

(Specification writer shall choose the most appropriate section that applies to a given scope of work, including but not limited to, the following listed sections)

**SECTION 07 18 16
VEHICULAR TRAFFIC COATINGS**

PART 1 – GENERAL

1.1 SUMMARY

- A. Provide all labor, materials, equipment and supervision as necessary to install a fluid-applied, multi-component, elastomeric hybrid, polymer-modified cementitious vehicular traffic coating system over **(new and/or existing)** horizontal concrete surfaces, as shown on the project drawings and as outlined in this specification.
- B. Following all the applicable manufacturers' guidelines and application instructions for each product used in the system 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
 - 4. Section 07 92 00 – Joint Sealants

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's, and Polymer Concretes.
- D. ASTM D4263: Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Test Method.
- E. ASTM F1869-04: Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subflooring Using Anhydrous Calcium Chloride.
- F. ICRI Technical Guideline No. 310.2R-2013: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays.
- G. ICRI Technical Guideline No. 710.2-2014: Guide for Horizontal Waterproofing of Traffic Surfaces.

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, any applicable installation guidelines or recommendations, and material safety data sheets for each product included in this specification.
- C. Samples: For **initial selection**, submit manufacturer's standard color charts for review by the specification authority and owner's representative. For **final selection**, submit sample boards (**specification writer shall specify sample size as deemed necessary**) to exhibit color and texture of the finished vehicular deck coating system. If a clear (**specification writer shall specify either penetrating sealer or film forming sealer**) sealer finish is desired, submitted sample boards shall also include same.
- D. Material certificates signed by the manufacturer certifying that the two-component, polymer-modified, cementitious vehicular traffic coating system comply with all requirements of the material specified herein.

- E. Warranty: Submit a sample of the manufacturer's standard material warranty.
- F. Contractor Project Reference List: Contractor shall submit a minimum of 5 recently completed projects of a similar nature and include total contract value of completed work.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: The manufacturer of the products specified in this section shall have a minimum of 5 years of 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 of experience and have successfully completed no less than 5 projects similar in scope and complexity and is acceptable to and has received formal training 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 unbroken seals 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 manufacturers' directions to prevent 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 complete 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 two-component, polymer-modified cementitious vehicular traffic coating system.
- C. Protection: Protect the newly installed cementitious traffic coating system from rain or other potentially harmful climatic conditions for a minimum of 24 hours, from any potential damages due foot or vehicular traffic, and/or from the work of other trades.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- 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

Miracote **MPC Hybrid Park Deck System** is a multi-layered, fracture-resistant, waterproofing membrane and vehicular traffic coating system consisting of a concrete substrate integral primer, an elastomeric copolymer emulsion waterproofing base layer, followed by a cementitious highly abrasion resistant traffic coating and other optional accessory materials.

- A. System Components Required:
 - 1. MiraFlex Liquid Membrane – Single-component, elastomeric polymer emulsion waterproofing membrane.
 - 2. Miracote MPC Regular – Dual-component, polymer-modified, flexible cementitious park deck base coat.
 - 3. Miracote MPC Hard – Dual-component, polymer-modified, flexible, high abrasion resistant park deck topcoat.
- B. Accessory Components Optional:
 - 1. MiraPrime Aqua-Blok XL - Single-component, water-based potassium lithium colloidal silicate primer.
 - 2. Miracote Poly Fabric Ultra – Non-woven, thermally-set, spun-bonded, polyester fabric reinforcement mesh.

3. MiraPatch RM 3000 – Single-component, polymer-modified, cementitious concrete trowel-grade repair mortar.
4. MiraPatch RM 2 – Two-component, polymer-modified, cementitious, squeegee-grade concrete repair mortar.
5. MiraFlex Hybrid Sealant – Single component hybrid STPE polymer construction sealant.
6. Miraflex Hybrid Sealant SL – Single component, low viscosity, self-leveling hybrid STPE polymer sealant and adhesive
7. MiraGard HDWB – Single component, water-based, self-crosslinking acrylic clear sealer.
8. MiraThane CRU – Two-component, water-based, clear aliphatic polyurethane coating in gloss/matte finishes.

2.3 PROPERTIES

A. Physical Properties: MiraPrime Aqua-Blok XL

Provide a single component, reactive penetrating colloidal silicate integral waterproofing primer that meets the following listed minimum physical property or characteristics.

Vehicle Type:	Water-based solution
Reactive Agent:	Potassium Lithium Silicate
Color:	Clear
Flash Point:	None
Flammability:	None
Specific Gravity:	1.10
Odor:	None
pH:	11 – 12
Weight/Gal:	10.5 lbs./4.76kg
VOC (grams/liter):	0.0

B. MiraFlex Liquid Membrane 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.

Solids Content	50%
Elongation (ASTM D638):	580%
Tensile Strength (ASTM D638): (7 days dry / 21 days wet)	345 psi
Bacteria & Fungus Resistance (ASTM G21)	No Growth
Adhesion in Peel to Concrete	8.3 lbs./in width
Moisture Vapor Transmission (ASTM E96) (9 Grams/sq. meter/24 hrs.)	2.04 grams
Permeability (ASTM 96)	0.013 perms/inch
Crack Bridging (ASTM E836) (1/8" opening @ 77 F)	Pass (no rupture)

C. MiraFlex Hybrid Sealant Physical Properties: (As required)

Provide single component hybrid STPE polymer construction sealant.

Uncured Viscosity:	>1,000,000 cps
Tack-free Time:	40 – 50 minutes
Odor	Mild ester smell
Color:	Limestone Gray
Elongation:	300 – 400%

Modulus:	130 psi
Shrinkage:	Nil
Durometer Shore A:	30 +/- 3
C. Miraflex Hybrid Sealant SL Physical Properties: (As required) Provide single component, self-leveling, hybrid STPE polymer sealant.	
Uncured Viscosity:	30,000 cps +/- 15,000 cps
Tack-free Time:	60 minutes
Odor:	Mild ester smell
Color:	Limestone Gray
Elongation:	>300%
Shrinkage:	Nil
Durometer Shore A:	31
D. Miracote Poly Fabric Ultra Physical Properties: (As required) Provide polyester, open weave reinforcing fabric for crack and transition zones.	
Type:	Polyester
Compatibility:	Alkaline Resistant
Weave:	Non-woven mesh, thermally-set, spun-bonded
E. Physical Properties: Miracote MPC Parking Deck Coating Provide a two-component only, polymer-modified, cementitious resurfacing system 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 C109):	2,440 psi
Tensile Strength (ASTM C190):	450 psi
Flexural Strength (ASTM C580)	2,415 psi
Adhesion (MIL-D-3134, Para.4.7.14):	515 psi
Water Absorption (ASTM C642)	1.61%
Water Vapor Permeability (ASTM E96)	1.96 perms/inch
Water Vapor Permeance (ASTM E96)	>14.6 perms
Impact Resistance: (MIL-3134) Para. 4.7.3 (2# steel ball dropped from 8' height onto coated steel plate)	No cracking or detachment
Freeze-Thaw Resistance (ASTM C672)	Thirty-two cycles, "O" Scaling
F. Physical Properties: MiraGard HDWB Sealer	
Vehicle Type:	Self-crosslinking acrylic copolymer
Cleaning Solvent:	Water
Curing Time (77 F):	
Dry to Touch:	30 minutes
Recoat	1 hour
Traffic Exposure	24 hours

Hot Tire Resistance	7 days
G. Physical Properties: MiraThane CRU	
Vehicle Type:	Aliphatic polyurethane coating
Cleaning Solvent:	Water
Curing Time (77 F):	
Dry to Touch:	4 hours
Recoat	4 hours min. - 24 hours max.
Traffic Exposure	24 hours
Hot Tire Resistance	3 days

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all concrete or other substrates and conditions where the architectural cementitious resurfacing 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, landscape and other adjacent surfaces from the execution of each item of work including, but not limited to, surface preparation and all application steps of the cementitious resurfacing installation.
- B. Perform surface and crack repairs as necessary to re-profile, re-level or to restore the integrity of the concrete substrate 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 vehicular traffic coating system specified herein. Provide letter from the manufacturer of the surface repair materials verifying compatibility with all specified components of the system.
- C. Crack Treatment: Rout all cracks >1/16" and seal with MiraFlex Hybrid Sealant, tooled flush, as per manufacturer's recommendations and details. Broadcast fine grade oven-dried sand into wet sealant to promote adhesion of subsequent waterproofing membrane layer over sealed crack interface. Detail all cracks <1/16" with waterproofing membrane layer, as per manufacturer's recommendations and details.
- D. The fluid-applied, hybrid vehicular traffic coating 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-5**) surface profile, in accordance with the International Concrete Repair Institutes (ICRI) Technical Guideline No. 310.2R-2013, **Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays.**
- E. **(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, available installation guidelines and detail drawings regarding the application of the MPC Parking Deck Coating System, as specified herein.
- B. Corrosion Mitigation: **(If applicable)** Apply MiraPrime Aqua-Blok XL in accordance with manufacturers product technical data sheet to mitigate existing corrosion at a 95% Confidence Limit as per U.S. Bureau of Reclamation independent M-82 Corrosion Mitigation Protocol Testing.
- C. Waterproofing Layer: Prior to use, MiraFlex Liquid Membrane must be mixed briefly with a low-speed

drill to re-disperse any polymer solids that may have settled at the bottom of the pail. Apply the waterproofing base coat of MiraFlex Liquid Membrane over properly prepared concrete substrate with notched squeegees at a rate of 64 SF per gallon followed by a back. During the application of MiraFlex Liquid Membrane a mil gauge is required to verify the correct wet film thickness is being achieved. When dry to the touch and within a 24-hour window, apply the first coat of Miracote MPC Hybrid Park using the MPC Regular Powder component.

- D. Traffic Base Coat: Apply the first coat of the Miracote MPC over the waterproofing layer when completely dry and can be walked on without damage. MPC traffic base coat shall have a mix ratio of 2 bags of regular powder to 5 gallons of liquid catalyst. Apply at a rate of 500 SF per unit of mixed material. Use of Miracote Set Retarder is mandatory during application of the MPC when “Hot Weather Conditions” are present.
- E. Traffic Topcoat: When dry to the touch and can be walked on without damage, apply one coat MPC Hard over the previous MPC coat. MPC traffic topcoat shall have a mixed ratio of 2 bags of hard powder to 5 gallons of liquid catalyst. Apply at a rate of 500 SF per unit of mixed material. Use of Miracote MPC Retarder is mandatory during application of the MPC when “Hot Weather Conditions” are present.
- F. Sealer: **(Specification writer should consult with Miracote representative or technical service for appropriate recommendation regarding product selection and application requirements).**

3.4 CLEANING

- A. Clean work area and remove/discard all debris resulting from the application of the cementitious vehicular traffic coating system to the acceptance of the specifying authority or the owner.

3.5 PROTECTION

- A. Protect all complete 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