

SECTION 03 54 16
HYDRAULIC CEMENT UNDERLAYMENT

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PART I: GENERAL

- A. Cementitious Underlayment for Corrugated Steel Deck Construction.
- B. Hydraulic cement underlayment and surface preparation
- C. Cementitious floor underlayment.
- D. Cementitious self-leveling wearing surface.
- E. Cementitious patching compound.
- F. Cementitious lightweight aggregate fill.

1.2 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete
- B. Section 03 54 00 - Cast Underlayment - Cast Underlayment
- C. Section 09 30 00 - Tiling.
- D. Section 09 60 00 - Flooring.
- E. Section 09 67 13.33 - Conductive Elastomeric Liquid Flooring.
- F. Section 09 80 00 - Acoustic Treatment.

1.3 REFERENCED STANDARDS

- A. The Following Standards and Publications Are Applicable:
 - 1. ASTM C109 Standard Test Methods for Compressive Strength of Hydraulic Cement Mortars.
 - 2. ASTM C33 Standard Specification for Concrete Aggregates (sand aggregate).
 - 3. ASTM D4263 Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
 - 4. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
 - 5. ASTM E119 Standard Test Methods for Fire Tests of Building Construction and Materials.
 - 6. ASTM E413 Rating Classification for Rating Sound Insulation.
 - 7. ASTM E492 Standard Test Method for Laboratory Measurement of Impact Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.
 - 8. ASTM F2678 Standard Practice for Preparing Panel Underlayments, Thick Poured Gypsum Concrete Underlayments, Poured Lightweight Cellular Concrete Underlayments with Underlayment Patching Compounds to Receive Resilient Flooring.
 - 9. TCNA F 180 Tile Council of North America Installation Handbook.
 - 10. NWFA National Wood Flooring Association Instructions.

1.4 SUBMITTALS

- A. Product Data: Submit manufacturer's specifications and installation instructions with project conditions and materials clearly identified or detailed for each required product or system.
- B. Environmental Information: Submit product data for LEED® Credits MR 4 and MR 5, Recycled Content and Regional Materials. Provide documentation indicating percentages, by weight, of post-consumer and pre-consumer recycled content. Also provide documentation substantiating Regional Materials.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Minimum 3-year experience manufacturing similar products.
- B. Installer Qualifications: Installation of BELTER SELF LEVEL PLUS® hydraulic cement underlayment shall be by a Licensed Applicator of BELTERTECH, using mixing and pumping equipment with a water meter approved by BELTERTECH or should have a minimum 2-year experience installing similar products.
- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1. Finish areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship is approved by Architect.
 - 3. Refinish mock-up area as required to produce acceptable work.
- D. Fire Resistance: Provide materials and construction identical to those tested to ASTM E119 by an independent testing agency.
- E. Acoustical Performance: For STC; Provide materials and construction identical those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by and independent testing agency. For IIC; Provide materials and construction identical to those tested in assembly according to ASTM E492.
- F. Manufacturer: All materials, unless otherwise indicated shall be manufactured by BELTERTECH, Hapeville, Georgia.
- G. All materials specified herein shall be approved by BELTERTECH, Hapeville, GA. All others must receive prior approval.

1.6 PRE-INSTALLATION MEETINGS

- A. Convene minimum two weeks prior to starting work of this section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Materials shall be delivered in their original, unopened packages, and protected from exposure to the elements after delivery. Do not allow the bags to get wet.

1.8 PROJECT CONDITIONS

- A. Before, during, and after installation of product, building interior shall be enclosed, with adequate ventilation and heat maintained at a temperature above 50°F (10°C) to allow for drying of product.

1.9 SEQUENCING

- A. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.10 WARRANTY

- A. Certification: Upon completion of this portion of the work, and as a condition of its acceptance, deliver to the architect a certificate from BELTERTECH, and signed by the Licensed Applicator, stating that the material used in this work complies with the specified requirements.

PART II: PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers, subject to all the requirements contained herein.

1. BELTERTECH, Hapeville, GA

2.2 MATERIAL DESCRIPTION

- A. Portland Cement-based Underlayment: BELTER SELF LEVEL PLUS® hydraulic cement underlayment, supplied by BELTERTECH.
- B. Subfloor Primer: BELTER-PRIME® CP Floor Primer or approved equal
- C. Water: Potable and free from impurities
- D. Sealer: BELTER PRIME® Sealer or approved equivalent, as required for glue down finished floors
- E. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

2.3 HYDRAULIC CEMENT UNDERLAYMENTS

- A. Reduced Preparation, Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied from feather edge to 2 inches (52 mm).
1. Product: Subject to compliance with requirements, provide BELTERTECH; BELTER SELF LEVEL PLUS.
- B. Performance Requirements:
1. Cement Binder: ASTM C 150/C 150M, Portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C 219.
 2. Compressive Strength: Not less than 6000 psi (41.4 MPa) at 28 days when tested according to ASTM C 109/C 109M.
- C. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3 to 6 mm); or coarse sand as recommended by underlayment manufacturer.
1. Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.
- D. Water: Potable and at a temperature of not more than 70-degree F (21 degree C).
- E. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.
- F. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.
1. All-Purpose Primer for Self-Leveling Underlayment: BELTER PRIME CP
 2. VOC Content: Provide primer with VOC content of 200 g/L.

1.11 ACCESSORIES

- A. Sound Mat:
1. Product: Subject to compliance with requirements, provide BELTERTECH Corporation: BELTERSONIC SOUND CONTROL MEMBRANE WITH BELTER PRIME CP.

PART III: EXECUTION

3.1 PREPARATION

- A. General: Prepare and clean substrate according to manufacturer's written instructions.
 - 1. Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.
 - 2. Fill substrate voids to prevent underlayment from leaking.
- B. Concrete Substrates: Mechanically remove, according to manufacturer's written instructions, laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants that might impair underlayment bond.
- C. Wood Substrates: Mechanically fasten loose boards and panels to eliminate substrate movement and squeaks. Sand to remove coatings that might impair underlayment bond and remove sanding dust.
 - 1. Install underlayment reinforcement recommended in writing by manufacturer.
- D. Metal Substrates: Mechanically remove, according to manufacturer's written instructions, rust, foreign matter, and other contaminants that might impair underlayment bond. Apply corrosion-resistant coating compatible with underlayment if recommended in writing by underlayment manufacturer.
- E. Nonporous Substrates: For ceramic tile, quarry tile, and terrazzo substrates, remove waxes, sealants, and other contaminants that might impair underlayment bond, and prepare surfaces according to manufacturer's written instructions.
- F. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.
- G. Sound Control Mat and Board: Install sound control materials according to manufacturer's written instructions.
 - 1. Do not install mechanical fasteners that penetrate through the sound control materials.
- H. BELTER SELF LEVEL PLUS® hydraulic cement underlayment is not an encapsulant. Consult local and Federal authorities for proper removal of asbestos.
- I. The General Contractor (GC) shall confirm that the subfloor is adequately sound (a deflection limit of L/360) and conditions are suitable for installation of floor underlayment screed.
- J. Subfloor shall be properly prepared, sound, dimensionally stable, fully cured and at least 28 days old, and free from hydrostatic pressure.
- K. Consult floor covering manufacturer for maximum allowable Moisture Vapor Emission Rate (MVER) and retained moisture in substrate.
- L. Ambient room temperature shall be between 50° - 90°F (10° - 32°C) before, during, and after BELTER SELF LEVEL PLUS® hydraulic cement underlayment installation.
- M. Provide for expansion joints where specified, including the perimeter of the room, columns, supports, and equipment pedestals. Don't bridge joints. Ensure control joints are honored through BELTER SELF LEVEL PLUS® hydraulic cement underlayment and primer.
- N. All dormant cracks in the substrate greater than 1/8-inch (3 mm) shall be repaired to minimize telegraphing through the underlayment.
- O. Leak Prevention: All cracks and voids should be filled with a quick-setting patching or taping compound, or equal, where leakage may occur.
- P. BELTER PRIME® CP Floor Primer is always required over substrates. Prime wood subfloors with one coat of BELTER PRIME® SP Floor Primer (diluted 4:1 with water) using one gallon of primer solution (approx. 3.79 L) per 300 ft² (approx. 47m²) or BELTERTECH approved substitute primer.

- Q. Installation of BELTER SELF LEVEL PLUS® hydraulic cement underlayment shall not begin until the building is enclosed, including roof, windows, doors, and other openings.
- R. BELTER SELF LEVEL PLUS® hydraulic cement underlayment shall be installed before or after the installation of drywall, as specified.

3.2 INSTALLATION

- A. Mixing Requirements: Refer to Applicator Installation manual and packaging instruction for specified water requirements.
 - 1. BELTER SELF LEVEL PLUS® hydraulic cement underlayment mix proportions, mix designs and methods shall be in strict accordance with BELTERTECH's recommendations.
- B. Application: The minimum thickness of BELTER SELF LEVEL PLUS® hydraulic cement underlayment varies with the type of subfloor. Over wood subfloors, a minimum of 3/4-inch (approx. 19 mm) with mechanically attached mesh is required. Over precast or poured-in-place concrete, a minimum of 1/2-inch (approx. 13 mm) is required. Can be featheredged at transitional locations. Maximum recommended thickness is 2-inch (51 mm) in one lift.
- C. BELTER SELF LEVEL PLUS hydraulic cement underlayment screed is suitable for interior applications only and must be covered by a finished floor material.
- D. Protection: After installation, temporary wood planking shall be placed by the GC wherever the floor underlayment will be subject to wheeled or concentrated loads.
- E. Curing and Drying: BELTER SELF LEVEL PLUS® hydraulic cement underlayment screed is designed to self-cure. Do not use damp cure methods or sealers. Follow the following procedures for optimum performance:
 - 1. Protect the floor from excessive heat and drafts during curing.
 - 2. Avoid walking on surface for 2-3 hours. (Adjust for varying temperature and humidity conditions.)
 - 3. Consult flooring contractor for recommended procedures to test for dryness.
- F. Sealing: Seal all areas that receive glue down floor goods with BELTER PRIME® Sealer or approved equivalent according to the specifications. Any floor areas where the surface has been damaged shall be cleaned and sealed regardless of the floor covering used. Where a floor good manufacturer requires a special adhesive or installation, their requirements supersede these specifications.
- G. Field Quality Control:
 - 1. Slump Test: BELTER SELF LEVEL PLUS® hydraulic cement underlayment screed shall be tested for slump at the beginning of each installation in order to establish the required slump. Slump tests shall then be taken periodically during installation to verify that the required slump is maintained. Slump tests shall be conducted using a 2-inch by 4-inch (approx. 51 mm by 102 mm) cylinder.
 - 2. Field Samples: Testing shall be done in accordance with modified ASTM C109 testing procedures, using 2-inch (approx. 51 mm) split brass molds. Prior to independent sampling, contact BELTERTECH, to ensure that proper ASTM procedures are followed. If requested prior to installation, test results shall be available to the architect and/or contractor from the Licensed Applicator.

3.3 PREPARATION FOR FINISHED FLOOR

- A. Please refer floor good manufacturer guidelines for Installing Finished Floor Coverings.

Warranty: Beltertech, Inc. warrants Beltertech Screed Flooring systems to be free from manufacturing defects, and when properly prepared and installed according to approved specified methods, Beltertech Flooring Systems will attain minimum physical specifications as stated by Beltech, Inc.'s most recent literature. Beltertech, Inc.'s obligation shall be limited to the replacement of the bagged product only and is subject to notice and inspection requirements. This warranty is in lieu of all other warranties, express or implied, including the warranties of merchantability and fitness for a particular purpose and all other obligations or liabilities.