



DIVISION 3 - CONCRETE
Section 03730 - Concrete Rehabilitation

Part 1 – General

1.01 Summary

- A. This specification describes the patching of interior and/or exterior vertical and overhead surfaces with a hand-applied, set-accelerated portland cement, repair mortar.

1.02 Quality Assurance

- A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001 Certified and have in existence a recognized ongoing quality assurance program independently audited on a regular basis.
- B. Contractor qualifications: Contractor shall be a qualified in the field of concrete repair and protection with a successful track record of 5 years or more. Contractor shall maintain qualified personnel who have received product training by a manufacturer's representative.
- C. Install materials in accordance with all safety and weather conditions required by manufacturer or as modified by applicable rules and regulations of local, state and federal authorities having jurisdiction. Consult Material Safety Data Sheets for complete handling recommendations.

1.03 Delivery, Storage, and Handling

- A. All materials must be delivered in original, unopened containers with the manufacturer's name, labels, product identification, and batch numbers. Damaged material must be removed from the site immediately.
- B. Store all materials off the ground and protect from rain, freezing or excessive heat until ready for use.
- C. Condition the specified product as recommended by the manufacturer.

1.04 Job Conditions

- A. Environmental Conditions: Do not apply material if it is raining or snowing or if such conditions appear to be imminent. Minimum application temperature 45°F (7°C) and rising.
- B. Protection: Precautions should be taken to avoid damage to any surface near the work zone due to mixing and handling of the specified material.

1.05 Submittals

- A. Submit two copies of manufacturer's literature, to include: Product Data Sheets, and appropriate Material Safety Data Sheets (MSDS).

1.06 Warranty

- A. Provide a written warranty from the manufacturer against defects of materials for a period of one (1) years, beginning with date of substantial completion of the project.

Part 2 - Products

2.01 Manufacturer

- A. **SikaRepair 223**, as manufactured by Sika Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

- A. Portland cement mortar:
 - 1. The repair mortar shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, water reducers for workability, and an organic accelerator.
 - 3. The materials shall be non-combustible, either before or after cure.
 - 4. The materials shall be supplied in a factory-proportioned unit.
 - 5. The portland cement mortar must be placeable from ¼ in. (6 mm) to 1-½ in. (38 mm) in depth per lift for vertical applications and ¼ in. (6 mm) to 1-½ in. (38 mm) in depth per lift for overhead applications.

2.03 Performance Criteria

- A. Typical Properties of the mixed portland cement mortar:
 - 1. Working Time: Approximately 15 - 20 minutes
 - 2. Finishing Time: 20 - 60 minutes
 - 3. Color: concrete gray
- B. Typical Properties of the cured portland cement mortar:
 - 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day: 3,000 psi min. (20.7MPa)
 - b. 7 days: 6,000 psi min. (41.4 MPa)
 - c. 28 days: 7,000 psi min. (48.3 MPa)
 - 2. Flexural Strength (ASTM C-293) at 28 days: 850 psi (5.9MPa)
 - 3. Bond Strength (ASTM C-882 Modified) at 28 days: 1,800 psi (12.4MPa)
 - 4. Splitting Tensile Strength (ASTM C-496) at 28 days: 550 psi (3.8 MPa)
 - 5. The portland cement mortar shall not produce a vapor barrier.

Note: Tests above were performed with the material and curing conditions @ 71° – 75°F (21° - 24°C) and 45-55% relative humidity.

Part 3 – Execution

3.01 Surface Preparation

- A. Substrate must be clean, sound, and free of all loose and deteriorated concrete. The surface must be mechanically prepared. Substrate must have a surface profile of +/- 1/8 in. (3 mm) [to achieve an ICRI CSP-6] with a new aggregate surface. Area to be patched shall not be less than 1/4-in. (6 mm) in depth.
- B. Priming: Prime the prepared substrate with a brush or spray-applied coat of Sika Armatec 110 EpoCem (consult current product data sheet). Alternately, a scrub coat of SikaRepair 223 can be applied prior to placement of the repair mortar. The repair mortar must be applied into the wet scrub coat before it dries.

3.02 Mixing and Application

- A. Mixing the portland cement mortar: Mechanically mix in appropriate sized mortar mixer or with a mud/mortar paddle and low speed (400-600 rpm) drill. Wet down all tools and mixer to be used. Add approximately ¾ gallon of water to mixing container. Slowly add 1 bag of the repair mortar while continuing to mix. Water may be varied up to a maximum one gallon to achieve the desired consistency. DO NOT OVERWET. Total mixing time should not exceed 3 minutes. Mix temperature should be maintained at 65°-75°F (18° - 24°C) by warming or cooling the water, as required.
- B. Placement Procedure: At the time of application, the substrate should be saturated surface dry (SSD) with no standing water. Bonding agent or mortar must be scrubbed into substrate filling all pores and voids. While the bonding agent or scrub coat is still plastic, force material against edge of repair, working toward center. After filling, consolidate, then screed. Allow mortar to set to desired stiffness. Then finish with steel trowel, wood, plastic or sponge float for desired surface texture. Areas where the depth of the repair to sound concrete is greater than 1-½ in. (38 mm) depth vertical or 1-½ in. (38 mm) in depth overhead, repair shall be made in lifts. The top surface of each lift shall be scored so as to produce a roughened surface for the next lift. The preceding lift should be allowed to set before applying fresh material. The fresh mortar must be scrubbed into the preceding lift.
- C. As per ACI recommendations for portland cement concrete, curing is required. Moist cure with wet burlap and polyethylene, a fine mist of water or a water-based* compatible curing compound. Moist curing should commence immediately after finishing. If necessary protect newly applied material from rain. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

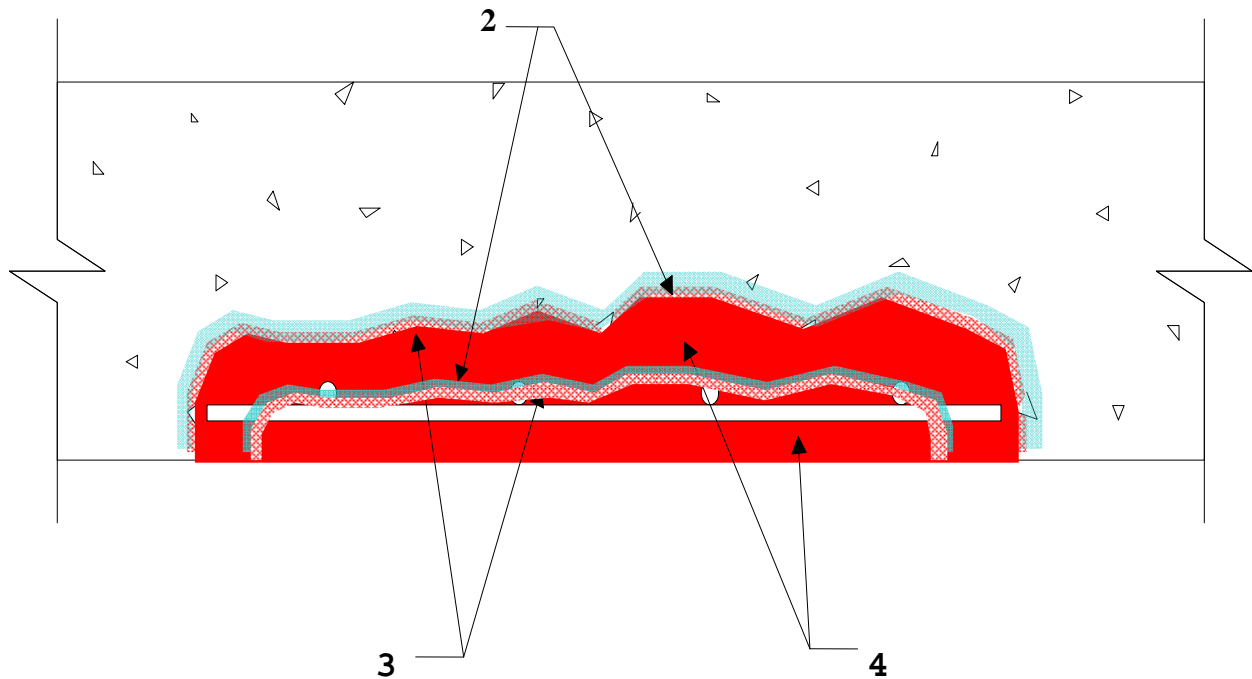
*Pretesting of curing compound is recommended. Water-based curing compound should conform to ASTM C-309.
- D. Adhere to all limitations and cautions for the portland cement mortar in the manufacturer's current product data sheet and literature.

3.03 Cleaning

- A. The uncured portland cement mortar can be cleaned from tools with water. The cured portland cement mortar can only be removed mechanically.
- B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

SC-121

SikaRepair® 223 Hand-applied (Vertical / Overhead)



1. Repair area should not be less than ¼" (6 mm) in depth.
2. Substrate must be saturated surface dry (SSD) with no standing water during application. (Exception: not applicable with Sikadur 32 Hi-Mod epoxy bonding agent)
3. Apply scrub coat to substrate, filling all pores and voids.
4. While scrub coat is still wet apply **SikaRepair 223**.

Note:

1. For applications greater than 1-½ in. (38 mm) [vertical] or 1-½ in. (38 mm) [overhead] in depth, apply **SikaRepair 223** in lifts. Score the top surface of each lift to produce a roughened surface for the next lift. Allow preceding lift to reach set. Repeat from step 2.
2. If repair area is too large to fill while scrub coat is still wet, use Sika Armatex 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)
3. If reinforcing steel is located within the repair location refer to Spec Component SC-201

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