

SECTION 075703 – COATED ORGANIC EPOXY RESIN RESTORATION SYSTEM

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Elastomeric roof coatings.

1.2 PERFORMANCE REQUIREMENTS

- A. Watertightness: Provide coated roofing that is watertight and will not permit the passage of water.
- B. Material Compatibility: Provide elastomeric coatings, and miscellaneous roofing materials that are compatible with one another and able to bond to substrate under conditions of service and application required, as demonstrated by coated roofing manufacturer based on testing and field experience.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties.
- B. Samples for Initial Selection: For roof coating colors.
- C. Maintenance Data: For coated roofing to include in maintenance manuals.
 - 1. Two electronic copies, one to WRECORP and one to owner.
- D. Warranty: Sample of special warranty complying with section 1.7.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: A licensed contractor that holds a minimum K-42 and or L-42 license in the State of Arizona for a minimum 10 years. A qualified contractor who is approved applicator by roof coating manufacturer for installation of warranted manufacturer's product over existing roof systems.
 - 1. Applicators and Workers: Shall have the following accreditations prior to commencing any work on the project.
 - a. Fulfilled requirements of a minimum four hour manufacturer accreditation for all personnel assigned to work on Project. Receive and carry at all times manufacturer's certificate with matching photograph.
 - b. Fulfilled minimum 10 hour OSHA fall protection for all personnel assigned to work on project. Receive and carry at all times certificate of completion.
- B. Manufacturer Assurance: A manufacturer's representative shall visit the project a minimum of once a week and shall submit a report to the consultant each week detailing contractor's compliance with specification and manufacturer's requirements.

1. Manufacturer shall perform an adhesion test on roof surface prior to application of coating system.
 2. Manufacturer shall issue a report stating that the adhesion test results were acceptable for system specified.
- C. Source Limitations: Obtain coating products from single coating manufacturer.
- D. Pre-installation Conference: Conduct conference at Project site.
1. Review methods and procedures related to coated roofing including, but not limited to, the following:
 - a. Construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - b. Certifying procedures.
 - c. Surface preparations.
 - d. Minimum curing period.
 - e. Forecasted weather conditions.
 - f. Application procedures.
 - g. Testing and inspection procedures.
 - h. Protection and repairs.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, shelf life, and directions for storing and mixing with other components. Provide all information from manufacturer with shipping documents.
- B. Store materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by manufacturer. Protect stored materials from direct sunlight. Storage is the responsibility of the contractor.
- C. Remove and replace material that cannot be applied within its stated shelf life.

1.6 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing work to be performed according to coated roofing manufacturer's written instructions and warranty requirements.
 1. Apply materials within the range of ambient and substrate temperatures recommended by roofing material manufacturers, but not below 50 deg F.
 2. Apply materials within range of relative humidity recommended by manufacturer of each component, but not when relative humidity exceeds 85 percent, nor when temperatures are less than 5 deg F above dew point.
 3. Do not apply materials to damp or wet surfaces.
 4. Do not apply coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period.
 5. Do not apply coatings when wind conditions prevent uniform coating application or containment of overspray.

1.7 WARRANTY

- A. Special Warranty: Coated roofing manufacturer's warranty form in which manufacturer agrees to warranty all labor and components of the coating system and to repair or replace coated roofing system that does not comply with requirements or that does not remain watertight within specified warranty period.
 - 1. Additional Warranty Requirements to be stated on the warranty form.
 - a. Coating system shall not blister, scale, peel or crack.
 - b. Top white coating shall not degrade to less than 15 mils during the warranted period.
- B. Warranty Period: 20 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 COATINGS

- A. Epoxy Resin Coating: Liquid epoxy resin coating system, non-toxic, VOC/BPA free, environmentally benign, and designed to adhere to cementitious coatings.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Oak Ridge
 - b. Or equal
 - 2. Product: All Cote
 - 3. Solids by Volume: 100%
 - 4. Elongation: 100%
 - 5. Tensile Strength: 900 psi
- B. Acrylic Coatings: Liquid acrylic elastomeric coating system, specifically formulated for coating roofing.
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Oak Ridge
 - b. Or equal
 - 2. Product: Super Coat ARW
 - 3. Topcoat Color: White.
 - 4. Solids by Volume: 52% or greater
 - 5. Elongation at Break: 200% or greater
 - 6. Tensile Strength: 300 psi or greater

2.2 VAPOR VENTS

- A. One way vapor vents.

2.3 POLYESTER FABRIC

- A. Polyester Fabric: Tietex stitch bonded polyester mat.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine existing roof areas and conditions under which coatings will be applied, with Installer and Manufacturer present, for compliance with requirements. Begin installation only after unsatisfactory conditions have been corrected and substrates are dry.

3.2 SURFACE PREPARATION

- A. Clean and prepare substrate removing loose impediments and dust by stiff broom or Power Broom. Provide clean, dust-free, dew-free, and dry substrate for coating application.
- B. Remove grease, oil, asphalt based sealants, and other contaminants from substrate.
- C. Remove all loose coatings as directed by the manufacturer.
- D. Cover and mask adjoining surfaces not receiving coating system to prevent overspray or spillage affecting other construction.
 - 1. Remove masking after coatings have been applied.
- E. Repair all roof system cracks, voids, penetrations and curb corners by 3 coursing with polyester fabric and All Cote. Remove dust and dirt from joints and cracks before applying coatings.
 - 1. All cracks in the roofing system will be U-cut each end of the crack. Each crack shall be covered with polyester fabric 12 inches beyond all directions of the crack and 3 coursed prior to application of the coating system.
- F. Install one way vapor vent per 1,000 square feet of roofing surface, by coring a 3” hole through the roofing system to the deck. Set the one way vents into a bed of sealant and 3 course with polyester fabric and epoxy coatings. Polyester fabric is to be a minimum 24 inches greater diameter than the vapor vent base.
- G. Test substrates for moisture prior to application of coatings.
- H. Secure any loose roofing membrane.

3.3 COATING APPLICATION

- A. Apply coating system to existing roof system, in one or more coats and according to roof coating manufacturer's written instructions, by brush, roller or spray applied method.
- B. Apply minimum one coat All Cote at a rate to achieve 25 mils DFT to obtain a uniform, seamless membrane free of blisters and pinholes.
- C. Acrylic Top Coat Application:
 - 1. Spray apply and back roll base coat at the rate to achieve 25 mils DFT, minimum two applications.

- D. Total dry film thickness (DFT) shall be 50 mils as the system.

3.4 TESTING

- A. The manufacturer shall perform an adhesive test to surface of existing roof system in the presence of the roof consultant prior to any application of the restoration system. Results of testing shall become a matter of record for the project and acceptable to the manufacturer for issuing of warranty.
- B. The manufacturer and consultant will be required to randomly sample the coating application during application and after final coat has been installed and cured. The samples will be slit samples and will be checked for DFT requirements and adhesion.
- C. Contractor will repair all sample areas immediately after they are taken and there will be no additional charge to the client.
- D. Contractor will be required to correct any deficiencies at no charge to the client.

3.5 CURING, PROTECTING, AND CLEANING

- A. Cure coatings according to coating manufacturer's written instructions, taking care to prevent contamination and damage during application stages and curing. Do not permit traffic on uncured coatings.
- B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075703

SECTION 075705 - COATED FOAMED ROOFING – DOUBLE GRANULE APPLICATION TOP LOCK SYSTEM

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Spray-applied, polyurethane foam insulation.
 - 2. Elastomeric roof coatings.
 - 3. Mineral granules.

1.3 PERFORMANCE REQUIREMENTS

- A. Watertightness: Provide coated foamed roofing that is watertight and will not permit the passage of water.
- B. Material Compatibility: Provide polyurethane foam, elastomeric coatings, and miscellaneous roofing materials that are compatible with one another and able to bond to substrate under conditions of service and application required, as demonstrated by coated foamed roofing manufacturer based on testing and field experience.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written instructions for evaluating, preparing, and treating substrate; technical data; and tested physical and performance properties. Include the FM Approval Assembly Number for the assembly being submitted, including the Assembly Numbers for the field, perimeter and corners of the roof.
- B. Submittal of the above product, installation details and Assembly Numbers to the Owner's insuring agency for review and acceptance is required prior to purchasing any materials and any work being performed.
- C. Samples for Verification: For coated foamed roofing, prepared on Samples of size indicated below:
 - 1. Samples, 12 by 12 inches, on rigid backing, showing polyurethane foam of thickness required and stepped coatings in colors required to illustrate buildup of coated foamed roofing.
- D. Maintenance Data: For coated foamed roofing to include in maintenance manuals.
- E. Accreditation: Provide documentation that the SPFA and the Manufacturer's accreditation requirements have been met.

1. Provide list of personnel that will be working on the project and their accreditation.
- F. Fastening Pattern: For any substrate or insulation board that is mechanically fastened to the decking.
- G. Construction Details: All construction details as they apply to the coated foam roof shall be submitted for approval.
- H. Warranty: Sample of special warranty.

1.5 QUALITY ASSURANCE

- A. Inspection/Quality Assurance and Testing by WRECORP:
 1. Submittal review.
 2. Pre-construction meeting administration.
 3. Monitor roofing system application.
 4. Verification of foam compressive strength and in-place density.
 5. Final inspection
 6. Closeout inspection.
 7. Warranty and Work History Report.
- B. Installer Qualifications: A qualified installer who is approved, authorized by roof coating manufacturer for installation of manufacturer's product over polyurethane foam.
 1. Engage an installer who participates in and who has fulfilled requirements of the SPFA Accreditation Program for company accreditation and individual applicator accreditation for personnel assigned to work on Project.
 2. **All members** of the crew that work on the project must have completed the Spray Polyurethane Foam Accreditation Program or completed the Manufacturer's Accreditation Program for foam and coatings.
 3. **All members** of the crew shall have completed OSHA 10 hour fall protection.
- C. Manufacturer Qualifications: Manufacturer must provide a minimum 4-hour accreditation program that is based on the Spray Polyurethane Foam Accreditation Program. Manufacturer will provide certificates of completion along with photo ID cards with the name of the person passing the course along with the contractor's name, and date of completion.
- D. Source Limitations: Obtain polyurethane coated foam materials from the source or producer that will provide the warranty.
- E. Comply with recommendations in NRCA's "Quality Control Guidelines for the Application of Spray Polyurethane Foam Roofing."
- F. All construction details shall be in accordance with the NRCA, SPFA, and SMACNA construction details as they apply to coated foam roof systems, and be approved by the coated foam manufacturer prior to application.
- G. Comply with recommendations in SPFA AY 104, "Spray Polyurethane Foam Systems for New and Remedial Roofing."
- H. All insulation shall be covered with foam and all foam shall be covered with base coating by end of work day of application.

- I. Preinstallation Conference: Conduct conference at Project site.
 - 1. Mandatory Attendance: Roofing contractor's project manager, superintendent and foreman.
 - 2. Review methods and procedures related to coated foamed roofing including, but not limited to, the following:
 - a. Structural load limitations.
 - b. Construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - c. Certifying procedures.
 - d. Surface preparation specified in other Sections.
 - e. Substrate condition and pretreatment.
 - f. Minimum curing period.
 - g. Forecasted weather conditions.
 - h. Special details and sheet flashings.
 - i. Installation procedures.
 - j. Testing and inspection procedures.
 - k. Protection and repairs.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original containers with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, shelf life, and directions for storing and mixing with other components.
- B. Store materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by manufacturer. Protect stored materials from direct sunlight.
- C. Remove and replace material that cannot be applied within its stated shelf life.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install coated foamed roofing until roof openings, curbs, and parapets, if any, are complete and roof drains, vents, and other roof penetrations are in place.
- B. Weather Limitations: Proceed with installation only when existing and forecasted weather conditions permit roofing work to be performed according to coated foamed roofing manufacturer's written instructions and warranty requirements.
 - 1. Apply materials within the range of ambient and a substrate temperature recommended by roofing material manufacturers, and is 50 deg F and rising.
 - 2. Apply materials within range of relative humidity recommended by manufacturer of each component, but not when relative humidity exceeds 85 percent, nor when temperatures are less than 5 deg F above dew point.
 - 3. Do not apply materials to damp or wet surfaces.
 - 4. Do not apply primers, polyurethane foam, or coatings in snow, rain, fog, or mist, or when such weather conditions are imminent during the application and curing period.
 - 5. Do not apply polyurethane foam when wind conditions result in surface finish textures not complying with requirements.
 - 6. Do not apply coatings when wind conditions prevent uniform coating application.

1.8 WARRANTY

- A. System Warranty: Coated foamed roofing manufacturer agrees to repair or replace coatings and foam roofing system that does not comply with the following requirements.
 - 1. Perform as designed and installed.
 - 2. Remain watertight.
 - 3. Remain free of manufacturer or installation defects.
- B. Warranty Period: 20-years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 POLYURETHANE FOAM

- A. Polyurethane Foam: Rigid cellular polyurethane, spray applied, produced by the catalyzed chemical reaction of polyisocyanates with polyhydroxyls, with stabilizers, fire retardants, and blowing agents added; and complying with ASTM C 1029, Type III, as certified by a qualified independent testing agency.
 - 1. **Manufacturers: Subject to compliance with requirements, foam and coatings must be provided by the source of the warranty:**
 - a. BASF
 - b. Henrys
 - c. Or equal

Density: Minimum 3.0lb/cu. ft.; ASTM D 1622.
 - 2. Thickness: Minimum 2 inches.

2.2 AUXILIARY MATERIALS

- A. Mineral Aggregate: White aggregate cleaned and treated to minimize dusting.
 - 1. Approved Manufacturers
 - a. Lucas #10 Fire White
 - b. Or equal
- B. Insulation Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FMG 4470, and designed and sized for fastening thermal barrier to substrate, per FM Assembly details.
- C. Insulation Adhesive: Insulation and cover board adhesive shall be a two part component foam adhesive designed to adhere products using the manufacturers recommended application rates to achieve required wind uplift ratings.

PART 3 - EXECUTION

3.1 *TEAR OFF /EXAMINATION*

- A. *Tear off the existing roof system down to the substrate at locations indicated by consultant.* Examine substrates, areas, and conditions under which coated foamed roofing will be applied, with Installer present, for compliance with requirements. Begin installation only after unsatisfactory conditions have been corrected and substrates are dry.
 - 1. All roof decks must be properly sloped to provide for positive drainage to the drains or scuppers.

3.2 SURFACE PREPARATION

- A. Clean and prepare substrate according to coated foamed roofing manufacturers written instructions. Provide clean, dust-free, dew-free, and dry substrate for coated foamed roofing application.
- B. Remove grease, oil, form-release agents, curing compounds, and other contaminants from substrate.
- C. Cover and mask adjoining surfaces not receiving coated foamed roofing to prevent overspray or spillage affecting other construction. Close off roof drains, removing roof-drain plugs when no work is being done or when rain is forecast.
 - 1. Remove masking after polyurethane foam application and remask adjoining substrates before coating.
- D. Fill, cover, or tape joints and cracks in substrate that exceed a width of 1/4 inch. Remove dust and dirt from joints and cracks before applying polyurethane foam.

3.3 POLYURETHANE FOAM APPLICATION

- A. General: Mix and apply polyurethane foam according to ASTM D 5469 and coated foamed roofing manufacturer's written instructions.
 - 1. Fill irregularities and areas of ponding.
 - 2. Apply the required full thickness of polyurethane foam in any specific area on same day.
 - 3. **Apply only the area of polyurethane foam that can be covered on same day with required base coating. Base coatings shall be applied by the end of each work day.**
 - 4. Apply polyurethane foam to avoid overspray beyond immediate area of work.
- B. Apply polyurethane foam in lift thicknesses not less than 1/2 inch and not more than 1-1/2 inches.
- C. Uniformly apply total thickness of polyurethane foam indicated, but not less than 2 inches, to a surface tolerance of plus 1/4 inch and no minus.
- D. Apply polyurethane foam to roof penetrations, terminations, and vertical surfaces as indicated. Unless otherwise indicated, extend polyurethane foam at least 4 inches above elevation of adjacent roof field.
- E. Surface Finish: Provide finished surface of polyurethane foam within the following range of surface textures as defined by ASTM D 5469:
 - 1. Texture: Smooth, orange peel or coarse orange peel.
- F. Remove and replace polyurethane foam not complying with minimum surface-texture limitations. Remove defective thickness and prepare and reapply polyurethane foam with acceptable, uniform results.

3.4 COATING APPLICATION

- A. Allow polyurethane foam substrate to cure for a minimum of two hours and remove dust, dirt, water, and other contaminants before applying coating.
- B. Apply coating system to polyurethane foam, in accordance with the below listed application rates and thicknesses, by spray, roller, or other suitable application method.
- C. Apply mineral granules to the coating system by means of mechanical means; no hand broadcasting will be permitted.
- D. Single Granule Application With Top Lock Coat:
 - 1. Apply base coat on same day as polyurethane foam is applied at the rate to achieve a minimum 13 mils DFT and allow it to cure.
 - 2. After the base coat has cured, apply an intermediate coat of a contrasting color, at the rate to achieve a minimum 13 mils DFT and broadcast 35 pounds per 100 square feet of aggregate into the wet coating.
 - 3. After the coating has cured, remove all loose granules and apply white coatings at a rate to achieve a minimum 18 mils DFT.
 - 4. Apply coatings at the rate to achieve a minimum 13 mils DFT and broadcast granules at the rate of 45 lbs per 100 square feet.
 - 5. After the coating has cured, remove all loose granules and apply white coatings at a rate to achieve a minimum 18 mils DFT.
- E. Apply coating system at wall terminations and vertical surfaces to extend beyond polyurethane foam by 4 inches, minimum.
 - 1. Minimum thickness of 45 mils DFT.
- F. Ground or Repaired Foam: Apply two applications of the base coat at the rate of 1.5 gallons per 100 square feet per each coat and allow it to cure.

3.5 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.
 - 1. The owner reserves the right to take core and slit sample to determine if the polyurethane foam meets the minimum density as specified and is properly bonded to the substrate, with Contractor present.
 - 2. Locations of the core and slit samples shall be as directed by the owner or his representative.
 - 3. The contractor prior to application of first set of granules shall cut core and slit samples. Samples will be turned over to the testing agency.
 - 4. Testing agency will perform tests for any product characteristics specified or cited in coated foamed roofing manufacturer's product data.
 - a. 2 core samples will be required for roof areas up to 10,000 sq. ft., and 1 core sample will be required for each additional 10,000 sq. ft. or part thereof or per deck if smaller than 10,000 sq. ft.
 - b. Slit-test samples will be taken to determine number of coats applied and dry film thickness of coating. A minimum of 2 slit samples will be taken per deck.
 - c. Roofing contractor shall repair all areas where core and or slit sample are taken and bear the financial responsibility for the repairs.

- B. Correct deficiencies in, or remove, foam or coatings that do not comply with requirements; fill and repair substrates and reapply materials.
- C. Additional testing, at Contractor's expense, will be performed to determine compliance of corrected Work with requirements.

3.6 REPAIR AND RECOATING

- A. Repair and recoat coated foamed roofing according to ASTM D 6705 and coated foamed roofing manufacturer's written instructions.

3.7 CURING, PROTECTING, AND CLEANING

- A. Cure coatings according to coated foamed roofing manufacturer's written instructions, taking care to prevent contamination and damage during application stages and curing. Do not permit traffic on uncured coatings.
- B. Protect coated foamed roofing from damage and wear during remainder of construction period.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 075705