

DIVISION 3 – CONCRETE
Section 03730 - Concrete Rehabilitation

Part 1 – General

1.01 Summary

- A. This specification describes the patching or overlay of interior and/or exterior horizontal surfaces with a polymer-modified, portland cement mortar/concrete.

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 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 (5°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 222**, 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.
 - 2. The materials shall be non-combustible, both before and after cure.
 - 3. The materials shall be supplied in a factory-proportioned unit.
 - 4. The portland cement mortar must be placeable from 1/4-in. to 1-in. in depth per lift for horizontal applications.
- B. To prepare a portland cement concrete: aggregate shall conform to ASTM C-33. The factory-proportioned unit shall be extended with 35-lb. max. of a 3/8 in. (No.8 distribution per ASTM C-33, Table II) clean, well-graded, saturated surface dry aggregate, having low absorption and high density. Aggregate must be approved for use by the Engineer.

2.03 Performance Criteria

- A. Typical Properties of the mixed portland cement mortar:
 - 1. Working Time: Approximately 30 minutes
 - 2. Finishing Time: 50-120 minutes
 - 3. Color: concrete gray
- B. Typical Properties of the cured portland cement mortar:
 - 1. Compressive Strength (ASTM C-109 Modified)
 - a. 1 day: 1800 psi min. (12.4 MPa)
 - b. 7 day: 4000 psi min. (27.6 MPa)
 - c. 28 day: 5000 psi min. (34.5 MPa)
 - 2. Flexural Strength (ASTM C-293) @ 28 days: 750 psi (5.2 MPa)
 - 3. Splitting Tensile Strength (ASTM C-496) @ 28 days 450 psi (3.1 MPa)
 - 4. Bond Strength (ASTM C-882 Modified) @ 28 days: 2000 psi (13.8 MPa)
 - 5. The portland cement mortar shall not produce a vapor barrier.

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

Part 3 – Execution

3.01 Surface Preparation

- A. Areas to be repaired must be clean, sound, and free of contaminants. All loose and deteriorated concrete shall be removed by mechanical means. Mechanically prepare the concrete substrate to obtain a surface profile of +/- 1/16" (CSP 5 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1/4" in depth.
- B. Where reinforcing steel with active corrosion is encountered, sandblast the steel to a white metal finish to remove all contaminants and rust. Where corrosion has occurred due to the presence of chlorides, the steel shall be high pressure washed after mechanical cleaning. Prime steel with 2 coats of Sika Armatec 110 EpoCem as directed by manufacturer. (See Spec Component SC-201-0699)

3.02 Mixing and Application

- A. Mechanically mix in appropriate sized mortar mixer or with a Sika jiffy paddle and low speed (400-600 rpm) drill. Pour approximately 6 pints of water into the mixing container. Add 1 bag of SikaRepair 222 while continuing to mix. Mix to a uniform consistency for a maximum of three minutes.
- B. Mixing of the portland cement concrete: Pour (6 pints) of water into the mixing container. Add 1 bag of SikaRepair 222 while continuing to mix. Add correct amount of the pre-approved coarse aggregate, and continue mixing to a uniform consistency. Mixing time should be 3 minutes maximum. **Note: Water may be varied to achieve the desired consistency. Do not overwater.**
- C. Placement Procedure: At the time of application, the substrate should be saturated surface dry with no standing water. Mortar and/or concrete must be scrubbed into substrate filling all pores and voids. While the scrub coat is still plastic, force material against edge of repair, working toward center. If repair area is too large to fill while scrub coat is still wet use Sika Armatec 110 EpoCem in lieu of scrub coat (See Spec Component SC-200). After filling, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with trowel, manual or power, for smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair is less than 1-inch shall be repaired with portland cement mortar. In areas where the depth of the repair is greater than 1 inch, the repair shall be made with portland cement concrete.
- D. 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. Protect newly applied material from rain, sun, and wind until compressive strength is 70% of the 28-day compressive strength. To prevent from freezing cover with insulating material. Setting time is dependent on temperature and humidity.

*Pretesting of curing compound is recommended.
- E. Adhere to all procedures, limitations and cautions for the portland cement mortar in the manufacturers current printed technical 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.

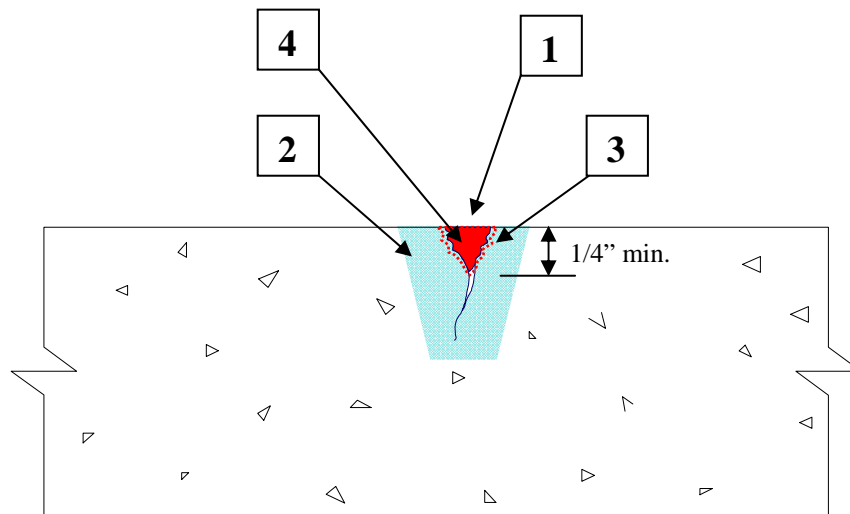
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SikaRepair® 222 Crack Repair

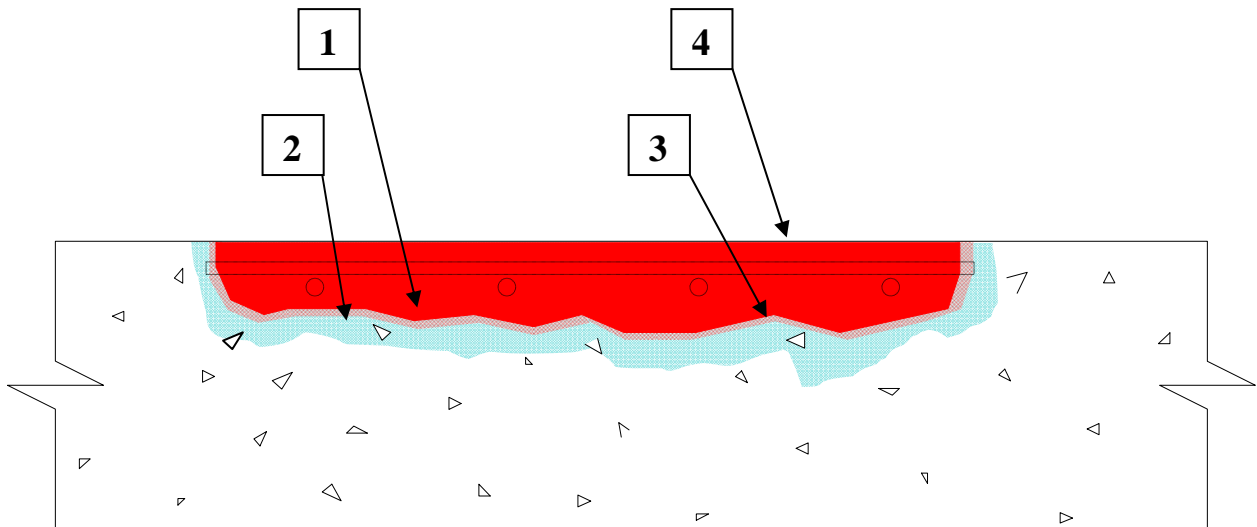


1. Substrate shall be clean, sound and lattinance-free prior to repairing.
2. Pre-soak the substrate to provide saturated surface dry (SSD) condition prior to applying repair material.
3. Apply scrub coat of the repair material to the prepared substrate.
4. While scrub coat is wet place SikaRepair 222, filling the entire cavity. Strike off and finish as required. Wet cure and protect as per the technical data sheet.

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SikaRepair® 222 Hand-applied Repair

1. Substrate shall be clean, sound and lamination-free prior to repairing. (Refer to ICRI Technical Guideline No. 03730.)
2. Pre-soak the substrate to provide saturated surface dry (SSD) condition prior to applying repair material.
3. Apply scrub coat of the repair material to the prepared substrate, filling all pores and voids.
4. While scrub coat is wet place SikaRepair 222, filling the entire cavity. Screed off and finish as required. Wet cure and protect as per the technical data sheet.

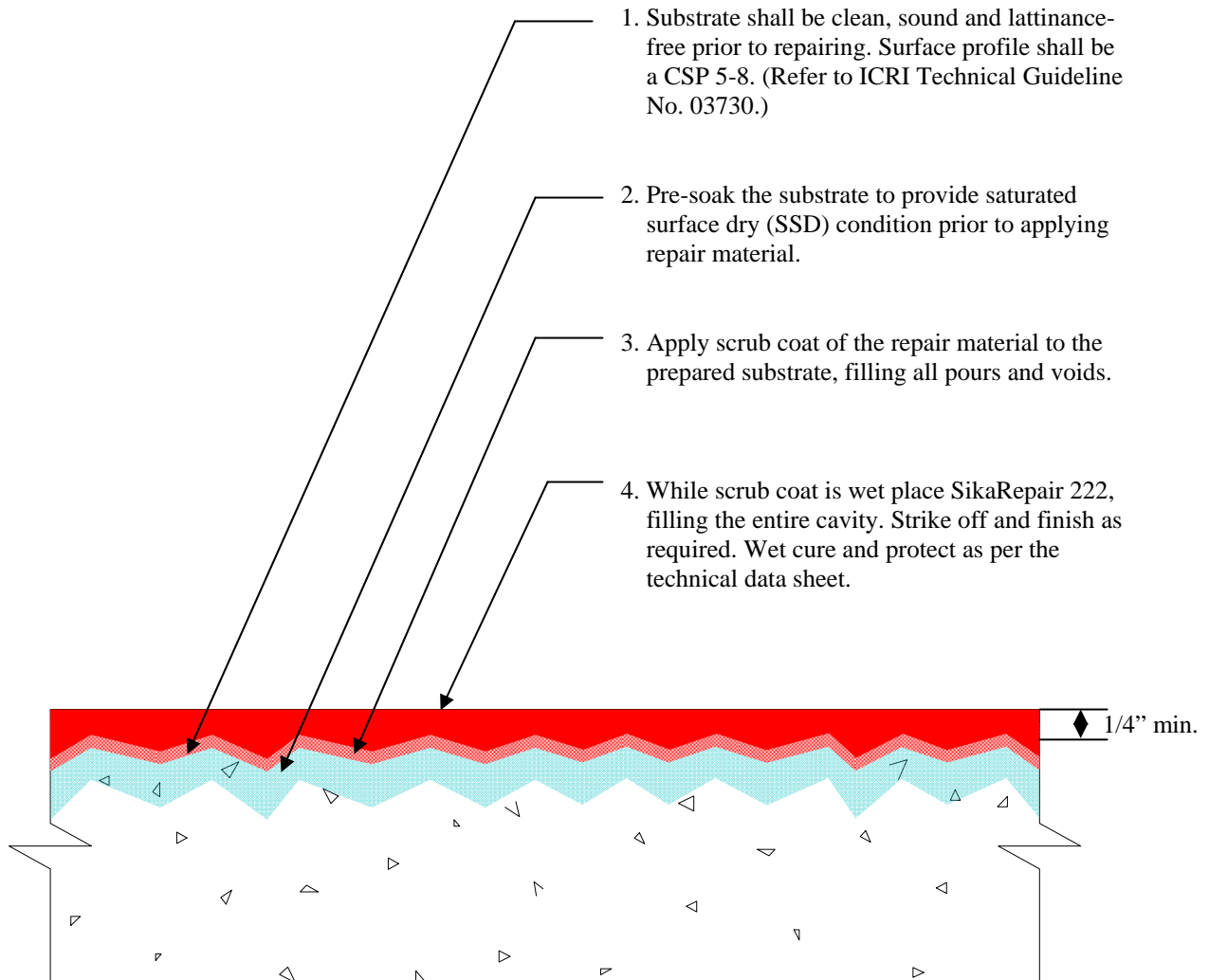


Note:

1. If repair area is too large to fill while scrub coat is still wet, use Sika Armatec 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)
2. If reinforcing steel is located within the repair location refer to Spec Component SC-201
3. For applications greater than 1" in depth, add 3/8" coarse aggregate in accordance to the technical data sheet.

SC-119

SikaRepair® 222 Overlay



Note:

1. If repair area is too large to fill while scrub coat is still wet, use Sika Arimatec 110 EpoCem in lieu of the scrub coat. (See Spec Component SC-200)
2. If reinforcing steel is located within the repair location refer to Spec Component SC-201
3. For applications greater than 1" in depth, add 3/8" coarse aggregate in accordance to the technical data sheet.

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