



Section 03 01 00 Maintenance of concrete

SIKA SPECIFICATION NOTE: *This guide specification includes test methods, materials and installation procedures for SikaCrete®-211. 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.*

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 Concrete.

1.03 Related sections

- A. Section 03550 - Concrete Toppings
- B. Section 03920 - Concrete Resurfacing
- C. Section 03930 - Concrete Rehabilitation

1.04 References

The following standards are applicable to this section:

- ASTM C-39 - Compressive Strength
- ASTM C-496 - Splitting Tensile Strength
- ASTM C-882 Modified - Slant Shear Bond Strength
- ASTM C-469 - Modulus of Elasticity
- ASTM C-157 Modified- Shrinkage
- ASTM C-293 - Flexural Strength

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 received 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 Material Safety Data Sheets 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

SikaCrete®-211, as manufactured by Sika® Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

- A. The repair concrete shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time, and water reducers for workability.
- B. The materials shall be non-combustible, both before and after cure.
- C. The materials shall be supplied as a factory-blended unit.
- D. The portland cement concrete must be placeable from 1" to 8" in depth and appropriate for full-slab depth repair and replacement.
- E. The portland cement concrete aggregate shall conform to ASTM C-33. (similar to No.8 distribution per ASTM C-33, Table II) and be clean, well-graded, having low absorption and high density.

2.03 Performance Criteria

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

1. Yield	0.65 ft ³ (0.03 m ³) per bag
2. Color	Concrete gray
3. Mixing Ratio	4/5 - 1 gal (3 - 3.76 L) per bag
4. Application Thickness	Min 1" (25 mm); Max 8 " (203 mm)
5. Application Temp	> 45 °F (7 °C)
6. Initial slump (ASTM C-143)	5"-7"
7. Slump at 30 minutes (ASTM C-143)	> 4"
8. Finishing time	30 min
9. Compressive Strength (ASTM C-39)	1 day - 2,000 psi (13.8 MPa) 7 days - 4,500 psi (31.0 MPa) 28 days - 5,000 psi (34.5 MPa)
10. Flexural Strength (ASTM C-293)	28 days - 700 psi (4.8 MPa)
11. Slant shear (ASTM C-882 Modified)	28 days - 1,500 psi (10.3 MPa)
12. Splitting Tensile Strength (ASTM C-496)	28 days - 750 psi (5.2 MPa)
13. Permeability (ASTM C-1202 & AASHTO T-277)	28 days < 1,500 Coloumbs

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 concrete substrate to obtain a surface profile of $\pm 1/8''$ (CSP 7 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.

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 4/5 gallon of water into the mixing container. Add 1 bag while continuing to mix. Mix to a uniform consistency for approximately three minutes.
- B. An additional 1/5 gallon of water may be added for greater flow. Mixing time should be approximately 3 minutes in order to achieve a homogeneous mix. **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. 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. After filling, consolidate, then screed. Allow concrete to set to desired stiffness, then finish with trowel, manual or power, for smooth surface. Broom or burlap drag for rough surface.
- D. Alternatively the material may be poured or pumped into formed areas. To ensure proper filling and adhesion vibrate the material during placement or pump the repair material under pressure. Vibrate form while pouring or pumping. Pump with a variable pressure pump. Continue pumping until a 3 to 5 psi increase in normal line pressure is evident then STOP pumping. Form should not deflect. Vent to be capped when steady flow is evident, and forms stripped when appropriate.
- 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.

F.01 Cleaning

- A. The uncured polymer-modified 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.



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