SECTION 07563

FLUID APPLIED ROOFING RESTORATION

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\*\* NOTE TO SPECIFIER \*\* Garland Company, Inc. (The); Fluid applied roof restoration products.  
.  
This section is based on the products of Garland Company, Inc. (The), which is located at:  
3800 E. 91st St.  
Cleveland, OH 44105  
Toll Free Tel: 800-321-9336  
Tel: 216-641-7500  
Fax: 216-641-0633  
Email:[request info ()](http://admin.arcat.com/users.pl?action=UserEmail&company=Garland+Company,+Inc.+(The)&coid=32695&rep=&fax=216-641-0633&message=RE:%20Spec%20Question%20(07563gar):%20%20&mf=)  
Web:<http://www.garlandco.com>  
  
[[Click Here](http://www.arcat.com/arcatcos/cos32/arc32695.html)] for additional information.  
  
Garland offers a complete range of coatings that enhance, restore, and repair your roofing systems. Our coatings are designed for use with single-ply, BUR, modified bitumen, and metal substrates for a variety of slope configurations. We also offer a complete range structural standing seam metal roofing systems, metal trim, termination, and flashing systems, as well as fully integrated wall systems.  
  
This section includes system description for a White-Knight Plus fluid-applied, partially reinforced modified bitumen restoration system. Consult your local Garland Representative for recommendations on each system component.

1. GENERAL
   1. SECTION INCLUDES
      1. Smooth Surface or Mineral Modified Roof Restoration (1.4.D)(2.5)
   2. RELATED SECTIONS

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

* + 1. Section 06100 - Rough Carpentry: Roof blocking installation and requirements.
    2. Section 07620 - Sheet Metal Flashing and Trim: Metal cap flashing and expansion joints.
    3. Section 07620 - Sheet Metal Flashing and Trim: Weather protection for base flashings.
    4. Section 07710 - Manufactured Roof Specialties: Counter flashing gravel stops, and fascia, scuppers, gutters and downspouts.
    5. Section 15430 - Plumbing Specialties: Piping vents and roof drains.
  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 C 92 - Standard Test Methods for Sieve Analysis and Water Content of Refractory Materials.
    2. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
    3. ASTM C 1250 - Standard Test Method for Nonvolatile Content of Cold Liquid-Applied Elastomeric Waterproofing Membranes.
    4. ASTM D 5 - Standard Test Method for Penetration of Bituminous Materials.
    5. ASTM D 36 - Standard Test Method for Softening Point of Bitumen.
    6. ASTM D 71 - Standard Test Method for Relative Density of Solid Pitch and Asphalt.
    7. ASTM D 75 - Standard Practice for Sampling Aggregates.
    8. ASTM D 92 - Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.
    9. ASTM D 93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.
    10. ASTM D 113 - Standard Test Method for Ductility of Bituminous Materials.
    11. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
    12. ASTM D 522 – Standard Test Method for Mandrel Bend Test of Attached Organic Coatings
    13. ASTM D 562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
    14. ASTM D 570 – Standard Test Method for Water Absorption of Plastics
    15. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
    16. ASTM D 816 - Standard Test Methods for Rubber Cements.
    17. ASTM D 1370 - Standard Test Method for Contact Compatibility Between Asphaltic Materials (Oliensis Test).
    18. ASTM D 1475 - Standard Test Method For Density of Liquid Coatings, Inks, and Related Products.
    19. ASTM D 1863 - Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
    20. ASTM D 1876 - Standard Test Method for Peel Resistance of Adhesives (T-Peel Test).
    21. ASTM D 2042 - Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene.
    22. ASTM D 2196 - Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield type) Viscometer.
    23. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness.
    24. ASTM D 2369 - Standard Test Method for Volatile Content of Coatings.
    25. ASTM D 3111 - Standard Test Method for Flexibility Determination of Hot-Melt Adhesives by Mandrel Bend Test Method.
    26. ASTM D 3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
    27. ASTM D 4073 – Standard Test Method for Tensile-Tear Strength of Bituminous Roofing Membranes
    28. ASTM D 4209 - Standard Practice for Determining Volatile and Nonvolatile Content of Cellulosics, Emulsions, Resin Solutions, Shellac, and Varnishes.
    29. ASTM D 4212 - Standard Test Method for Viscosity by Dip-Type Viscosity Cups.
    30. ASTM D 4402 - Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer.
    31. ASTM D 4479 - Standard Specification for Asphalt Roof Coatings - Asbestos-Free.
    32. ASTM D 5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
    33. ASTM D 5602 – Standard Test Method for Static Puncture Resistance of Roofing Membrane Specimens
    34. ASTM D 5635 – Standard Test Method for Dynamic Puncture Resistance of Roofing Membrane Specimens
    35. ASTM D 7379 – Standard Test Methods for Strength of Modified Bitumen Sheet Material Laps Using Cold Process Adhesive
    36. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
    37. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
    38. SRI - Solar Reflectance Index calculated according to ASTM E 1980.
    39. South Coast AQMD Standards.
    40. SMACNA Architectural Sheet Metal Manual.
    41. ANSI/SPRI ES-1 - Testing and Certification Listing of Shop Fabricated Edge Metal
    42. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.
  1. SYSTEM DESCRIPTION
     1. Smooth or Mineral Modified Surface Roof Restoration: Renovation work includes:
        1. Surface preparation: Remove dirt, and debris.
        2. Fascia Edges: Cut back edges. Prime, coat with mastic, cover with fabric.
        3. Parapets and Vertical Surfaces: Repair or replace flashing membrane as needed.
        4. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
        5. Roof Repairs: Repair blisters, stressed, deteriorated or cracked membrane.
        6. Primer: Prime over new asphaltic materials only.
        7. Install base coating and fabric reinforcement on seams, flashings and around penetrations / let cure / install second base coat over entire roof surface. Let cure, and top coat flashings and entire roof surface.
  2. SUBMITTALS
     1. Submit under provisions of Section 01300.
     2. Product Data: Manufacturer's data sheets on each product to be used, including:
        1. Preparation instructions and recommendations.
        2. Storage and handling requirements and recommendations.
        3. Installation methods.
     3. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable.

* + 1. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
       1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
       2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
       3. Product reflectivity and emissivity criteria to qualify for one point under the LEED credit category, Credit 7.2, Landscape & Exterior Design to Reduce Heat Island - Roof.
    2. Verification Samples: For each product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, and color.
    3. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
    4. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.
  1. QUALITY ASSURANCE
     1. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
     2. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.
     3. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
     4. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
     5. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
     6. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
  2. PRE-INSTALLATION CONFERENCE
     1. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.
     2. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.
     3. Objectives include:
        1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
        2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
        3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
        4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
        5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
        6. Review required inspection, testing, certifying procedures.
        7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
        8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.
  3. DELIVERY, STORAGE, AND HANDLING
     1. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
     2. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
     3. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
     4. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
     5. Storage temperatures should be between 60°F to 80°F (15.6° to 26.7°C) and not exceed 110°F (43.3°C). Indoor ventilated storage is recommended Ensure jobsite storage is in a shaded and ventilated area. Do not store in direct sunlight. Keep materials away from open flame or welding sparks
  4. PROJECT CONDITIONS
     1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
     2. Weather Condition Limitations: Do not apply roofing system during inclement weather or when precipitation is expected.
     3. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
     4. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
     5. When applying materials with spray equipment, take precautions to prevent over spray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
        1. Close air intakes into the building.
        2. Have a dry chemical fire extinguisher available at the jobsite.
        3. Post and enforce "No Smoking" signs.
     6. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.
     7. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.
     8. Take precautions to ensure that materials do not freeze.
     9. Minimum temperature for application is 50 degrees F (10 degrees C) and rising
     10. \*\* NOTE TO SPECIFIER \*\* Select the warranty required for the system specified from the following paragraphs and delete those not required. Various Garland warranties are available. Warranties range from limited materials warranties to limited materials and labor warranties with options for extending the term up to 15 years with required 5 year inspections.
  5. WARRANTY
     1. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
        1. Warranty Period:
           1. 5 plus 5 plus (10 years): 5 years from date of acceptance plus 5 additional years after 5 year inspection by Garland.

\*\* NOTE TO SPECIFIER \*\* Installer warranties are recommended and are becoming more common. Such warranties generally ensure a more vested interest in the integrity of the installation. Two-year installer warranties are standard, but you may wish to increase the time period below.

* + 1. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
       1. Warranty Period:
          1. 2 years from date of acceptance.

1. PRODUCTS
   1. MANUFACTURERS
      1. Acceptable Manufacturer: Garland Company, Inc. (The), which is located at: 3800 E. 91st St.; Cleveland, OH 44105; Toll Free Tel: 800-321-9336; Tel: 216-641-7500; Fax: 216-641-0633; Email:[request info ()](http://admin.arcat.com/users.pl?action=UserEmail&company=Garland+Company,+Inc.+(The)&coid=32695&rep=&fax=216-641-0633&message=RE:%20Spec%20Question%20(07563gar):%20%20&mf=); Web:<http://www.garlandco.com>
      2. Requests for substitutions will be considered in accordance with provisions of Section 01600.
   2. ROOF RESTORATION SYSTEM FOR SMOOTH OR MINERAL MODIFIED SURFACE ROOFS
      1. White-Knight Plus System:
         1. Primer: Garla-Block on new asphaltic materials only
         2. Base Coating: White-Knight Plus Base & White-Knight Plus
         3. Coating: White-Knight Plus Base & White-Knight Plus
         4. Flashing: Repair or replace as needed. White-Knight Plus Base & White-Knight Plus
         5. Reinforcement: Grip Polyester Soft or Ulti-Mat self-adhered tape
         6. Surfacing: None.

\*\* NOTE TO SPECIFIER \*\* This section includes product requirements for Edge Treatments and Roof Penetration Flashings. Coordinate with the installation requirements specified under Installation and with Garland's Standard Flashing Details.

* 1. EDGE TREATMENT AND ROOF PENETRATION FLASHINGS
     1. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
     2. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.
     3. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
     4. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
     5. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.
     6. Liquid Flashing - Coating: White-Knight Plus or White-Knight Plus Base: Multi-purpose, 100% solids, two-part, fast-cure, polyurea
     7. \*\* NOTE TO SPECIFIER \*\* The following paragraphs include references to material requirements specified in other Sections of the specifications. The subparagraph includes references to details promulgated by SMACNA, NRCA, and CDA. These details are likely to be used by Design Professionals on their Drawings and Specifications. Specifier should coordinate the Design Professional's Specification requirements and Drawing Details with the Garland's Standard Flashing Details. Edit as required to suit the project.
     8. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
        1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
     9. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
        1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

1. EXECUTION
   1. EXAMINATION
      1. Do not begin installation until substrates have been properly prepared.
      2. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
      3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
   2. ROOF PREPARATION AND REPAIR
      1. General: All necessary field and flashing repairs must be done according to good construction practices, including the removal of all wet insulation and defective materials as identified through a moisture detection survey such as an infrared scan and replacement with like-materials.
         1. Remove existing roof flashings from curbs and parapet walls down to the surface of the roof. Remove existing flashings at roof drains and roof penetrations.
         2. Remove all wet, deteriorated, blistered or delaminated roofing membrane or insulation and fill in any low spots occurring as a result of removal work to create a smooth, even surface for application of new roof membranes.
         3. Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
         4. When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
         5. Existing roof surfaces shall be primed as necessary and allowed to dry prior to installing the fluid-applied roofing system.
      2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
      3. Repair all defects such as deteriorated roof decks; replace saturated insulation board, replace loose or brittle membrane or membrane flashings. Verify that exiting conditions meet the following requirements:
         1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
         2. Application of roofing materials over a brittle roof membrane is not recommended.
      4. Remove all loose dirt and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.
      5. Clean and seal all parapet walls, gutters and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope.
      6. Clean the entire roof surface by removing all dirt, algae, paint, oil, talc, rust or foreign substance. Use a 10 percent solution of TSP (tri-sodium phosphate), Simple Green and warm water. Scrub heavily soiled areas with a brush. Rinse with fresh water to remove all TSP solution. Allow roof to dry thoroughly before continuing.
      7. Repair existing roof membrane as necessary to provide a sound substrate for the fluid-applied membrane. All surface defects (cracks, blisters, tears) must be repaired with similar materials.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph if know growth is existing of the existing surfaces. Delete if not applicable.

* + 1. Pre-Treatment of Known Growth - General Surfaces: Once areas of moss, mold, algae and other fungal growths or vegetation have been removed and surfaces have also been thoroughly cleaned, apply a biocide wash at a maximum spread rate of 0.2 gallons/square (0.08 liters/m), to guard against subsequent infection. Allow to dry onto absorbent surfaces before continuing with the application. On non-absorbent surfaces, allow to react before thoroughly rinsing to remove all traces of the solution.
  1. INSTALLATION
     1. General Installation Requirements:
        1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness required by the manufacturer.
        2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
        3. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
        4. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
        5. All primers must be top coated within 24 hours of application. Re-prime if more time passes after priming.
        6. Keep roofing materials dry during application.
        7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
        8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.
     2. Smooth Surface or Mineral Modified Roof Restoration: Renovation work includes:
        1. Surface preparation: Remove dirt, and debris.
        2. Fascia Edges: Cut back edges. Prime, coat with mastic, cover with membrane.
        3. Parapets and Vertical Surfaces: Cut back and replace damaged flashing membrane as required.
        4. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
        5. Roof Repairs: Repair blisters, holes, cuts, cracks, splits or other surface defects. Loose or damaged modified bitumen laps must be resealed/repaired.
        6. Primer: Prime new asphaltic materials only at a rate of 0.5 gallons per 100 SF.
        7. Field/Flashing Seams and Details**:(Select one of the two reinforcement system paragraphs and delete the other)**
           1. Application of White-Knight Plus Base or White-Knight Plus and Reinforcement

Verify that the surface to be coated is properly prepared.

Restore the surface to a suitable condition if roof surface becomes contaminated with dirt, dust or other materials that will interfere with adhesion of the coatings.

Apply reinforcement to field seams and penetrations as required.

After positioning reinforcement to roll out, apply White-Knight Plus in about 8 inches wide to surface where reinforcement ply is to be applied at 3.0 gallons per 100 SF.

Do not apply coating too far ahead of fabric so coating does not dry before fabric can be embedded.

Immediately roll a 6 inch width of reinforcement into wet coating and completely saturate surface ensuring full encapsulation of fabric without pinholes, voids, openings or vertical fibers.

Use care to lay the fabric tight to the roof surface without air pockets, wrinkles, fishmouths, etc.

After embedding reinforcement into the coating apply additional coating to completely saturate the fabric by immediately rolling over reinforcement surface with a roller.

Apply saturation coat as soon as possible after embedding reinforcement into the coating.

Keep the application saturated with coating to prevent plucking or snagging of reinforcement.

Allow to dry for a minimum of 24 hours before applying subsequent coating layers.

* + - * 1. Application of UniBond ST tape

Verify the surface is clean and properly prepared.

Remove clear release liner from the back in workable sections.

Center 6 inch wide Unibond ST over the middle of lap. For other details requiring reinforcement such as drains, penetrations and curbs, use 12 inch wide UniBond ST.

Use care to install tape uniformly. Do not stretch or cause air pockets, wrinkles or fishmouths.

Apply pressure to tape starting at the center and work toward outside edge with a steel roller to activate the bonding process.

Inspect tape to ensure that it is properly installed. Verify edges are tightly fixed to surface. If any discrepancies are present, they must be repaired before the coating is applied.

After installing UniBond ST, saturate the tape’s polyester surface with White-Knight Plus or White-Knight Plus Base coating and allow to dry.

* + - 1. Application of Base Coat
         1. Apply a base coating of White-Knight Plus Base or White-Knight Plus in a uniform manner at minimum application rate of 2.0 gal. /100 sq. ft. over the entire roof surface, including all flashings. Use a ¼” notched squeegee to spread coating and roller apply for uniform minimum coverage. Allow to cure thoroughly, but no more than 72 hours.
      2. Application of Top Coat:
         1. Apply a top coating of White-Knight Plus Base or White-Knight Plus in a perpendicular direction over the base coat at 1.5 gal./100 sq. ft. for smooth modified bitumen or 2.0 gal./100 sq. ft. for granule modified bitumen.
      3. Liquid Flashings:
         1. All flashings are coated in the same manner as the field prior to field application.
         2. Vertical liquid flashings shall run a minimum of 4” onto the horizontal surface
      4. (Optional): Application of Non-Skid Surface for Walkways
         1. Apply White-Knight Plus at a minimum of 1.0 gal./100 sq. ft. (0.41 l/m2) to dry top coat within 72 hours of its application.
         2. Broadcast dry roofing granules or 20-40 mesh silica sand into wet coating and immediately back-roll to set.
  1. INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

\*\* NOTE TO SPECIFIER \*\* The following two paragraphs include references to material requirements specified in other Sections of the specifications. The related subparagraphs includes references to details promulgated by SMACNA, NRCA, and CDA. Note that these details are likely to be used by Design Professionals on their Drawings and Specifications. The Specifier should coordinate the Design Professional's Specification requirements and Drawing Details with the Garland's Standard Flashing Details.  
1- If the Design Professional's details have been coordinated to Garland's Standard Flashing Details retain the following two paragraphs and subparagraphs and delete the references to Garland's Standard Flashing Details.  
2- If Garland's Standard Flashing Details are to be used, retain the following two primary paragraphs and delete both subparagraph references to SMACNA etc.

* + 1. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
       1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.
    2. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are provided as specified in Section 07710.
       1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractor's Association "Roofing and Waterproofing Manual" as applicable.
    3. Metal Edge:
       1. Inspect the nailers to assure proper attachment and configuration.
       2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
       3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
       4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
       5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
       6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.
       7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Seal outside edge with rubberized cement.
  1. CLEANING
     1. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
     2. Remove asphalt markings from finished surfaces.
     3. Repair or replace defaced or disfigured finishes caused by Work of this section.
  2. PROTECTION
     1. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
     2. Protect exposed surfaces of finished walls with tarps to prevent damage.
     3. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
     4. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
     5. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraphs to specify requirements for inspection and testing by the manufacturer. Delete if not required for project.

* 1. FIELD QUALITY CONTROL
     1. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system.
     2. Perform field inspection and [and testing] as required under provisions of Section 01410.
     3. Correct defects or irregularities discovered during field inspection.
  2. FINAL INSPECTION

\*\* NOTE TO SPECIFIER \*\* Modify the following paragraph to only include those parties involved in the project.

* + 1. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.
    2. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.
    3. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.
    4. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
    5. Advise architect upon completion of corrections.
    6. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.
  1. PROTECTION
     1. Protect installed products until completion of project.
     2. Touch-up, repair or replace damaged products before Substantial Completion.
  2. SCHEDULES
     1. Primers:
        1. Garla-Block Primer: copolymer sealant that prevent staining and degradation of surface coatings when installed over smooth or granulated asphalt, coal tar modified bitumen, or smooth asphalt BUR membranes.
           1. Non-Volatile Solids % by Weight, ASTM 3960: 28-32 %
           2. Non-Volatile Solids % by Volume, ASTM 3960: 25-28 %
           3. pH: 8-10
           4. Wet Film Thickness @ 1 gal./100 sq. ft.: 16 mils (microns 406.4)
           5. Flash Point PMCC: None
           6. Drying Time, Touch @ 70 degrees F (21.1 degrees C) /50% R.H.: 1-2 hrs.
           7. Viscosity @ 77 degrees F (25 degrees C) Brookfield RVT, #4 Spindle; 20 rpm, ASTM 2196: 3000-5000 cPs
           8. VOC: 30 g/l max
     2. Base Coatings:
        1. White-Knight Plus Base: Highly reflective multi-purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
           3. Elongation: ASTM D 412, 320%
           4. Density @ 77° F (25° C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
           5. Flash Point: ASTM D 93, 110°F min. (43°C)
           6. Non-Volatile: ASTM D 75, Typical 83%
           7. Viscosity @ 77° F (25° C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 225 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110
        2. White-Knight Plus WC Base: highly reflective multi-purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane. VOC compliant and meets South Coast AQMD standards.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
           3. Elongation: ASTM D 412, 320%
           4. Density @ 77° F (25° C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
           5. Flash Point: ASTM D 93, 110°F min. (43°C)
           6. Non-Volatile: ASTM D 75, Typical 83%
           7. Viscosity @ 77° F (25° C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 50 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110
     3. Reinforcement
        1. Grip Polyester Soft: Strong, elastic polyester reinforcing fabric.
        2. UniBond ST: Fatigue resistant, polyester-faced adhesive tape.
     4. Coating:
        1. White-Knight Plus WC: highly reflective multi- purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane. VOC compliant and meets South Coast AQMD standards.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
           3. Elongation: ASTM D 412, 320%
           4. Density @ 77° F (25° C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
           5. Flash Point: ASTM D 93, 110°F min. (43°C)
           6. Non-Volatile: ASTM D 75, Typical 83%
           7. Viscosity @ 77° F (25° C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 50 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110
        2. White-Knight Plus/White-Stallion Plus: Highly reflective multi- purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
           3. Elongation: ASTM D 412, 320%
           4. Density @ 77° F (25° C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
           5. Flash Point: ASTM D 93, 110°F min. (43°C)
           6. Non-Volatile: ASTM D 75, Typical 83%
           7. Viscosity @ 77° F (25° C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 225 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110
     5. Flashings
        1. White-Knight Plus/White-Stallion Plus Base: White-Knight Plus/ White-Stallion Plus Base: Highly reflective multi-purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
           3. Elongation: ASTM D 412, 320%
           4. Density @ 77° F (25° C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
           5. Flash Point: ASTM D 93, 110°F min. (43°C)
           6. Non-Volatile: ASTM D 75, Typical 83%
           7. Viscosity @ 77° F (25° C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 225 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110
        2. White-Knight Plus WC Base: highly reflective multi-purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane. VOC compliant and meets South Coast AQMD standards.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
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           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 50 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110
        4. White-Knight Plus/White-Stallion Plus: Highly reflective multi- purpose, single-component, moisture-triggered aliphatic urethane, liquid waterproofing membrane.
           1. Tensile Strength: ASTM D 412, 2100 psi
           2. Tear Resistance: ASTM D 624, 160 lbs./in
           3. Elongation: ASTM D 412, 320%
           4. Density @ 77° F (25° C, ASTM D 2939) 10.4 lb./gal (1.2 g/m3)
           5. Flash Point: ASTM D 93, 110°F min. (43°C)
           6. Non-Volatile: ASTM D 75, Typical 83%
           7. Viscosity @ 77° F (25° C); Brookfield RVT, #4 Spindle 10 rpm9200 cP
           8. Wet Film Thickness@ 2 gal./100 sq. ft. (0.82 l/m2)
           9. VOC: 225 g/l
           10. Reflectance: 0.87
           11. Emittance: 0.89
           12. SRI: 110

END OF SECTION