



FIVE STAR PRODUCTS, INC.

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DESIGN-A-SPEC™ GUIDELINES FIVE STAR WATERPROOFING

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PART A - GENERAL CONDITIONS - COATINGS AND WATERPROOFING

1.01 SCOPE

The work covered by this document consists of furnishing all equipment, materials, labor and performing all operations required for the application of cementitious coatings as directed by the engineer or owner.

1.02 QUALITY ASSURANCE

- A. The manufacturer shall have been in the business of manufacturing similar products for over ten years, maintain a strict quality assurance program, offer technical services and provide a representative at the jobsite for product training, prior to product installation, upon written request.
- B. The contractor shall submit to the engineer or owner, at least three job references where the contractor has successfully completed similar applications.

1.03 DELIVERY, STORAGE AND HANDLING

- A. All materials shall be delivered to the jobsite in their original, unopened packages, clearly labeled with the manufacturer's identification, printed instructions and batch code.
- B. Store and condition the specified product in accordance with the appropriate product data sheet.
- C. For handling instructions, refer to the Material Safety Data Sheet.

1.04 PROJECT/SITE CONDITIONS

Refer to PART C - PREPARATION, ENVIRONMENTAL CONDITIONS, or contact the manufacturer directly for any physical or environmental limitations required by the product.

1.05 MEASUREMENT AND PAYMENT

- A. Measurement of the coating application shall be on a square foot (square meter) basis of material applied.
- B. Payment for the coating application shall be at the unit price bid on a square foot (square meter) basis. This payment shall constitute full compensation for all labor, materials, tools, equipment and other items as necessary to complete the work as described in the contract documents. Progress payments will be made on the percentage of the work satisfactorily completed during each payment period in accordance with the provisions of the contract documents.

PART B - MATERIAL SPECIFICATION – COATINGS AND WATERPROOFING

2.01 MATERIALS

- A. The concrete waterproofing material shall be a blended, packaged, polymer modified cement-based mortar requiring only the addition of potable water. The material shall not contain any chlorides or lime other than amounts contained within the hydraulic cement composition. The manufacturer shall be ISO 9001 certified and have at least ten years experience in the manufacture of cement based coatings. The manufacturer shall offer technical services and provide a representative at the jobsite for product training prior to product installation upon five days advance notice.
- B. The concrete waterproofing material shall meet all the following typical performance criteria when cured at 73°F (23°C):
- | | | |
|----|--|----------------------|
| 1. | Compressive Strength, ASTM C 109 | |
| | 4 Hours | 3,000 psi (20.7 MPa) |
| 2. | Bond Strength, ASTM C 882 | |
| | 7 Days | 2,400 psi (16.5 MPa) |
| 3. | Chloride Ion Permeability, ASTM C 1202 | |
| | 1/8" (3 mm) minimum thickness | Very Low |

The data shown above reflect typical results based on laboratory testing under controlled conditions. Reasonable variations from the data shown above may result in the field. Test methods are modified where applicable.

- C. An acceptable product which meets these criteria is:

Five Star® Waterproofing

As manufactured by Five Star Products, Inc., Fairfield, CT 06824 (203) 336-7900.

- D. Subject to meeting the performance criteria stated above, other products may be formally submitted to the engineer for approval up to three days prior to the bid date. All requests for approval shall contain certified test data verifying conformance with this specification. Three references of successfully completed projects of similar nature and scope of the work detailed in this specification shall be provided, as well as a minimum ten year history of use in the industry. The testing laboratory shall certify to any modifications made to the tests performed and provide details of modifications.

PART C – PREPARATION - COATINGS AND WATERPROOFING

3.01 CONCRETE SURFACES

- A. Completely remove all loose, delaminated and weak concrete, oil, grease, laitance and other contaminants. Prepare concrete using acceptable mechanical means and concrete cleaners and degreasers as necessary to obtain clean, sound and rough surfaces. Fine aggregate shall be exposed creating a medium grade sandpaper profile or rougher.
- B. Stop all leakage through concrete, cracks or joints before installation.
- C. All cracks and joints not subject to movement shall be chipped open and prepared as necessary; then filled with a compatible repair material. Leave the surface rough to ensure bond of the coating.
- D. All cracks and joints subject to movement shall be treated as directed by the engineer.
- E. Patch all honeycombed or spalled concrete, and holes with a compatible repair material. Leave the surface of the repair rough to ensure bond with the coating.
- F. Soak concrete thoroughly with potable water. Concrete shall be saturated surface dry (SSD) at time of placement.

3.02 ENVIRONMENTAL CONDITIONS

- A. Condition and maintain all materials to between 45°F and 80°F (7°C and 27°C). Condition all surfaces that contact coatings to between 45°F and 90°F (7°C and 32°C) at time of application. Shade from direct sunlight as necessary.

3.03 EQUIPMENT AND MATERIALS

- A. All necessary tools, equipment and materials shall be in good condition and as close as possible to area being coated.
- B. Appropriate clothing and safety equipment shall be worn to avoid breathing dust and prevent eye and skin contact with both dry and mixed repair materials.
- C. An ample source of potable water shall be available for preconditioning, mixing and cleaning.

3.04 MIXING

[Select one of the following types of mixers, as appropriate for the specified product.

Mortar Mixer

- A. Provide an adequate number of mortar mixers in good operating condition for uninterrupted placement. Do not exceed one-half the maximum capacity of the mortar mixer.
- B. Pre-wet mortar mixer, empty excess water.
- C. Add approximately 80% of premeasured potable water and/or polymer to mixer. While mixing, slowly add material and mix to a uniform consistency. Add remaining water to achieve desired consistency. Do not exceed maximum water content as stated on product packaging or an amount that will cause segregation.
- D. Continue to mix thoroughly for approximately five minutes.
- E. Do not mix more material than can be placed within the working time of the material. Do not retemper the mix by adding additional water.

Drill and Paddle Mixer

- A. Place approximately 80% of premeasured potable water and/or polymer into pail. While mixing at a slow speed, slowly add material and mix to a uniform consistency. Add remaining water to achieve desired consistency. Do not exceed maximum water content as stated on product packaging or an amount that will cause segregation.
- B. Continue to mix thoroughly for approximately five minutes.
- C. Do not mix more material than can be placed within the working time of the material. Do not retemper the mix by adding additional water.

PART D – APPLICATION - COATINGS AND WATERPROOFING

4.01 PLACEMENT PROCEDURES

[Select one of the application methods below as appropriate.]

BRUSH

[For normal waterproof protection.]

- A. Apply two to three coats to obtain a minimum total applied thickness of 1/16 inch (1.6 mm) leaving no pinholes or voids.
- B. Allow a minimum of four to eight hours between coats, depending on temperature.
- C. Always coat entire surface continuously, keeping a wet leading edge whenever possible. When impossible, only stop at corners or edges.

TROWEL

[For maximum waterproof protection.]

- A. Apply in one coat by trowel to a minimum 1/8 inch (3 mm) thickness, completely filling all holes and voids; leaving no pinholes.

PART E – FINISHING AND CURING - COATINGS AND WATERPROOFING

5.01 FINISHING

[Roller and brush applications do not need to be finished.]

- A. Finish trowel coat when it offers stiff resistance using a sponge float or steel trowel.

5.02 CURING

- A. Protect coating from rain, moisture, hydrostatic pressure and temperatures below 45°F (7°C) for a minimum of 24 hours.
- B. Moist curing and curing compounds shall not be used.

PART F – EXTREME WEATHER CONDITIONS - COATINGS AND WATERPROOFING

6.01 COLD WEATHER COATING

[Low temperatures delay the set, increase working time and delay the strength development of cement-based products. The procedures below will compensate for these conditions.]

- A. Materials shall be conditioned as necessary so that the mixed material is between 45°F and 80°F (7°C and 27°C). Up to 72 hours of conditioning may be necessary, depending upon quantity of material.
- B. All surfaces in contact with coating must be preconditioned and maintained at a temperature between 45°F and 90°F (7°C and 32°C) for a minimum of 24 hours.
- C. Heating shall be accomplished by indirect exposure. Heated enclosures must be windproof and weatherproof. Combustion heaters must be vented and shall not be permitted to heat and dry the concrete locally. *Caution: Exhaust gases may contaminate or cause carbonation within the enclosed environment.*
- D. Protect from freezing, rain, hydrostatic pressure and traffic for 24 hours.

REFERENCE

ACI 306R-88
"Cold Weather Concreting"

PART F – EXTREME WEATHER CONDITIONS - COATINGS AND WATERPROOFING

6.01 HOT WEATHER COATING

[High temperatures accelerate the set, decrease working time, and accelerate the strength gain of cement-based products. The procedures below will compensate for these conditions.]

- A. Materials shall be conditioned as necessary so that the mixed material is between 60°F and 90°F (16°C and 32°C). Up to 72 hours of conditioning may be required depending upon quantity of material.
- B. All surfaces in contact with coating must be preconditioned and maintained below 90°F (32°C) for a minimum of 24 hours.
- C. Cooling of surfaces, materials and equipment can be accomplished by using chilled water for mixing and presoaking concrete. Shade area from direct sunlight or place material when temperatures are decreasing.
- D. Wind breaks shall be provided when necessary to prevent rapid evaporation.

REFERENCE

ACI 305R-91
"Hot Weather Concreting"