into the Flashing Grade according to standard United Coatings™ specifications.
  - 4. Once the Roof Mate Butter Grade has cured, United Coatings™ white or appropriate United Coatings™ color may be applied for aesthetic uniformity.
  - 5. For required repairs during cold weather conditions (i.e., below 42 degrees F (5.6 degrees C), United Coatings™ Roof Mate Butter Grade or FlexSeal™ Sealant shall be used in lieu of water-based Flashing Grade.

END OF SECTION