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FOAM ROOF GUIDE SPECIFICATION

Attachment SP

REPAIR & RECOAT

SPRAYED POLYURETHANE FOAM (SPF) ROOFING SYSTEM

ACRYLIC ELASTOMERIC ROOF COATING

Fifteen (15) YEAR CONTRACTOR RECOAT WARRANTY

1.0 GENERAL REQUIREMENTS

1.1 Terms and Conditions

1.1.1 The roofing contractor is the prime contractor. All subcontractors shall be identified and approved at the time the proposal is submitted. Manufacturers' installation procedures shall be the basis for accepting or rejecting actual workmanship.

1.1.2 Bidders shall be pre-qualified as follows:

a. All bidders shall be contractors who have specifically performed the application of sprayed-in-place polyurethane foam roofing systems. Such bidders shall have installed these systems for not less than ten years under the same contractor's name and license. Each bidder shall have performed at least fifteen applications of similar types and size. Bidders shall submit, with the bid, a list of projects including date of completion and contact information for verification.

b. The Contractor shall be a current member in good standing with the Spray Polyurethane Foam Alliance and Accreditation Program. A copy of the SPFA membership certification shall be submitted with the bid. Completion of the Roofing Master Installer and Fundamentals of Spray Polyurethane Foam and Coating Systems is the minimum acceptable status in the accreditation program by the supervisor(s) and spray mechanic(s) assigned to the project.

c. Each bidder shall submit a copy of the proposed Ten (10) Year Recoat Warranty along with the bid.

- d. The contractor shall carry a minimum of \$2,000,000 in general liability insurance on a continuing basis. Verification of insurance shall be submitted at the time of bid.
- e. The contractor shall submit, with the bid, a current license status printout from the Contractor's State License Board at <http://www.cslb.ca.gov> to demonstrate that the license is in good standing.
- f. Certification of the Manufacturer/Supplier: Submit, on corporate letterhead, a letter from the manufacturer supplier of the foam and from the supplier of the coating stating that the applicator of these products is qualified by the manufacturer supplier and meets sections 1.1.2 a and b.
- g. The contractor shall cooperate as required in performance of the specified inspecting and testing.
- h. Failure of the bidder to submit items A through F in its entirety with the bid will be deemed non-responsive.

1.1.3 Suppliers shall be pre-qualified as follows:

- a. The manufacturer of the foam and coating shall have been in business for a minimum of ten years and shall maintain a minimum of \$5,000,000 of product liability insurance on a continuing basis.
- b. The manufacturer of the foam and coating shall have a minimum of 3,000,000 square feet of roofing system installed.
- c. The foam and coating shall be listed as Class A over existing non-combustible roofing systems by Underwriters Laboratories per UL 790 at the thicknesses intended for use.
- d. The foam and coating shall be listed as Class B over existing combustible decks by Underwriters Laboratories per UL 790 at the thicknesses intended for use.
- e. Failure of the bidder to submit items A through D in their entirety will be deemed non-responsive.

1.2 Submittals

- 1.2.1 Manufacturer's Literature: Submit two copies of the manufacturer's data sheets regarding specifications, application information and safety information, and safety instructions on each product proposed for use.
- 1.2.2 Samples: Submit two samples of the proposed coating system applied on urethane foam. Samples shall be two inches by four inches in size.

- 1.2.3 UL follow up service: The foam and coating shall be registered under the UL follow up service and bear UL labels.
- 1.2.4 Contractors shall submit a computer-generated milestones schedule showing each specific phase of work along projected completion dates.

2.0 MATERIALS AND EQUIPMENT

2.2 Caulking or Sealants

Caulking materials shall be single-component polyurethane elastomer such as “Vulkem-921”, “Sikaflex-1a”, or approved equal. Roof field caulking shall be compatible with the respective elastomeric roof coating.

2.3 Polyurethane Foam: Polyurethane foam shall be a two-component polyurethane foam system formulated for use through airless equipment and manufactured by BASF.

Density (sprayed-in-place)	2.8-3.0 pcf min.
Compressive Strength	50-60 psi min.
Tensile Strength	70-75 psi min.
Shear Strength	50-60 psi min.
Closed Cell Content	95% min.
K Factor, Initial	0.11
Flame Spread (ASTM E84)	75 max.*
Roof Deck Classification:	ASTM E108 (UL 790)
Combustible Deck	Class B
Noncombustible Deck	Class A

*This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

2.4 Acrylic rubber roof coating: The elastomeric coating shall be an acrylic elastomer coating and shall be Energy Star rated with the U.S. Environmental Protection Agency and California Title-24 Cool Roof Compliant.

Solids by Volume	56%
Solids by Weight	70%
Flash Point	>212°F
Initial Elongation (%)	310
Initial Tensile Strength	350 psi
Dry Adhesion	8.0 pli
Wet Adhesion	3 pli
Tear Resistance	130 lbf/in

1000 hr Accelerated Weathering	No Cracking or Checking
Elongation after Accelerated Weathering (%)	220
Low Temperature Flexibility after Accelerated Weathering	Pass
Permeance	19 perms
Water Swelling	6%
Fungi Resistance (zero = No Growth)	Zero Rating
Impact Resistance	>160
Tension Set @ 100%	0%
Durometer Hardness: Shore A	72

The minimum dry film thickness of the coating shall be 24 dry mils. Plasticized acrylics, vinyls, EVA's, terpolymers and PVA coatings shall not be considered.

- 2.6 Equipment: Equipment for spraying foam shall be manufactured specifically for the application of polyurethane foam. The equipment shall be airless, capable of maintaining a 1:1 volume ratio and have primary and hose heaters. Coating equipment shall be an airless type as recommended by the coating manufacturer.

3.0 SURFACE PREPARATION

Surface Condition: Identify and repair all leaks. The following areas are the most critical:

- a. Internal roof drains, scuppers and downspouts
- b. Edge detail, parapet walls and corner flashings
- c. Expansion joints, skylights, ductwork and air handling units
- d. Other roof penetrations such as soil pipes, ventilators and curbs

3.1 Surface Condition

Owner shall ensure that roof top equipment does not discharge liquids onto roof. All blowers shall exhaust into a container or the atmosphere and not onto the roof. The surface shall be free from solvent, grease, dust, sediment, dirt and sticky mastic.

- 3.2 All prepared surfaces to receive SPF roofing materials are to be primed with 1/3-1/2 gallon per 100 square feet using the appropriate primer as necessary.

- 3.3 All surfaces not to receive SPF roofing materials such as walls, shrubbery, pipe/conduit runs, windows, air conditioners and other roof mounted equipment shall be carefully masked with tape and paper to avoid overspray. Overspray shall be immediately

removed at the contractor's expense. **All coating shall be terminated in clean straight lines.**

- 3.4 Inspect the roof surface and establish the presence of any blisters or cracks in the existing insulation, or saturated or delaminated foam or coating areas. Remove the materials from all areas where temporary repairs have been made. Prime all areas to receive insulation. Flash all new penetrations with insulation. Spot repairs must be ground to match surrounding grade and sealed with acrylic elastomer.
- 3.5 If any of the existing SPF roofing system is to be scarified, remove the existing coating and approximately ¼ -inch of existing polyurethane foam by scarifying. Insure that the remaining foam is clean, sound and dry. All scarified foam must be re-foamed at a minimum ½ -inch thickness and base coated the same day per manufacturer's recommendation. **There will be no exceptions.**
- 3.6 Remove all blisters to the deck and re-spray. Cracked, delaminated and saturated insulation shall be removed and the area re-sprayed. Grind all repairs to match the surrounding grade.
- 3.7 Repair all bird pecks and other mechanical damage by cutting away the damaged material or temporary repair materials and filling the void with a single component urethane caulking material per paragraph 2.2 above. Smooth the repaired area to conform to the surrounding roof grade.

Where the roofing system has failed or is damaged at existing perimeter edge metal, the edges may be repaired by trimming the damaged foam to sound foam and caulking and coating the repaired area.

Smooth the repaired area to conform to the surrounding roof grade.

4.0 APPLICATION OF POLYURETHANE INSULATION

- 4.1 Environmental Conditions
 - 4.1.1 Wind velocity shall not exceed 12 miles per hour.
 - 4.1.2 Application of spray insulation shall not proceed if ambient temperature is less than 50 degrees Fahrenheit or if the substrate temperature is less than 60 degrees Fahrenheit.
 - 4.1.3 Spray insulation shall not be applied over moist substrates or where rain or inclement weather is imminent.
- 4.2 Spray Application
 - 4.2.1 The polyurethane insulation shall be applied in minimum ½ inch lifts to a minimum thickness of one (1) inch over the existing scarified foam. **Additional foam thickness shall be applied to provide positive slope-to-drain as necessary.**
 - 4.2.2 The insulation surface shall be free from bumps, pinholes and ridges. The surface shall exhibit a smooth or "orange peel" surface texture. Surfaces resembling "popcorn" or "tree bark" shall be deemed unacceptable.

5.0 APPLICATION OF FLUID APPLIED PROTECTIVE COATING

5.1 General

Sprayed polyurethane insulation must be protected from ultraviolet light in order to avoid degradation of the polymer. Coating also protects the insulation from water and adverse weather conditions. Coatings must be specifically formulated for use over sprayed polyurethane insulation.

Elastomeric Coating

The roof perimeter shall be coated in a picture frame fashion and backrolled. The coating is then to be applied to the properly prepared surface of the roof in two (2) uniform passes. The **base coat** shall be **off-white** in color and shall be applied at the rate of **2 gallon** per 100 square feet, backrolled, and allowed to cure. The **topcoat** shall be **white** in color and shall be applied at the rate of **2 gallons** per 100 square feet.

Broadcast 3M C-93 ceramic roofing granules into the wet topcoat at the rate of 40 lbs. per 100 square feet, or to the point of refusal. Remove all loose granules after coating has cured.

6.0 WARRANTY AND CERTIFICATION

The contractor shall issue a Fifteen (15) year non-depreciating full system recoat warranty.

7.0 INSPECTION

A representative from the materials manufacturer and contractor shall inspect the roof after completion to ensure that the work has been completed in conformance with the specification and accepted industry practice. All material thickness shall be verified.

8.0 CLEAN UP

Upon completion of all work covered in this specification, the contractor shall remove all equipment, material and debris, leaving the area undamaged and in acceptable condition.