

## SECTION 03 54 16 – HYDRAULIC CEMENT UNDERLAYMENT

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## PART 1 - GENERAL

## 1.1 SUMMARY

## A. Section Includes:

1. Hydraulic-cement-based floor leveling underlayments
2. Primer for underlayments

## 1.2 RELATED SECTIONS

## A. The following Section(s) contain work related to the work of this Section:

1. Section 03 30 00 – Cast-in-Place Concrete: General requirements for mixing, placing, and finishing cast-in-place concrete floor slabs.
2. Section 03 53 00 – Concrete Topping: Cementitious topping compounds designed for industrial and traffic-bearing applications.
3. Division 09 Sections for finish flooring to be applied over cement underlayments.

### 1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM)
  - 1. ASTM C 109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars.

### 1.1 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.
- B. Review scope of Work expected. Require representatives of each entity directly concerned with concrete slab work to attend, including the following:
  - 1. Contractor's superintendent.
  - 2. Installer
  - 3. Underlayment manufacturer's representative.
  - 4. Architect's and/or Owner's representative (at their option).
- C. Review the following, at a minimum:
  - 1. Schedule
  - 2. Extent of Work.
  - 3. Materials to be installed.
  - 4. Procedures to be used for surface prep and material application
  - 5. Material storage and staging.
  - 6. Temporary heating and tenting.
  - 7. Cleanup and disposal of waste materials.

### 1.2 ACTION SUBMITTALS

- A. General: Submit the following for approval. Do not proceed with work involving any action submittal until approval is obtained.
- B. Product Data: Technical data sheets for each product used. Include material physical characteristics, storage and application instructions, precautions and safety data, cleanup, and maintenance information.

### 1.3 INFORMATIONAL SUBMITTALS

- A. General: Submit the following to the Owner for the Owner's information and records. If acceptable, and unless otherwise indicated, Informational Submittals will not be acted upon or returned.
- B. Safety Data Sheets (SDS) for all products used.
- C. Qualification Data: For Installer.

- D. Photographs: Submit photographic documentation of existing conditions prior to commencing work. Indicate extent of concrete repair work to be performed.
- E. LEED Submittals:
  - 1. Product Data for EQ credit Low-Emitting Materials: For products of this Section containing volatile organic compounds (VOC), including materials with zero VOC content.

#### 1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company regularly engaged in the manufacturing of the products specified in this section, with at least 10 years' successful history manufacturing material specified herein.
- B. Installer Qualifications: Installer who is approved by, or acceptable to manufacturer for application of underlayment products required for this Project, with at least five (5) years' experience in application of cementitious underlayments.

#### 1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in original factory packaging, bearing identification of product, manufacturer, batch number, and expiration date.
  - 1. Furnish Safety Data Sheets to the project superintendent for each product.
- B. Store products in a location protected from damage, construction activity, precipitation and direct sunlight, in strict accordance with the manufacturer's recommendations.
  - 1. Do not allow liquid products to freeze.
  - 2. Use products within published shelf life.
- C. Handle all products with appropriate precautions and care as stated on the Safety Data Sheet.

#### 1.6 PROJECT CONDITIONS

- A. Do not use products under conditions of precipitation or freezing weather. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations if application during inclement weather occurs.
- B. Apply hydraulic cement underlayment underlayments only when surface and ambient temperatures are between 40 degrees F (**4 degrees C**) and 90 degrees F (**32 degrees C**).
- C. Protect adjacent work from contamination due to mixing, handling, and application of underlayment and priming materials.

## PART 2 - PRODUCTS

## 2.1 MANUFACTURERS

## A. Acceptable Manufacturers:

1. Dayton Superior Corporation; 1125 Byers Road, Miamisburg, Ohio 45342; Tel: (877) 266-7732; Website: www.DaytonSuperior.com

B. Requests for substitutions will be considered in accordance with provisions of Section **[01 25 00]** **[01 60 00]**.

## C. Substitutions: Not permitted.

## 2.2 MATERIALS

A. Regular Strength Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/8 inch **(3 mm)** and that can be feathered at edges to match adjacent floor elevations.

1. Product: Dayton Superior "Econolevel":
  - a. Compressive Strength: Not less than 4100 psi **(29 MPa)** at 28 days when tested according to ASTM C 109/C 109M.
  - b. Aggregate for Extending Depth: Well-graded, washed gravel, 1/4 to 3/8 inch **(6 to 9.5 mm)**; or coarse sand as recommended by underlayment manufacturer.

B. High Compressive Strength Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/8 inch **(3 mm)** and that can be feathered at edges to match adjacent floor elevations.

1. Product: Dayton Superior "LeveLayer":
  - a. Compressive Strength: Not less than 5000 psi **(34.5 MPa)** at 28 days when tested according to ASTM C 109/C 109M.
  - b. Aggregate for Extending Depth: Well-graded, washed gravel, 1/4 to 3/8 inch **(6 to 9.5 mm)**; or coarse sand as recommended by underlayment manufacturer.

C. Thin Resurfacer Hydraulic Cement Underlayment: Polymer-modified, trowel-applied, hydraulic cement product that can be applied in thicknesses from featheredge to 1/2 inch **(12.7 mm)**.

1. Product: Dayton Superior "Sure Finish":
  - a. Compressive Strength: Not less than 4000 psi **(27.6 MPa)** at 28 days when tested according to ASTM C 109/C 109M.

D. Water: Potable and at a temperature of not more than **70 deg F (21 deg C)**.

When applied over wood, some manufacturers recommend reinforcing their products; consult manufacturers. Retain "Reinforcement" Paragraph below if applicable.

- 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. Basis-of-Design Product: Subject to compliance with requirements, provide Dayton Superior; Level Primer J42/J42RTU.

Retain "VOC Content" Subparagraph below if required.

- 2. VOC Content: Provide primer with VOC content less than 50 g/L.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Examine substrates, with Installer present, for conditions affecting performance of the Work.
- B. Proceed with application only after unsatisfactory conditions have been corrected.

#### 3.2 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.

If underlayments are installed over adhesive residues, consult manufacturers for recommendations and revise "Concrete Substrates" Paragraph below.

- 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.

Retain "Moisture Testing" Subparagraph below if required by manufacturer for underlayment placed on hardened concrete slabs.

- 1. Moisture Testing: Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. **(1.36 kg of water/100 sq. m)** in 24 hours.

Consult Dayton Superior Technical Services for underlayment applications over wood substrates.

- 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.

Retain subparagraph below if applicable.

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.

### 3.3 UNDERLAYMENT APPLICATION

Indicate underlayment thicknesses on Drawings or insert requirements in this article.

- A. General: Mix and apply underlayment components according to manufacturer's written instructions.
  1. Close areas to traffic during underlayment application and for time period after application recommended in writing by manufacturer.
  2. Coordinate application of components to provide optimum adhesion to substrate and between coats.

Retain subparagraph below for moving joints in floor. Detail joints on Drawings and revise below to suit Project.

3. At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.
- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply underlayment to produce uniform, level surface.
  1. Feather edges to match adjacent floor elevations.

Retain subparagraph below if addition of aggregate is required for thickness indicated.

- D. If aggregate is used to increase thickness, apply a final layer without aggregate to product surface.
- E. Cure underlayment according to manufacturer's written instructions. Prevent contamination during application and curing processes.
- F. Do not install floor coverings over underlayment until after time period recommended in writing by underlayment manufacturer.

Retain first paragraph below if surface sealer is required in this Section.

- G. Apply surface sealer at rate recommended by manufacturer.
- H. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.

#### 3.4 THIN RESURFACER APPLICATION

- A. Thoroughly clean substrate of dust, dirt, debris, and previous coatings.
- B. Prime surface prior to resurfacer application only if recommended by manufacturer.
- C. Apply resurfacer material by trowel per manufacturer's recommendations. Force material into cracks, voids, and defects.
- D. Apply to thickness indicated or required to achieve final surface level. Apply in multiple lifts, if necessary, allowing drying/curing time between applications as directed. Broom finish intermediate lifts to promote adhesion of subsequent lifts.

#### 3.5 PROTECTION

- A. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 03 54 16