BUILDING TRUST

Section 03 01 00
Maintenance of concrete

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SIKA SPECIFICATION NOTE: *This guide specification includes test methods, materials and installation procedures for* ***SikaQuick®-1000****, a fast-setting, one-component, self-consolidating mortar with fiber and an integral corrosion inhibitor for form and pour/pump applications.* ***SikaQuick®-1000*** *is a one-component, rapid hardening, early strength gaining, cementitious, patching material for concrete. This guide specification should be adapted to suit the needs and conditions of individual projects. It is prepared in CSI Master Format and should be included as a separate section under Division 3 - Concrete.*
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Part 1 - General

1.01 Summary

This Specification shall be read as a whole by all parties concerned. Each Section may contain more or less the complete Work of any trade. The Contractor is solely responsible to make clear to the Subcontractors the extent of their Work and coordinate overlapping Work.

1.02 System description

This specification describes the patching or overlay of interior and exterior horizontal surfaces and formed vertical and overhead surfaces with Portland Cement Mortar/Concrete.

1.03 Related sections

A. Maintenance of Cast-in-Place Concrete: Section 03 01 30
B. Maintenance of Precast Concrete: Section 03 01 40
C. Maintenance of Cast Decks and Underlayment: Section 03 01 50
D. Maintenance of Mass Concrete: Section 03 01 70
E. Structural Concrete: Section 03 33 00

1.04 References

The following standards are applicable to this section:

- ASTM C-109 - Compressive Strength
- ASTM C-1583 – Direct Pull-Off Bond Strength
- ASTM C-469 - Modulus of Elasticity
- ASTM C-806 – Volume Change
- ASTM C-293 - Flexural Strength
- ASTM C-666 – Freeze-Thaw Resistance

1.05 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 receivced product training by a manufacturer's representative.

C. Store and apply 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 Safety Data Sheets (SDS) for complete handling recommendations.

1.06 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.

1.07 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.

1.08 Submittals

A. Submit two copies of manufacturer's literature, to include: Product Data Sheets (PDS), and appropriate Safety Data Sheets (SDS).
B. Submit copy of Certificate of Approved Contractor status by manufacturer.

1.09 Warranty

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

Part 2 - Products

2.01 Manufacturer

SikaQuick®-1000, as manufactured by Sika® Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

A. General

1) The repair concrete shall be a blend of selected Portland cements, specially graded aggregates, admixtures for controlling setting time, and water reducers for workability and an organic accelerator.

2) The materials shall be non-combustible, both before and after cure.

3) The material shall be supplied as a factory-blended unit.

4) The Portland cement mortar must be placeable from 1/4" to 1" in depth per lift for horizontal applications.

B. To prepare a rapid-setting portland cement concrete: aggregate shall conform to ASTM C-33. The material shall be extended with 30-lb. of a 3/8" (No.8 distribution per ASTM C-33, Table II) clean, well-graded, saturated surface dry aggregate, having low absorption, high density and non-reactive (reference ASTM C-1260, C-227, C-289). Aggregate must be approved for use by the Engineer.

2.03 Performance Criteria

Typical Properties of the mixed polymer-modified, portland cement mortar:

1. Yield	0.42 ft^3 per bag
2. Color	Concrete gray
3. Mixing Ratio	4.5-5 pts per bag
4. Density	136 lbs/ft^3 (2.18 kg/l)
5. Application Thickness	Neat: Min 1/4" (7 mm); Max 2 " (50 mm)
	Extended: Min 1" (25 mm); Max 6 " (152 mm)
6. Application Temp	Min 50ºF (10ºC) ; Max 86ºF (30ºC)
7. Working Time	30 min.
8. Compressive Strength (ASTM C-109)	3 hours – 1,250 psi (8.6 MPa)
	1 day – 4,000 psi (27.6 MPa)
	7 day - 5,000 psi (34.5 MPa)
	28 days - 7,000 psi (48.2 MPa)
9. Flexural Strength (ASTM C-293)	28 day – 1,000 psi (6.9 MPa)
10. Splitting Tensile Strength (ASTM C-496)	28 days - 500 psi (3.4 MPa)
11. Slant Shear (ASTM C-882 Modified)	28 days - 2,500 psi (17.2 MPa)
12. Permeability (ASTM C-1202)	28 days < 1,000 C
13. Shrinkage (157 Modified per ASTM C-928)	28 days - 0.06%
14. Modulus of Elasticity (ASTM C-469)	28 days - 4.6 x 10^6 psi
14. Freeze-Thaw Resistance (ASTM C-666)	98%

Note: Tests above were performed with the material and curing conditions @ 71ºF – 75ºF 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 concrete substrate to obtain a surface profile of ± 1/8" (CSP 6 or greater as per ICRI Guidelines) with a new exposed aggregate surface. Area to be patched shall not be less than 1" 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 per the Product Data Sheet (PDS).

3.02 Mixing and Application

A. Neat: Mechanically mix in appropriate sized mortar mixer or with a Sika jiffy paddle and low speed (400-600 rpm) drill. Pour approximately 4-1/2 pints of water into the mixing container. Add the powder while continuing to mix. Mix to a uniform consistency for a maximum of three minutes. Add up to another ½ pint of water to mix if a greater flow is desired. Should smaller quantities be needed, be sure the proper water/powder ratio is maintained and that the dry material is uniformly blended before mixing the components together. Mix only that amount of material that can be placed in 30 minutes. Do not retemper material.

B. Extended: Pour 4-1/2 to 5 pints of water into the mixing container. Add the powder 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.

C. Use of SikaLatex R: For latex modified polymer overlay, Sika® Latex R can be substituted for water. Consult Sika® Latex R Product Data Sheet for full product usage guidelines.

D. Placement Procedure: At the time of application, the substrate should be Saturated Surface Dry (SSD) 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. After filling, consolidate, then screed. Allow mortar or concrete to set to desired stiffness, then finish with a trowel for a smooth surface. Broom or burlap drag for rough surface. Areas where the depth of the repair is less than 1" shall be repaired with the neat rapid setting Portland cement mortar. In areas where the depth of the repair is greater than 1", the repair shall be made with the extended rapid-setting Portland cement concrete.

E. 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 and continue for 48 hours. 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.

F. Adhere to all procedures, limitations and cautions for the polymer-modified portland cement mortar in the manufacturers current printed Product Data Sheet (PDS) and literature.

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3.02 Cleaning

A. The uncured portland cement mortar can be cleaned from tools with water. The cured polymer modified 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.

SikaQuick 1000 Hand-applied Repair

Note:

A. If repair area is too large to fill while scrub coat is still wet, use Sikdur® 32 in lieu of the scrub coat.

B. If reinforcing steel is located within the repair location refer to Spec Component SC-201

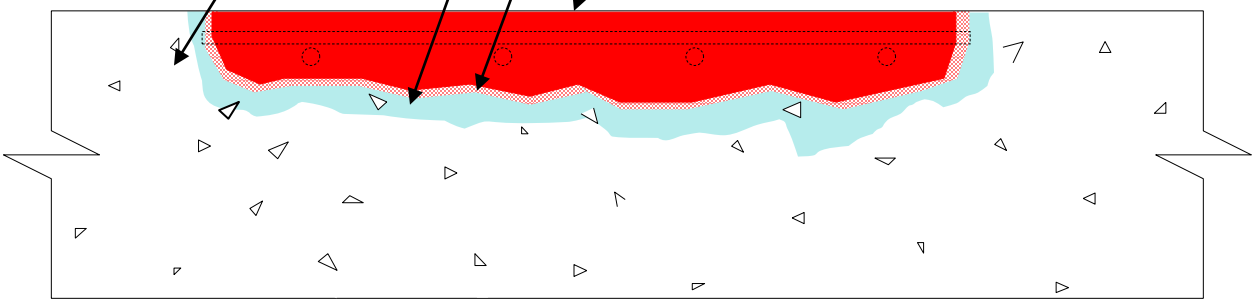
C. For applications greater than 1" in depth, add 3/8" coarse aggregate in accordance to the PDS.

1. Substrate shall be clean, sound and lattinance- 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 or use Sikadur® 32 as boning agent..

3. Apply scrub coat of the repair material to the prepared substrate, filling all pours and voids. If using Sikadur® 32, SSD conditions and scrub coat can be excluded.

4. While scrub coat/ Sikadur® 32 is wet place SikaQuick®-1000 filling the entire cavity. Strike off and finish as required. Wet cure and protect as per the PDS.



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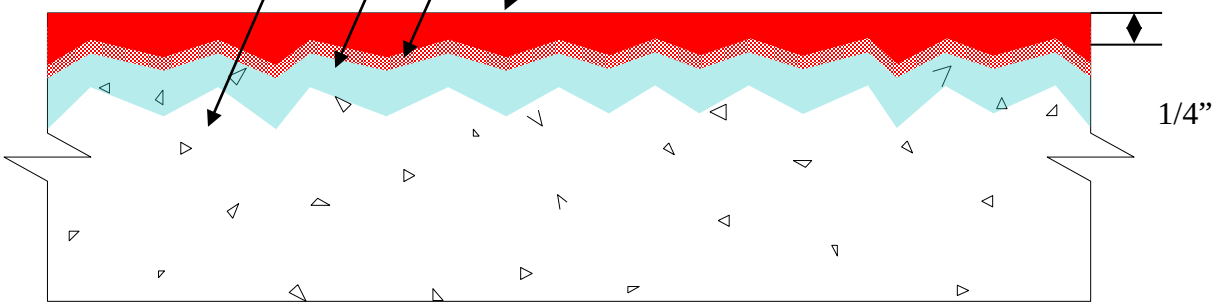
SikaQuick 1000 Overlay

Note:

A. Apply scrub coatof repair material to the prepared substrate, filling all pours and voids.
B. If reinforcing steel is located within the repair location refer to Spec Component SC-201
C. For applications greater than 1” in depth, add 3/8” coarse aggregate in accordance to

1. Substrate shall be clean, sound and lattinance-free prior to repairing. Surface profile shall be a CSP 5-8. (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 pours and voids.
4. While scrub coat is wet place SikaQuick®-1000, filling the entire cavity. Strike off and finish as required. Wet cure and protect as per the PDS



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