DIVISION 3 – CONCRETE
Section 03600 - Grouts

Part 1 – General

1.01 Summary

A. This specification describes the grouting of cavities, voids, key ways, etc. with a portland cement, non-shrink, non-metallic grout.

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1.02 Quality Assurance

A. Manufacturing qualifications: The manufacturer of the specified product shall be ISO 9001:2000 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 45ºF (7ºC) 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) year, beginning with date of substantial completion of the project.

Part 2 - Products

2.01 Manufacturer

A. **SikaGrout 212**, as manufactured by Sika Corporation, is considered to conform to the requirements of this specification.

2.02 Materials

A. General

1. The material shall be a blend of selected portland cements, specially graded aggregates, admixtures for controlling setting time and water reducers for workability.
2. The material shall be non-combustible, both before and after cure.
3. The material shall be supplied in a factory-blended bag.

2.03 Acceptable Manufacturers

A. SikaGrout 212, as manufactured by Sika Corporation, Lyndhurst, New Jersey, is considered to conform to the requirements of this specification and has performed satisfactorily for grouting cavities, voids, key ways, etc., for a minimum of five years.

B. Substitutions: The use of other than the specified product will be considered providing the contractor requests its use in writing to the Engineer. This request shall be accompanied by (a) A certificate of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds the specific performance criteria, tested in accordance with the specified test standards; and (b) Documented proof that the proposed substitute product has a five year proven record of performance of grouting cavities, voids, key ways, etc. as confirmed by actual field tests and five successful installations that the Engineer can investigate.

2.04 Performance Criteria

A. Properties of the mixed portland cement grout:

1. Time of Set (ASTM C-191)
   a. Initial Set: 3.0 hours min.
   b. Final Set: 6.5 hours max.
2. Flow (CRD C-621):100-124%
3. Color: concrete gray
4. The grout shall not exhibit bleeding.
5. The grout shall be segregate.
6. The grout shall be pumpable through standard grout pumping equipment.

B. Properties of the cured portland cement grout:

1. Compressive Strength (CRD C-496) at 28 days: 500 psi min.
   a. 1 day: 3800 psi min.
   b. 28 day: 7600 psi min.
2. Splitting Tensile Strength (ASTM C-496) at 28 days: 500 psi min.
3. Flexural Strength (ASTM C-580) at 28 days: 1200 psi min.
4. Bond Strength (ASTM C-882 Modified) Plastic grout to hardened concrete at 28 days (moist cure):1950 psi min.
5. Expansion (CRD C-621) at 28 days: +0.015% min.

6. The grout shall not produce a vapor barrier.
7. The grout shall exhibit positive expansion when tested in accordance to ASTM C-827.
8. The grout shall conform to United States Army Corps of Engineers Specification CRD C-621.
9. The grout shall conform to ASTM C-1107.
10. The material shall be approved by the United States Department of Agriculture.

2.05 Materials

A. Portland cement grout:

1. The portland cement grout shall be a non-shrink, non-metallic composition containing a blend of selected portland cements, plasticizing/water-reducing admixtures and shrinkage compensating agents. The shrinkage agents shall compensate for shrinkage in both the plastic and hardened state.

B. Materials for forming, as required for the designated work, shall be approved by the Engineer.

C. Curing compound, conforming to ASTM C-309, as required for the designated work, shall be approved by the Engineer.

Part 3- Execution

3.01 Mixing and Application

A. Mixing of the portland cement grout: Mix manually or mechanically. Manually mix in a wheelbarrow or mortar box. Mechanically mix with a low-speed (400-600 rpm) drill and jiffy paddle or in an appropriate sized mortar mixer. Add an appropriate quantity of water to the mixing container to achieve the desired consistency. DO NOT OVERWATER While mixing the bag of powder is slowly added to the mixer. Mix to a uniform consistency for a minimum of 2 minutes. Mix temperature should be maintained at 70-75F, thus using cold or warm water accordingly.

B. Placement Procedure:

1. Spalls: Within 15 minutes of mixing, pour the grout into the prepared form. Work in a manner to avoid air entrapment. Vibrate the form as required to achieve flow and compaction. Flowable grout must be confined in either the horizontal or vertical direction, leaving a minimum of exposed surface. After the grout has achieved its final set, remove any forms and trim or shape exposed mortar/concrete to the desired profile, if required.
2. Cracks: Within 15 minutes of mixing pour the grout into prepared crack. Continue pouring until the crack has been completely filled.

C. Wet cure for a minimum of 3 days or apply a curing compound that conforms to ASTM C-309 as approved by the Engineer.

D. Adhere to all limitation and cautions for the polymer-modified portland cement coating in the manufacturers printed literature.

3.02 Cleaning

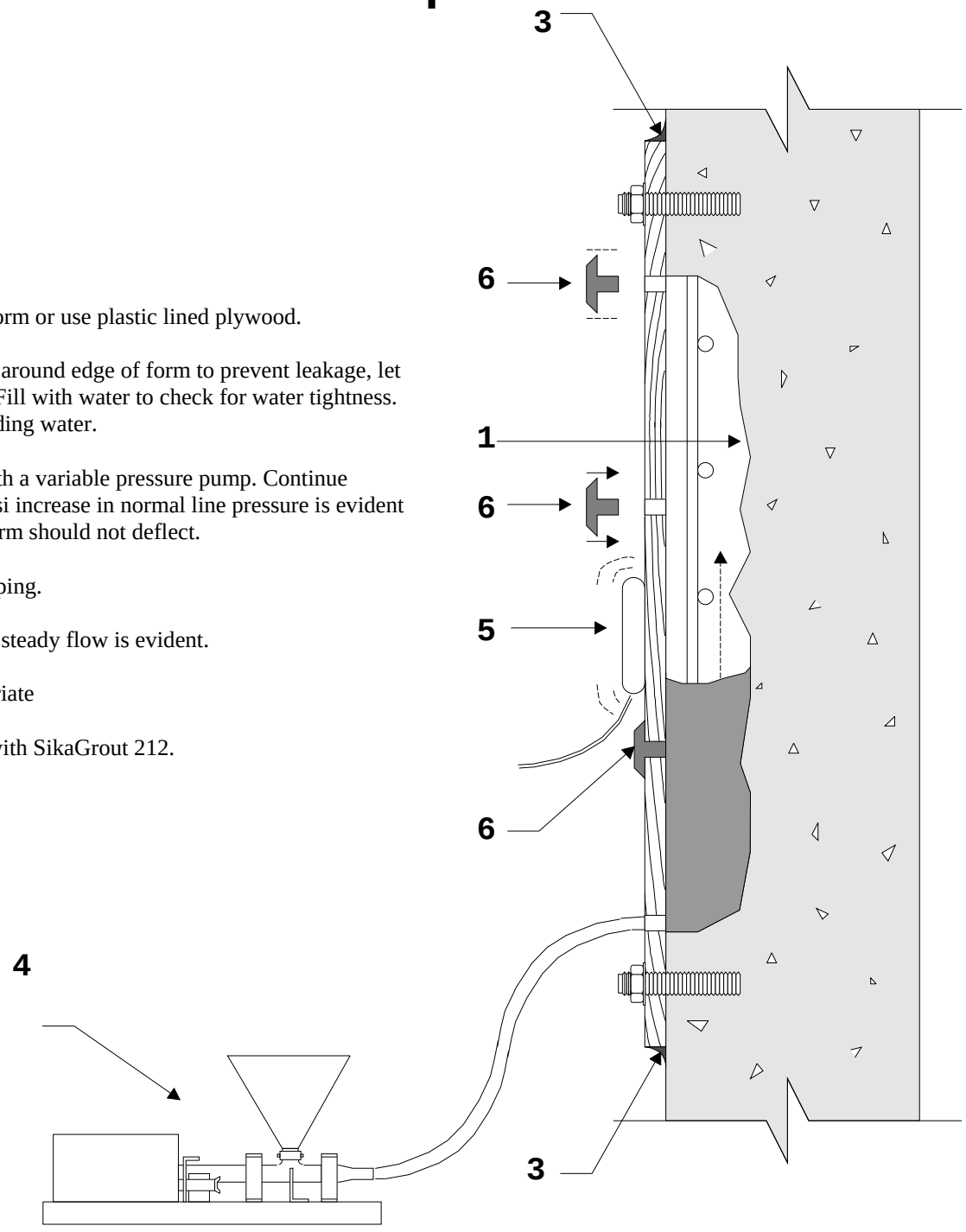
A. The uncured polymer-modified portland cement coating can be cleaned from tools with water. The cured polymer-modified portland cement coating can only be removed mechanically.

B. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

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

SC-046

SikaGrout® 212 Form and Pump



1. Pre-wet surface to SSD.
2. Apply release agent to form or use plastic lined plywood.
3. Run bead of Sikaflex 1a around edge of form to prevent leakage, let cure, then anchor form. Fill with water to check for water tightness. Let drain to no free standing water.
4. Pump SikaGrout 212 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.
5. Vibrate form while pumping.
6. Vent to be capped when steady flow is evident.
7. Strip form when appropriate
8. Dry pack anchor holes with SikaGrout 212.

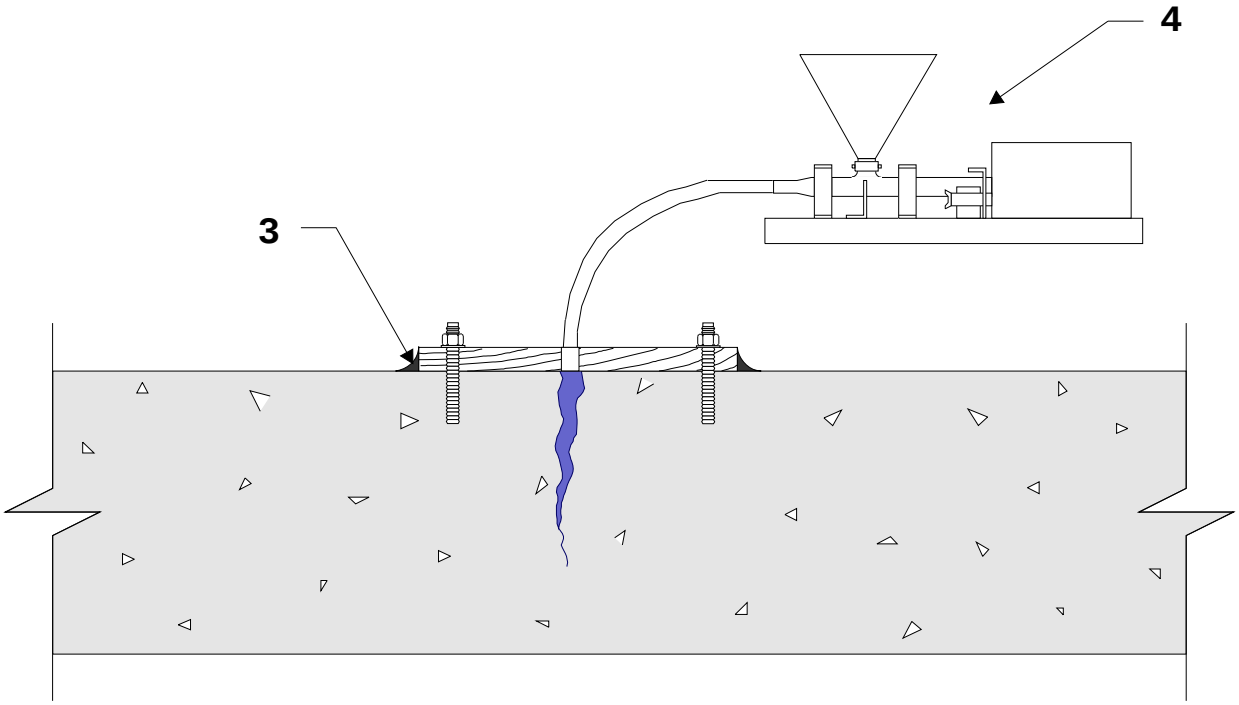
CONCRETE RESTORATION SYSTEMS

Client Name: _____

Job Name: _____

Date: _____

SC-046 SikaGrout® 212 Crack Filler



1. Pre-wet surface to SSD.
2. Apply release agent to form or use plastic lined plywood.
3. Run bead of Sikaflex 1a around edge of form to prevent leakage, let cure, then anchor form.
4. Pump SikaGrout 212 with a variable pressure pump. Continue pumping until grout flow is evident at an adjacent port.
5. Cap off original port when steady flow is evident, move to adjacent port and continue pumping procedure until all injectable cracks have been filled.
6. Strip form when appropriate.
7. Dry pack anchor holes with SikaGrout 212.

CONCRETE RESTORATION SYSTEMS

Client Name: _____

Job Name: _____

Date: _____

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