SECTION 07 56 13

LIQUID-APPLIED ROOFING

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\*\* NOTE TO SPECIFIER \*\* GAF Commercial Roofing Products; liquid-applied roofing over metal and non-metal substrates.  
This section is based on the products of GAF Commercial Roofing Products, which is located at:1 Campus Dr.Parsippany, NJ 07054Toll Free Tel: 800-ROOF-411Tel: 973-628-3000Fax: 973-628-3451Email: [request info (designservices@gaf.com)](https://arcat.com/rfi?action=email&company=GAF%252BCommercial%252BRoofing%252BProducts&message=RE%253A%2520Spec%2520Question%2520(07561gaf)%253A%2520&coid=38425&spec=07561gaf&rep=&fax=973-628-3451)  
Web: <https://www.gaf.com>   
 [ [Click Here](https://arcat.com/company/gaf-commercial-roofing-products-38425) ] for additional information.  
Founded in 1886, GAF has become the largest roofing manufacturer in North America. The company's products include a comprehensive portfolio of steep-slope and commercial roofing systems, which are supported by an extensive national network of factory-certified contractors. Unlike some roofing manufacturers who seem to have a "one-technology-fits-all" mentality, GAF's goal is to help contractors build their businesses by matching the right roofing technology to clients' specific needs. The company offers all major low-slope roofing technologies, including repair and maintenance products and roof restoration systems (often at half the cost of a new roof), as well as new roofing systems; BUR, MB, TPO, PVC, and composite systems.  
GAF offers a wide array of energy-smart options, some of which are ENERGY STAR qualified and/or Title 24 Compliant, to take advantage of the growing interest in energy-saving, white reflective roofing. Special offerings include the Well Roof Guarantee Extension through Certified Maintenance Professionals, extends a low-slope roof guarantee by up to 25% for free, as long as regular maintenance is performed; see the Well Roof Guarantee Extension for complete requirements, and the All-American Pledge Guarantee, the first NDL guarantee that covers both low- and steep-slope roofs on a single property. If you'd like to take a deeper dive on our sustainability programs at GAF and that of the roofing industry generally, stop by www.gaf.com/green.  
GAF is proud to support CARE - the Center for the Advancement of Roofing Excellence which has provided education to over 125,000 professionals. CARE's mission is to help professional contractors and distributors build their businesses through sales and management education, and to provide product and installation training to contractors, distributors, architects, property owners, and related industry personnel.

1. GENERAL
   1. SECTION INCLUDES

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

* + 1. Liquid-applied roofing over non-metal substrates.
       1. Roof coatings.
       2. Flashings, fabric, and bulking agents.
       3. Primers and sealants.
    2. Liquid-applied roofing over metal substrates.
       1. Roof coatings.
       2. Flashings, fabric, and bulking agents.
       3. Primers and sealants.
  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.
    2. Section 07 62 00 - Sheet Metal Flashing and Trim.
    3. Section 22 30 00 - Plumbing Equipment.
  1. REFERENCES

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

* + 1. ASTM International (ASTM):
       1. ASTM D1079 - Standard Terminology Relating to Roofing, Waterproofing, and Bituminous Materials.
       2. ASTM D1653 - Standard Test Methods for Water Vapor Transmission of Organic Coating Films.
       3. ASTM D4263 - Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
       4. ASTM D4798 - Standard Practice for Accelerated Weathering Test Conditions and Procedures for Bituminous Materials (Xenon-Arc Method).
       5. ASTM D6083 - Standard Specification for Liquid Applied Acrylic Coating Used in Roofing
       6. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
       7. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.
       8. ASTM G26 - Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials.
       9. ASTM G53 - Practice for Operating Light- and Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials.
    2. American Society of Civil Engineers (ASCE):
       1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
    3. Factory Mutual (FM Global):
       1. FM Approval Guide.
       2. FM Standard 4470 - Approval Standard for Class 1 Roof Covers.
    4. National Roofing Contractors Association (NRCA):
       1. NRCA Roofing and Waterproofing Manual.
    5. Sheet Metal and Air Conditioning Contractors National Association (SMACNA):
       1. SMACNA Architectural Sheet Metal Manual.
    6. Underwriters Laboratories (UL):
       1. UL Roofing Materials and Systems Directory.
  1. DEFINITIONS
     1. Roofing Terminology: Refer to ASTM D1079 and the glossary of the NRCA Roofing and Waterproofing Manual for definitions of roofing terms related to this section.
  2. SUBMITTALS
     1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
     2. Product Data:
        1. Manufacturer's data sheets on each product to be used.
        2. Preparation instructions and recommendations.
        3. Storage and handling requirements and recommendations.
        4. Typical installation methods.

\*\* NOTE TO SPECIFIER \*\* Delete if not applicable to product type.

* + 1. Verification Samples: Two representative units of each type, size, pattern and color.
    2. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
  1. QUALITY ASSURANCE
     1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
     2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.

\*\* NOTE TO SPECIFIER \*\* Delete installer qualification options not required.

* + - 1. Installer shall be classified as a Premium Contractor as defined and certified by manufacturer.
      2. Installer shall be classified as a Master Select Contractor as defined and certified by manufacturer.
      3. Installer shall be classified as a Master Contractor as defined and certified by manufacturer.

\*\* NOTE TO SPECIFIER \*\* The following subparagraph applies only to liquid applied roofing over metal substrates. Delete if not required.

* + - 1. Installer shall be classified as an Authorized Contractor as defined and certified by manufacturer.
    1. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.

\*\* NOTE TO SPECIFIER \*\* Include mock-up if the project size or quality warrant the expense. The following is one example of how a mock-up on might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project.

* + 1. Mock-Up: Construct a mock-up with actual materials in sufficient time for Architect's review and to not delay construction progress. Locate mock-up as acceptable to Architect and provide temporary foundations and support.
       1. Intent of mock-up is to demonstrate quality of workmanship and visual appearance.
       2. If mock-up is not acceptable, rebuild mock-up until satisfactory results are achieved.
       3. Retain mock-up during construction as a standard for comparison with completed work.
       4. Do not alter or remove mock-up until work is completed or removal is authorized.
  1. PRE-INSTALLATION CONFERENCE
     1. Convene a conference approximately two weeks before scheduled commencement of the Work. Attendees shall include Architect, Contractor, manufacturer, and trades involved. The primary purpose of the meeting is to review foreseeable methods and procedures related to roofing work.
        1. The installer shall record conference discussions to include decisions, agreements, and open issues and furnish copies of recorded discussions to each attending party.
        2. Tour representative areas of roofing substrates to inspect and discuss conditions of substrate, penetrations and other preparatory work to be performed.
        3. Review coating system requirements.
        4. Review required submittals, both completed and in progress.
        5. 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.
        6. Review required inspections, testing, and certifying, and material usage accounting procedures. Review forecasted weather conditions.
        7. Establish procedures for coping with unfavorable conditions, including the possibility of temporary roofing work.
  2. DELIVERY, STORAGE, AND HANDLING
     1. Store and handle coating materials in a manner that will ensure there is no possibility of contamination.
     2. Store in a dry, well ventilated, weather tight location at temperatures between 50 and 90 degrees F (10 and 32 degrees C) until the products are ready to be applied, keep from freezing. Do not stack material pallets more than two high.
     3. Do not subject existing roof to unnecessary loading of stockpiled materials.
     4. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
  3. PROJECT CONDITIONS
     1. Weather:
        1. Proceed with roofing only when existing and forecasted weather conditions permit.
        2. Ambient temperatures shall be above 50 degrees F (10 degrees C) and rising when applying water based coatings.
     2. Proceed with roofing work only when existing and forecasted weather conditions will permit work to be performed in accordance with coating 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.
        2. Upper temperature restriction (both air and substrate) for application of coating products is 110 degrees F (43 degrees C). If substrate temperatures exceed 110 degrees F (43 degrees C), coating products shall be applied during cooler periods of the day. If this is not practical, the substrate shall be cooled with water, and then coating products applied just after the water has flashed-off.
        3. No moisture may be present when applying coating products. Taking into consideration the UV curing properties of coating allow for sufficient daylight hours necessary for curing of materials.
  4. WARRANTY

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

* + 1. Liquid Applied Diamond Pledge NDL Roof Guarantee: Manufacturer's standard form, without money limitation, in which manufacturer agrees to repair leaks through the coatings products on the roof caused by manufacturing defects, natural deterioration of, or workmanship in applying, the coatings roofing system.
       1. Warranty Coverage: Labor and materials.

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

* + - 1. Warranty Duration: Ten years.
      2. Warranty Duration: Fifteen years.
      3. Warranty Duration: Twenty years.
    1. Liquid Applied Emerald Pledge Limited Warranty: Manufacturer's standard form, in which manufacturer agrees to repair leaks through the coatings products on the roof caused by manufacturing defects or natural deterioration of the coatings roofing system.
       1. Warranty Coverage: Labor and materials.

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

* + - 1. Warranty Duration: Ten years.
      2. Warranty Duration: Fifteen years.
      3. Warranty Duration: Twenty years.
    1. Limited Product Warranty: Manufacturers standard form, in which manufacturer agrees to replace or reimburse the owner the portion of the products that leaks in the event of a manufacturing defect.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: GAF Commercial Roofing Products, which is located at:1 Campus Dr.Parsippany, NJ 07054Toll Free Tel: 800-ROOF-411Tel: 973-628-3000Fax: 973-628-3451Email: [request info (designservices@gaf.com)](https://arcat.com/rfi?action=email&company=GAF%252BCommercial%252BRoofing%252BProducts&message=RE%253A%2520Spec%2520Question%2520(07561gaf)%253A%2520&coid=38425&spec=07561gaf&rep=&fax=973-628-3451);Web: <https://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 - Product Requirements.
  1. PERFORMANCE REQUIREMENTS
     1. Standards Compliance:
        1. Listed in UL - Roofing Materials and Systems Directory for Class A construction.
        2. Flame spread shall pass ASTM E108 or UL 790.
        3. Roof covering materials shall bear UL approval marking on the container.
        4. Conforming to federal, state and local codes.
        5. Installed roofing membrane and base flashing system shall not permit the passage of water, and shall withstand the design pressures calculated in accordance with the current revision of ASCE 7.
     2. All primary roofing materials shall be physically and chemically compatible when installed in accordance with manufacturer's current application requirements.

\*\* NOTE TO SPECIFIER \*\* HydroStop provides fully reinforced membrane system designed to protect as a primary waterproofing membrane for a variety of substrates. ENERGY STAR rated systems are available with system warranties up to 25 years.

* 1. ROOF COATINGS
     1. Finish Coat, Basis of Design: HydroStop PremiumCoat Finish Coat; as manufactured by GAF, Commercial Roofing Products Division.
        1. Description: An acrylic, permanently flexible, highly UV-resistant, chemical-resistant elastomeric compound fully reinforced with a tough stitch-bonded polyester fabric designed for roofing and flashing applications of all types.
        2. Application Rate: 0.75 to 1.00 gallon per 100 sq.ft. (3.05 to 4.07 liters per 10 sq.m.) per coat.
        3. Application Method: Spray, roof brush or 1 inch (25.4 mm) nap roller.
        4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
        5. Dry Time, Touch: 1 to 4 hours at 77 degrees F (25 degrees C), with 40 percent RH.
        6. Full Cure: 7 days.
     2. Foundation Coat, Basis of Design: HydroStop PremiumCoat Foundation Coat; as manufactured by GAF, Commercial Roofing Products Division.
        1. Description: An acrylic, permanently flexible, highly UV-resistant, chemical-resistant elastomeric compound fully reinforced with a tough stitch-bonded polyester fabric designed for roofing and flashing applications of all types.
        2. Application Rate: 1.00 to 1.50 gallon per 100 sq.ft. (4.07 to 6.11 liters per 10 sq.m.) per coat.
        3. Application Method: Roof brush.
        4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
        5. Dry Time, Touch: 1 to 4 hours at 77 degrees F (25 degrees C), with 40 percent RH.
        6. Full Cure: 7 days.

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

* 1. FLASHINGS, FABRIC AND BULKING AGENTS

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

* + 1. Flashing, Basis of Design: HydroStop PremiumCoat Butter Grade Flashing; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: 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.
       2. Application Rate: 2.0 gallon per 200 linear feet with a 6 inch width (7.6 liters per 61 linear meters with a 152 mm width), typically requires 2 coats.
       3. Application Method: Putty knife, spatula, and stiff bristle brush.
       4. Application Temperature, Ambient: Minimum 50 degrees F (10 degrees C).
       5. Dry Time: 1 to 4 hours.
       6. Clean Up: Water before curing.
    2. Bulking Agent, Basis of Design: HydroStop Hydrofiber Bulking Agent; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: Comprised of glass fibers that, when mixed with one of the above listed products, will create a thick, workable compound used to fill voids, level surfaces, and create cants. Also used for flashing details, metal roof seams, inside and outside flashing details, round stacks, pipe legs, pitch pockets, conduit pipes, expansion joints, and similar applications.
       2. Application Rate: 0.50 gal per 1 gal (1.9 L per 3.8 L) of finish or foundation coat. Not to exceed 1:1
       3. Application Method: Brush.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: Minimum 24 hours.
       6. Clean Up: Water.
    3. Fabric, Basis of Design: HydroStop PremiumCoat Fabric; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: Tough, non-woven, stitch-bonded, heat-set polyester designed for roofing and flashing applications of all types.

\*\* NOTE TO SPECIFIER \*\* Delete roll size options not required.

* + - 1. Roll Size: 300 feet (91,400 mm) long by 4 inches (102 mm) wide.
      2. Roll Size: 300 feet (91,400 mm) long by 6 inches (152 mm) wide.
      3. Roll Size: 300 feet (91,400 mm) long by 8 inches (203 mm) wide.
      4. Roll Size: 300 feet (91,400 mm) long by 12 inches (305 mm) wide.
      5. Roll Size: 300 feet (91,400 mm) long by 16 inches (406 mm) wide.
      6. Roll Size: 300 feet (91,400 mm) long by 20 inches (508 mm) wide.
      7. Roll Size: 300 feet (91,400 mm) long by 24 inches (610 mm) wide.
      8. Roll Size: 336 feet (102,000 mm) long by 40 inches (1016 mm) wide.
    1. Seam Tape, Basis of Design: United Coatings UniTape Seam Tape; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: A polymer-backed woven polyester reinforcing fabric designed for application to a wide range of substrates where additional strength is required over seams, splits, transitions, protrusions, and similar applications.
       2. Service Temperature: Minus 30 to 180 degrees F (minus 35 to 82 degrees C).
       3. Bond Time: Initial bond is immediate, full bond requires approximately 24 hours.

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

* 1. PRIMERS AND SEALANTS FOR LIQUID-APPLIED ROOFING OVER NON-METAL SUBSTRATES

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

* + 1. Epoxy Primer, Basis of Design: Epoxy Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: Clear, single-component epoxy primer and sealer incorporating state of the art water-based technology to produce an extremely versatile product that penetrates and seals porous substrates. Effective at increasing the bond of acrylic, polyurethane, butyl and epoxy topcoats to a variety of surfaces. It will also help to solidify chalky surfaces. Safe to use, very little odor, and easy to clean up.
       2. Application Rate: 0.3 to 0.4 gallon per 100 sq.ft. (1.22 to 1.63 liters per 10 sq.m.).
       3. Application Method: Brush, roller, or sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: 30 minutes at 75 degrees F (24 degrees C).
    2. Primer, Basis of Design: Clean Act Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: Specifically developed for dramatically increasing the bond to new or weathered black EPDM surfaces. It is a low viscosity, pinkish liquid that chemically alters the black EPDM surface to which it is applied, creating a lock and key effect with the subsequent topcoat.
       2. Application Rate: 0.20 gallon per 100 sq.ft. (0.81 liters per 10 sq.m.).
       3. Application Method: Pump-up sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: 20 minutes, power wash after a minimum of 20 minutes and maximum of 2 hours.
    3. Primer, Basis of Design: UniBase Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: A low viscosity, highly penetrating, advanced acrylic polymer adhesive and primer designed to act as a bonding primer to enhance the adhesion over built-up, granulated cap sheets, modified bitumen roofing, concrete or previously coated surfaces, also acting as an excellent asphalt bleed blocker.
       2. Application Rate: 0.50 to 1.0 gallon per 100 sq.ft. (2.03 to 4.08 liters per 10 sq.m.).
       3. Application Method: Brush, roller, or sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: 1 to 2 hours at 70 degrees F (21 degrees C), with 50 percent RH.
    4. Sealant, Basis of Design: FlexSeal Sealant; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: 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 degrees F (4.4 degrees C).
       2. Application Rate: 2.0 gallon per 200 linear feet with a 6 inch width (7.6 liters per 61 linear meters with a 152 mm width), typically requires 2 coats.
       3. Application Method: Roller or airless sprayer.
       4. Application Temperature, Air and Surface: 20 to 120 degrees F (minus 6.6 to 49 degrees C).
       5. Dry Time: Approximately 24 hours at 75 degrees F (24 degrees C), with 50 percent RH.
    5. TPO Primer, Basis of Design: TPO Red Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: VOC-compliant solvent-based thermoplastic liquid designed to be applied over new or aged TPO where adhesion of water-based coatings is desired.
       2. Application Rate: 0.25 gallon per 100 sq.ft. (1.01 liters per 10 sq.m.).
       3. Application Method: Brush, roller, or sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: Approximately 15 minutes at 75 degrees F (24 degrees C), with 50 percent RH.

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

* 1. PRIMERS AND SEALANTS FOR LIQUID-APPLIED ROOFING OVER METAL SUBSTRATES

\*\* NOTE TO SPECIFIER \*\* Delete product options not required.

* + 1. Primer, Basis of Design: XR-2000 Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: White, water-based adhesion promoting primer designed to enhance the adhesion of the liquid applied roofing system to pre-finished metal roofing, including those containing fluoropolymers such as KYNAR or siliconized polyesters.
       2. Test suitability of XR-2000 Primer prior to application.
       3. Application Rate: 0.75 gallon per 100 sq.ft. (3.05 liters per 10 sq.m.).
       4. Application Method: Roller or airless sprayer.
       5. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       6. Dry Time: Approximately 6 hours at 75 degrees F (24 degrees C), with 50 percent RH.
    2. Primer, Basis of Design: Acrylex 400 Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: 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.
       2. Application Rate: 0.33 to 0.50 gallon per 100 sq.ft. (1.34 to 2.04 liters per 10 sq.m.) depending on substrate, surface, and porosity.
       3. Application Method: Brush, roller, or conventional or airless sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: 20 to 30 minutes at 75 degrees F (24 degrees C), with 50 percent RH.
    3. Primer, Basis of Design: StableRust Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: Water-based acrylic primer for metal to stabilize and protect metal surfaces.
       2. Application Rate: 0.33 to 0.50 gallon per 100 sq.ft. (1.34 to 2.04 liters per 10 sq.m.).
       3. Application Method: Brush, roller, or sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time, To Touch: 20 to 30 minutes at 75 degrees F (24 degrees C).
       6. Dry Time, To Coat: 1 hour at 75 degrees F (24 degrees C).
    4. Primer, Basis of Design: Lock-Down Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: 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.
       2. Application Rate: 0.25 to 0.33 gallon per 100 sq.ft. (1.02 to 1.34 liters per 10 sq.m.).
       3. Application Method: Roller or airless sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time, To Touch: Approximately 1 hour at 75 degrees F (24 degrees C).
       6. Dry Time, To Cure: Approximately 12 hours at 75 degrees F (24 degrees C).
    5. Primer, Basis of Design: UniBase Primer; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: A low viscosity, highly penetrating, advanced acrylic polymer adhesive and primer designed to act as a bonding primer to enhance the adhesion over built-up, granulated cap sheets, modified bitumen roofing, concrete or previously coated surfaces, also acting as an excellent asphalt bleed blocker.
       2. Application Rate: 0.50 to 1.0 gallon per 100 sq.ft. (2.03 to 4.08 liters per 10 sq.m.).
       3. Application Method: Brush, roller, or sprayer.
       4. Application Temperature, Air and Surface: 50 to 110 degrees F (10 to 43 degrees C).
       5. Dry Time: 1 to 2 hours at 70 degrees F (21 degrees C), with 50 percent RH.
    6. Sealant, Basis of Design: FlexSeal Sealant; as manufactured by GAF, Commercial Roofing Products Division.
       1. Description: 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 degrees F (4.4 degrees C).
       2. Application Rate: 2.0 gallon per 200 linear feet with a 6 inch width (7.6 liters per 61 linear meters with a 152 mm width), typically requires 2 coats.
       3. Application Method: Roller or airless sprayer.
       4. Application Temperature, Air and Surface: 20 to 120 degrees F (minus 6.6 to 49 degrees C).
       5. Dry Time: Approximately 24 hours at 75 degrees F (24 degrees C), with 50 percent RH.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly constructed and prepared.
      2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.

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

* 1. PREPARATION FOR LIQUID-APPLIED ROOFING OVER NON METAL SUBSTRATES
     1. Clean surfaces thoroughly prior to installation. Clean in accordance with coating manufacturer's recommendations for substrate.
     2. Conduct adhesion test as required by manufacturer.
     3. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
     4. Moisture Survey: Perform a moisture survey on the roof system to determine the suitability of the existing roof for application of the coating system. Any wet or deteriorated areas shall be removed and replaced.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is for installation over membrane substrate. Delete if not required.

* + 1. Treatment of Damaged or Deteriorated Membrane: Repair any areas where membrane is torn, cracked and/or buckled using similar or compatible products manufactured by GAF. Replace any wet insulation as part of the roofing repair. Allow 24 hours drying time before application of other coating products.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is for application over corrugated structural transite panels. Delete if not required.

* + 1. Corrugated structural transite panels may contain asbestos. Follow all applicable local, state and federal regulations concerning asbestos.

\*\* NOTE TO SPECIFIER \*\* Two paragraphs below are for application over polyisocyanurate substrates. Delete if not required.

* + 1. For recover over an existing roof, one layer of polyisocyanurate is required.
    2. For new construction or tear-off, one layer of 1.5 inch (38 mm) thick polyisocyanurate and a minimum 1/4 inch (6.4 mm) gypsum roof board, or two layers of fully adhered and staggered polyisocyanurate are required.

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

* + 1. For mechanically attached substrates, plates must be encapsulated with Butter Grade Flashing.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is for installation over roof board. Delete if not required.

* + 1. Minimum thickness of roof board is 1/2 inch (13 mm).

\*\* NOTE TO SPECIFIER \*\* Paragraph below is for recoating existing HydroStop PremiumCoat system. Delete if not required.

* + 1. Inspect existing roof coating system to determine eligibility for recoat.
    2. Treatment of Ponding Water Areas: Make every effort to mechanically eliminate all ponding water areas on the roof prior to application of coating products. Ponding water is defined as water that does not properly drain and remains on the roof for more than 48 hours after precipitations stops.
    3. Deteriorated Seams: Repair all delaminated or open seams using method acceptable to the manufacturer.
    4. Pitch Pans: Cap with sheet metal so they may be sealed with coating products.
    5. 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.

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

* + 1. Application of Primer: Apply primer recommended by coating manufacturer for substrate.

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

* 1. PREPARATION FOR LIQUID-APPLIED ROOFING OVER METAL SUBSTRATES
     1. Clean surfaces thoroughly prior to installation. Clean in accordance with coating manufacturer's recommendations for substrate.
     2. Conduct adhesion test as required by manufacturer.
     3. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
     4. Sheet Metal Crickets: Install sheet metal crickets according to manufacturer's specifications on the high side of all curb units.
        1. Cut vertical ribs 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.
        2. Treat cut ribs in same fashion as a void larger than 1/4 inch (6 mm).
        3. Seal new crickets by placing continuous bead of recommended sealant under the flanges before they are mechanically attached to the curb unit and metal roof panel.
        4. Stitch-screw cricket flanges to the curb unit and metal roof panel while sealant is wet, using fasteners.
     5. Treatment of Ponding Water Areas: Make every effort to mechanically eliminate all ponding water areas on the roof prior to application of coating products. Ponding water is defined as water that does not properly drain and remains on the roof for more than 48 hours after precipitations stops.
     6. Repair dented or damaged metal roof panels:
        1. Mechanically remove dents to the maximum extent possible.
        2. If ribs are broken, cover the broken rib area with a sheet metal cap.
        3. Seal sheet metal rib caps to the roof by applying manufacturer's recommended flashing over the entire broken rib area to be capped prior to attaching the cap with fasteners.
        4. Seal all newly created rib cap seams and fasteners.
        5. Remove and replace roof panels that are severely damaged prior to application of liquid applied roofing system.
     7. Re-tighten, secure, or replace all fasteners as necessary.
        1. Replace all stripped fasteners with larger diameter fasteners, and re-secure the area by adding a new fastener next to the one that was stripped.
        2. Replace all missing fasteners.
        3. Fastening pattern may require modification to facilitate proper installation of the system.
     8. Pressure wash metal substrates with water, minimum working pressure of 3,000 psi (20 MPa), to remove all delaminating paint and coatings dirt, dust, and waste products.
        1. Use Roto-spray tip to expedite metal panel cleaning.
        2. Completely remove all existing silicone-based sealants.
        3. Use sand injection system as required.
        4. Use bleach solution to remove living organisms such as algae, mold, or fungus.
     9. 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.
        1. 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 0.003 inches (0.08 mm) over an area greater than 1 square foot (0.1 square meter).
        2. Coat residual asphalt with manufacturer's recommended primer.
     10. Remove all loose, flaking or powdery rust by wire brushing if it has not been removed during the pressure washing.
         1. Use appropriate primer prior to coating.
         2. Replace roof panels which are corroded to the point where holes are present.
     11. Where roof panel surfaces are known or suspected to contain fluoropolymers, prepare test patches with and without the use of XR-2000 Primer. Apply XR-2000 Primer on pre-finished metal panels where indicated by test patch results.
     12. Pitch Pans: Cap with sheet metal so they may be sealed with coating products.
     13. Neoprene Pipe Boots: Install neoprene boots prior to flashing work being performed for pipe penetrations when recommended by manufacturer. Neoprene boots shall be sealed to the roof using a bead sealant prior to mechanical attachment with fasteners.
     14. Open Ridge Vents: Replace open ridge vents or install sheet metal caps over vents where rusted on the inside or located in a harsh environment.
         1. Do not seal weep holes on the vents.
     15. 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.
     16. Deteriorated Seams and Cracks: Apply flashing and fabric to delaminated or open seams in 3-course installation.

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

* 1. INSTALLATION FOR LIQUID-APPLIED ROOFING OVER NON-METAL SUBSTRATES
     1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
        1. 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.
        2. If there will be an extended period of time (6 months or greater) between application of base and finish coats, the base coat shall be thoroughly cleaned before applying the finish coat.
        3. Walkways designed for metal roofing systems shall be installed in all high traffic areas.
     2. Flashing Application:
        1. After completion of substrate preparation, flash all flashing details, penetrations and curbs per manufacturer's recommendations, so that water may flow over the various flashing details.
        2. Parapet Walls: Secure all parapet wall details within the roof system and seal with 12 inches (305 mm) minimum width of manufacturer's recommended flashing. Fill all voids and open areas with polyurethane foam prior to application of flashing membrane.
        3. Curb Flashings: Flash all curb flashings, including cricket details, with 12 inches (305 mm) minimum width of manufacturer's recommended flashing. Encapsulate all fasteners. Do not bridge fasteners. Cut fabric around all fasteners so that fabric lies flat.
        4. Penetrations: Apply flashing around the base of the penetration extending at least 6 inches (152 mm) onto the vertical and 6 inches (152 mm) onto the base. Embed 12 inches (305 mm) width of fabric using additional flashing as necessary. Cut the fabric to accommodate the shape of the penetration. Both the top and bottom of neoprene pipe boots shall be flashed.
        5. Skylights: Treat curb skylights in the same fashion as curb flashings. After flashing work has been completed and the coating has cured, treat deteriorated fiberglass skylight panels with sealer.
        6. Gutters: Trowel or brush apply sealant to the interior or exterior gutter incorporating 12 inches (305 mm) fabric at all gutter seams. Gutter shall be completely clean and dry before applying sealant

\*\* NOTE TO SPECIFIER \*\* Contact the GAF's Technical Service Department for information.

* + - 1. Ponding Water Areas: The severity of the ponding water condition will determine the requirements for additional preparation.
      2. Inspect preliminary work and flashing details for problem areas, such as gaps, cracks, fishmouths, and air pockets, to ensure that work is complete and satisfactory.
    1. Coating Application:

\*\* NOTE TO SPECIFIER \*\* Paragraph below is required for some 15 or 20 year warranty systems. Delete if not required.

* + - 1. Treat seams as required by manufacturer for indicated warranty.

\*\* NOTE TO SPECIFIER \*\* Next two paragraphs below are for application over concrete substrates. Delete if not required.

* + - 1. Treat structural joints with backer rod and compatible sealant, then treat with flashing membrane and fabric.
      2. Seal control joints greater than 1/16 inch (1.6 mm) with compatible sealant.

\*\* NOTE TO SPECIFIER \*\* Paragraph below is for installation over corrugated transite panel substrate. Delete if not required.

* + - 1. Treat transite gaps in excess of 1/16 inch (1.6 mm) with compatible sealant.
      2. Apply foundation coat at rate required by manufacturer for indicated warranty.
      3. Apply finish coats at rate required by manufacturer for indicated warranty.
      4. Allow at least 24 hours of drying time after application of each coat, then inspect and correct any unsatisfactory conditions.

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

* 1. INSTALLATION FOR LIQUID-APPLIED ROOFING OVER METAL SUBSTRATES
     1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
        1. Take special care when installing dark colors.
        2. Always spray wet material to wet material to ensure spray lines do not appear.
        3. 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.
        4. If there will be an extended period of time (6 months or greater) between application of base and finish coats, the base coat shall be thoroughly cleaned before applying the finish coat.
        5. Walkways designed for metal roofing systems shall be installed in all high traffic areas.
     2. Flashing Application:
        1. After completion of substrate preparation, flash all flashing details, penetrations and curbs per manufacturer's recommendations, so that water may flow over the various flashing details.
        2. Rakes: Secure and seal fixed rake details with 12 inches (305 mm) minimum width of manufacturer's recommended flashing. Where fixed rake is fastened to top of roof panel ribs and extends back into the roof, trim off excess metal and follow horizontal seam flashing procedures. Fill all voids and open areas with polyurethane foam.

\*\* NOTE TO SPECIFIER \*\* Contact GAF's Technical Services Department for more information on installation over standing seam roof panels.

* + - 1. Parapet Walls: Secure all parapet wall details within the roof system and seal with 12 inches (305 mm) minimum width of manufacturer's recommended flashing. Fill all voids and open areas with polyurethane foam prior to application of flashing membrane.
      2. Curb Flashings: Flash all curb flashings, including cricket details, with 12 inches (305 mm) minimum width of manufacturer's recommended flashing. Encapsulate all fasteners. Do not bridge fasteners. Cut fabric around all fasteners so that fabric lies flat.
      3. Penetrations: Apply flashing around the base of the penetration extending at least 6 inches (152 mm) onto the vertical and 6 inches (152 mm) onto the base. Embed 12 inches (305 mm) width of fabric using additional flashing as necessary. Cut the fabric to accommodate the shape of the penetration. Both the top and bottom of neoprene pipe boots shall be flashed.
      4. Skylights: Treat curb skylights in the same fashion as curb flashings. After flashing work has been completed and the coating has cured, treat deteriorated fiberglass skylight panels with sealer.
      5. Gutters: Trowel or brush apply sealant to the interior or exterior gutter incorporating 12 inches (305 mm) fabric at all gutter seams. Gutter shall be completely clean and dry before applying sealant

\*\* NOTE TO SPECIFIER \*\* Contact the GAF's Technical Service Department for information.

* + - 1. Ponding Water Areas: The severity of the ponding water condition will determine the requirements for additional preparation.
    1. Coating Application:
       1. Treat seams as required by manufacturer for indicated warranty.
       2. Apply primer recommended by coating manufacturer for substrate.
       3. Encapsulate exposed fasteners with Butter Grade Flashing and fabric.
       4. Apply foundation coat at rate required by manufacturer for indicated warranty.
       5. Apply finish coats at rate required by manufacturer for indicated warranty.
       6. Allow at least 24 hours of drying time after application of each coat, then inspect and correct any unsatisfactory conditions.
  1. FIELD QUALITY CONTROL
     1. 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 coating membrane.
     2. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.
        1. Inspect Preliminary Work and Flashing Details for problem areas, such as gaps, cracks, fishmouths, and air pockets, to ensure that work is complete and satisfactory.
        2. Inform Architect and manufacturer's Field Services Department when all preliminary work and flashing details will be complete and the Installer is ready to proceed with application of roof coating. Allow a minimum of two weeks for the interim inspection to be made by the manufacturer's Field Services Department.

\*\* NOTE TO SPECIFIER \*\* Be advised that Technical On-Site Support for instructing Certified Contractors in the proper application of the roofing systems 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 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. Any final roofing installation prior to this interim inspection is subject to rejection by the Architect and manufacturer's Field Services Department.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
    2. Provide the following support for on-site inspections by a representative from manufacturer'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. Products and application equipment required to repair roof areas where destructive tests are to be performed by manufacturer's Field Services Department.
  1. CLEANING AND PROTECTION
     1. Clean products in accordance with the manufacturer's recommendations.
     2. Touch-up, repair or replace damaged products before Substantial Completion.
        1. Damaged areas are to be cut, cleaned and dried.
        2. Apply flashing or coating with bulking agent, and feather out onto the existing membrane.
        3. If a new penetration area has been cut, embed fabric into the flashing coating with bulking agent according to standard specifications.
        4. Once the flashing has cured, finish coat may be applied for aesthetic uniformity.

END OF SECTION