

**SECTION 09 67 00
FLUID-APPLIED FLOORING**

PART 1 - GENERAL

1.1 SUMMARY (Specification writer shall add, delete or amend, as deemed necessary)

- A. Provide all labor, materials, equipment and supervision as necessary to install a multi-component, waterproof flooring system consisting of primer, elastomeric waterproofing membrane layer, fabric reinforcement, cementitious wearing course, and finished color topcoat on **(new or existing)** mechanical equipment room concrete floor slabs over occupied space, as shown on the project drawings and as outlined in this specification.
- B. Following all applicable manufacturer's guidelines and application instructions shall be considered a requirement of this specification.
- C. Related Sections: **(Specification writer shall add, delete or amend, as deemed necessary)**
 - 1. Section 03 30 00 – Cast-in-Place Concrete
 - 2. Section 03 35 00 – Concrete Finishing
 - 3. Section 03 39 00 – Concrete Curing
 - 5. Section 07 92 00 – Joint Sealants
 - 6. Section 22 13 00 – Facility Sanitary Sewerage (Sanitary Drains)

1.2 REFERENCES (Specification writer shall add, delete or amend, as deemed necessary)

- A. ASTM C109: Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.
- B. ASTM C190: Method of Test for Tensile Strength of Hydraulic Cement Mortars.
- C. ASTM C580: Standard Test Method for Flexural and Modulus of Elasticity of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes.
- D. ASTM F1869-04: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub-floor Using Anhydrous Calcium Chloride.
- E. ASTM F2170-11: Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in Situ Probes.
- F. ICRI Technical Guideline No.03732: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.

1.3 SUBMITTALS (Specification writer shall add, delete or amend, as deemed necessary)

- A. General: Submit () number of copies each of the following items in accordance with the requirements of the Conditions of Contract and in Division 1 Specification Sections.
- B. Product Data: Submit manufacturer's technical data sheets, available shop drawings, applicable installation guidelines or recommendations, and material safety data sheets for each product and/or composite system included in this specification.
- C. Material and Mock-up Samples: For **initial selection**, submit manufacturer's standard color charts or cured material samples for review by the specification authority and owner's representative. For **final selection**, submit sample boards or perform mock-ups (**specification writer shall specify sample size**) to exhibit pattern, texture, color and finish of the mechanical equipment room flooring system.

- D. Material certificates signed by the manufacturer certifying that the fluid-applied, mechanical equipment room flooring and all components of the system comply with all requirements specified herein.
- E. Warranties: Submit a sample of the manufacturer's standard material warranty and the contractor's labor warranty.
- F. Project Reference List: Contractor shall submit a minimum of 5 recently completed projects of a similar nature and include total contract value.

1.4 QUALITY ASSURANCE

- A. **Manufacturer Qualifications:** The manufacturer of the products specified in this section shall have a minimum of 5 years experience in the production of these types of products.
- B. **Contractor Qualifications:** The contractor installing the products specified in this section shall have a minimum of 3 years experience and have successfully completed no less than 5 projects similar in scope and complexity, and is acceptable to and has been trained by the manufacturer.
- C. **Substitutions:** Requests for the approval of any product other than those specified in this section must be submitted to the specifying authority two weeks prior to the bid, and shall include complete application specifications and physical characteristics. Any request after this date will not be accepted. Failure of performance requires immediate removal and replacement of unapproved substituted material with those originally specified at no cost to the owner, Architect, construction manager, or general contractor.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name, batch or lot numbers, and directions for storage and mixing with other components.
- B. Store materials to comply with manufacturer's directions to prevent from damage and/or deterioration from moisture, heat, cold, direct sunlight, or other detrimental effects.

1.6 PROJECT CONDITIONS

- A. **Environmental Conditions:** Comply with all the manufacturer's directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation, and other conditions required to execute and protect completed work. In hot and cold weather conditions or when high evaporation rates or adverse conditions may be expected, the contractor will be responsible for the quality of the completed installation. Follow all recommendations and guidelines of the American Concrete Institute, as published in ACI Committee 305 for Hot-Weather Concreting and ACI Committee 306 for Cold-Weather Concreting.
- B. **Lighting:** Permanent lighting will be in place and working before installing the proposed pedestrian walking deck and/or roof covering system.
- C. **Protection:** Protect newly installed mechanical equipment flooring system from rain or other potentially harmful climatic conditions for a minimum of 24 hours, from potential damage due foot or vehicular traffic and/or from the work of other trades.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. **Approved Manufacturer:** Miracote Division of Crossfield Products Corp., 3000 E. Harcourt Street, Rancho Dominguez, CA 90221, (310) 886-9100; also 140 Valley Road, Roselle Park, NJ 07204, (908) 245-2800, www.miracote.com.

2.2 MATERIALS

- A. Miraflex BRF (mechanical equipment room flooring) is a multi-layered, elastomeric, fracture-resistant, waterproofing membrane system consisting of a primary elastomeric, fabric-reinforced waterproofing layer, a cementitious protective wear course, and colored acrylic top coat.
- B. System Components:
 1. MiraFlex Membrane A - Single-component SBR, fluid-applied primary waterproofing layer.
 2. Miracote Poly Fabric – Polypropylene, alkaline-resistant, woven mesh reinforcement fabric.
 3. MiraPatch RM 3 – Two-component, polymer-modified, cementitious, protective wear course.
 4. MiraGard Colorbond XL – Single component, self-crosslinking, pigmented acrylic top coat

2.3 PROPERTIES

- A. MiraFlex Membrane “A” Physical Properties:
Provide a single-component SBR, flexible, fluid-applied waterproofing material that meets or exceeds the listed minimum physical property requirements when tested in accordance with the referenced standard test method.

Waterproofness:	No passage of water
Elongation (ASTM D 638):	580%
Tensile Strength (ASTM D 638): 7 days dry / 21 days wet	345 psi
Bacteria & Fungus Resistance (ASTM G 22):	Passage Rating 2
Adhesion in Peel to Concrete:	8.3 lbs/in width
Moisture Vapor Transmission (ASTM E 96): 9 Grams/sq. meter/24 hrs	2.04 grams
Permeability (ASTM E 96):	0.013 perms/inch
Crack Bridging (ASTM E 836): 1/8” opening @ 77 F	Pass (no rupture)
Hydrostatic Resistance (ASTM D 751): Procedure B	Passes

- B. Miracote Poly Fabric Physical Properties:

Type:	Polypropylene
Compatibility:	Alkaline Resistant
Weave:	Open woven mesh

- C. MiraPatch RM 3 Physical Properties:
Provide a two-component only, liquid polymer-modified, flexible, cementitious protective troweled protective wearing course that meets or exceeds the listed minimum physical property requirements when tested in accordance with the referenced standard test method.

Two Component System	Liquid Polymer and Bagged Powder
Compressive Strength (ASTM C 109):	2,115 psi
Tensile Strength (ASTM C 190):	925 psi
Flexural Strength (ASTM C 580)	2,415 psi

Adhesion @ up to 1/8" thick:	192 psi (shear from steel plate)
Adhesion @ up to 1/4" thick:	122 psi (shear from steel plate)
Compressive Strength Loss (ASTM E 96): (3 days water immersion in 140°F (60°C))	4% max
Impact Resistance: (MIL-3134) Para. 4.7.3 (2# steel ball dropped from 8' height onto coated steel plate)	No cracking or detachment
Corrosive Effect (on aluminum or steel):	None
D. MiraGard Colorbond XL:	
Vehicle Type:	Acrylate co-polymer
Gloss Meter 60°:	>75+
Accelerated UV Exposure: (Desert Sunshine Exposure Test – EMMA Procedure)	No fading or deleterious effect

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all construction substrates and conditions where the mechanical equipment room flooring system is to be installed. Notify the Specifying Authority of any unsatisfactory conditions that may be detrimental to the proper and timely completion of the work.
- B. Do not proceed with the work until all such deficiencies have been corrected by the Contractor in an acceptable manner, and as approved by the Specifying Authority.

3.2 PREPARATION

- A. Protect all surrounding areas, walls, window glass, landscaping and other adjacent surfaces from the execution of each item of work including, but not limited to, surface preparation and all application steps involved in the installation of the mechanical equipment room flooring system.
- B. Perform surface and crack repairs as necessary to re-profile, re-level or to restore the integrity of the concrete substrate or other surfaces in general, as directed by the specifying authority. Concrete surface repair products shall be from the same manufacturer, or as approved by the manufacturer of the mechanical equipment room flooring system specified herein. Provide letter from the manufacturer of the surface repair materials verifying compatibility with the specified mechanical equipment room flooring system.
- C. Mechanical equipment room flooring system must be applied to a clean, sound and mechanically prepared concrete substrate to a minimum (**Specification writer shall choose between CSP-3 to CSP-6**) surface profile, in accordance with the International Concrete Repair Institutes (ICRI) Technical Guideline No. 310.2-1997, **Selecting and Specifying Concrete surface Preparation for Sealers, Coatings and Polymer Overlays.**
- D. (**As an optional requirement for this project document the specification writer can include the following when deemed necessary**) Contractor shall perform tensile bond tests, as directed by the Specification Authority, in accordance with International Concrete Repair Institutes (ICRI) Technical Guideline 03739, **Guide to Using In-Situ Tensile Pull-Off Tests to Evaluate Bond of Concrete Surface Materials.**

3.3 APPLICATION

- A. General: Follow all manufacturers' directions, as published in their product technical data sheets and/or available installation guidelines regarding the application of the mechanical equipment room flooring system, as specified herein.
- B. Joint Sealants: At the direction of the specifying authority, install backer rod and polyurethane sealant at joints, transitions, and penetrations.
- C. Detailing: Apply a coat of MiraFlex Membrane A and embed 10" wide Miracote Poly Fabric at all vertical and horizontal transitions, cracks, construction joints, pipe and drain penetrations, changes of plane and any other types of existing discontinuities that could undermine waterproofing integrity. Apply an additional coat of MiraFlex Membrane A over the embedded poly fabric to lock it in, and smooth out any wrinkles and voids.
- D. Priming Coat: Prime mechanically prepared concrete substrate with MiraFlex Membrane A diluted 50/50 with potable water and thoroughly mix with a drill and "Jiffy-type" paddle. Apply primer to a dry concrete substrate by roller at a rate of 400 SF per gallon.
- E. Primary Membrane Coat: Apply neat MiraFlex Membrane A over the entire floor and previously detailed areas at a rate of 64 SF per gallon by roller, and turn up at all vertical transitions. While membrane coat is still wet, immediately firmly embed 40" wide poly reinforcement fabric into the membrane. Apply an additional coat of MiraFlex Membrane A at a rate of 50 SF per gallon over the embedded poly fabric to lock it in, and smooth out any wrinkles and voids.
- F. Protective Wear Course: Within 12 to 24 hours after application of the second coat of primary membrane, trowel apply MiraPatch RM 3 at a minimum thickness of 1/16" (approximately 62.5 mils) in strict conformance to the most current version of the manufacturer's published installation guidelines and technical instructions.
- G. Acrylic Topcoat: When protective wear course is thoroughly dry (between 12 to 24 hours), apply two coats of MiraGard Colorbond XL by roller, brush or spray at a rate of 250-300 SF per gallon per coat.
- H. Allow completed mechanical equipment room flooring system to cure for 24 hours before subjecting to foot traffic.

3.4 CLEANING

- A. Clean work area and remove/discard all debris resulting from the application of the mechanical equipment room flooring system to the acceptance of the specifying authority or the owner.

3.5 PROTECTION

- A. Protect all completed work of the application during the specified cure time of the material from vehicular or pedestrian traffic, or any exposure to solid or liquid spillage or any other form of contamination.

END OF SECTION

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