

SECTION 03 54 20

CEMENT-BASED SELF-LEVELING AND SLOPED UNDERLAYMENT

PART 1 - GENERAL

1.1 DESCRIPTION:

This section specifies cement-based, polymer-modified, self-leveling, and sloped underlayment over existing concrete floors to an average thickness of one-quarter inch for interior finish flooring.

1.2 RELATED WORK:

- A. Materials testing and inspection during construction: Section 01 45 29, TESTING LABORATORY SERVICES.
- B. Resilient Sheet Flooring: Section 09 65 16 RESILIENT SHEET FLOORING.
- C. Resilient Tile Flooring: Section 09 65 19 RESILIENT TILE FLOORING.

1.3 TOLERANCES:

- A. ACI 117.
- B. Slab Finishes: ACI 117, F-number method in accordance with ASTM E1155.

1.4 SUBMITTALS:

- A. Submit in accordance with Section 013400, SAMPLES AND SHOP DRAWINGS.
- B. Product Data: Provide physical characteristics, product limitations, and related data.
- C. Shop Drawings: Plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.

1.5 ENVIRONMENTAL REQUIREMENTS:

- A. Do not install underlayment until floor penetrations and peripheral work are complete.
- B. Maintain minimum ambient temperatures of 50 degrees F 24 hours before, during, and 72 hours after installation of underlayment.
- C. During cure process, ventilate room spaces to remove moisture.

PART 2 - PRODUCTS

2.1 MATERIALS:

- A. Underlayment: Cementitious-based, pre-mixed, factory-packaged, self-leveling product that can be applied in minimum uniform thicknesses of 1/8 inch (3 mm) and that can be feathered at edges to match adjacent floor elevations.
- B. Water: Potable and not detrimental to underlayment mix materials.
- C. Primer: Manufacturer's recommended type.
- D. Sealer: Manufacturer's recommended type.
- E. Joint and Crack Filler: Latex based.
- F. Sand: Silica aggregate meeting system manufacturer's requirements.

G. Additives: None permitted.

2.2 MIXES:

A. Add water to material according to manufacturer's instructions.

B. Mix to achieve following characteristics:

1. Compressive Strength: 1-day - 2,800 psi, 7 days - 4,000 psi, 28 days - 4,800 psi minimum according to ASTM C109.
2. Flexural Strength: 1-day - 500 psi, 28 days - 1,000 psi minimum according to ASTM C348.
3. Pullout Strength: 7 days - 360 psi, 28 days - 440 psi minimum according to CAN/CSA - A232-6B.
4. Abrasion Resistance: 28 days 0.50 grams of loss maximum according to ASTM D4060/Taber H22-500 9,200 cycles.
5. Fire Hazard Classification: Flame/Smoke rating of 0/0 according to ASTM E286.

C. Mix to self-leveling consistency.

D. Mix to maintain slope consistency where slope is required.

E. All components shall come in the mix (i.e. no additives, except water).

PART 3 - EXECUTION

3.1 INSPECTION:

A. Verify material is compatible with finish flooring.

B. Verify substrate surface is ready to receive work of this Section.

C. Utilizing a qualified independent agency, perform anhydrous calcium chloride test, ASTM F 1869. Verify concrete substrates are dry to a maximum moisture content of 3 lb of water/1000 sq. ft. in 24 hours or more stringent as required by underlayment manufacturer.

1. Remove sealers and curing compounds before testing.
2. Maintain the same temperature and humidity conditions as the underlayment will be exposed to for 48 hours before and during testing.
3. Measure at locations uniformly distributed around the slab, with 3 tests for up to 1000 sf and an additional test for each 1000 sf of floor.

D. Apply corrective measures as necessary to bring substrate to within moisture, pH and other tolerances as recommended by flooring manufacturer.

E. Beginning of installation means acceptance of existing substrate and site conditions.

3.2 PREPARATION:

- A. Grind down or shot blast as required to remove humps, ridges, nubs, projections, irregularities beyond fill variance. Fill voids, deck joints and irregularities with filler. Finish smooth. Provide clean, dry, neutral-pH substrate for underlayment application.
 - 1. Treat nonmoving substrate cracks to prevent cracks from telegraphing (reflecting) through underlayment according to manufacturer's written recommendations.
- B. Vacuum clean substrate surfaces. Fill cracks and voids according to manufacturer's instructions.
- C. Mechanically remove laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond according to manufacturer's written instructions.

3.3 INSTALLATION:

- A. Install underlayment according to manufacturer's instructions to indicated minimum and maximum thicknesses. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- B. Install before partition installation. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Provide final feather finish or maximum of 1/8 inch edge with product recommended by Manufacturer to eliminate reflecting of surface through final floor material.

3.4 FLATNESS:

- A. For elevated decks place, consolidate, strike off and level concrete to overall flatness value of F_F 50 and minimum local value of F_F 35 according to ASTM E1155.
- B. Provide test results certified by an independent laboratory indicating actual flatness values achieved within 24 hours after floor is finished. Provide results of testing within 72 hours of tests.
- C. Correct floor slabs failing flatness criteria by grinding, planing, skimming, re-topping, removal or replacement as required to bring flatness and levelness to within specified tolerances.

3.5 PROTECTION AND CURING:

- A. Air cure according to manufacturer's instructions. Prevent contamination during application and curing processes.

- B. Prohibit foot traffic from floor finish for 48 hours after installation. Prohibit heavy machine traffic from floor finish for 7 days after installation.
- C. Repair nicks, gouges, and other imperfections in flooring according to manufacturer's instructions.
- D. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

3.6 FIELD QUALITY CONTROL:

- A. Provide field quality control in areas scheduled to receive self leveling underlayment.
- B. Provide services of manufacturer's representative to direct initial installation of self leveling underlayment to ensure compliance with these Specifications.
- C. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.
- D. Submit written report to COTR along with Close Out documents indicating compliance with this provision.
- E. Slump Test: Test underlayment system for slump as it's being pumped using a 2 inch by 4 inch cylinder resulting is a patty size of 9-1/2 inches plus or minus 1 inch diameter.
- F. Field Samples: Take at least one set of 3 molded cube samples from each day's pour during underlayment application. Test according to ASTM C109. Provide COTR with copy of test results.

3.7 CLEANING:

- A. Remove excess material from floor, base and wall surfaces.
- B. Follow cleaning and maintenance procedures indicated in manufacturer's specifications.

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