SECTION 035416 - HYDRAULIC CEMENT UNDERLAYMENT

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Polymer-modified, self-leveling, hydraulic cement underlayment for application below interior floor coverings.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" Paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

If needed, insert list of conference participants.

**<Insert participants>**.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For the following:

Hydraulic cement underlayment.

Reinforcement.

Primer.

Corrosion-resistant coating.

Surface sealer.

Sound control mat.

* + - * 1. Sustainable Design Submittals:

Retain "Shop Drawings" Paragraph below if survey of existing conditions is required.

* + - * 1. Shop Drawings: Include plans indicating substrates, locations, and average depths of underlayment based on survey of substrate conditions.

Coordinate "Qualification Data" Paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.
				2. Test Reports:

For fire-resistant ratings, from a qualified testing agency.

For STC-rated assemblies, from a qualified testing agency.

For IIC-rated assemblies, from a qualified testing agency.

* + - 1. QUALITY ASSURANCE

Some manufacturers approve installers; others do not. Revise "Installer Qualifications" Paragraph below to suit products selected.

* + - * 1. Installer Qualifications: Installer who is approved by manufacturer for application of underlayment products required for this Project.
			1. FIELD CONDITIONS
				1. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ventilation, ambient temperature and humidity, and other conditions affecting underlayment performance.

Place hydraulic cement underlayments only when ambient temperature and temperature of substrates are between 50 and 80 deg F.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Fire-Resistance Ratings" Paragraph below only if products specified are part of a fire-resistance-rated assembly. Indicate rating, testing agency, and testing agency's design designation on Drawings.

* + - * 1. Fire-Resistance Ratings: Comply with ASTM E119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

Retain "STC-Rated Assemblies" Paragraph below if hydraulic cement underlayment is part of STC-rated assemblies. Indicate design designations of specific assemblies on Drawings. The IBC requires a minimum STC of 50 (45 if field tested) for airborne sound transmission between adjacent dwelling units or between public areas and dwelling units.

* + - * 1. STC-Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

STC Rating: **[60] [55] [50] [As indicated on Drawings]**.

Retain "IIC-Rated Assemblies" Paragraph below if hydraulic underlayment is part of impact insulation class- (IIC) rated assemblies. Indicate design designations of specific assemblies on Drawings. The IBC requires a minimum IIC of 50 (45 if field tested) for structure-borne sound transmission between adjacent dwelling units or between public areas and dwelling units.

* + - * 1. IIC-Rated Assemblies: For IIC-rated assemblies, provide materials and construction identical to those tested in assembly indicated, according to ASTM E492 and classified according to ASTM E989 by an independent testing agency.

IIC Rating: **[60] [55] [50] [As indicated on Drawings]**.

* + - 1. HYDRAULIC CEMENT UNDERLAYMENTS

Minimum thickness indicated in "Hydraulic Cement Underlayment" Paragraph below indicates capability of material, generally over concrete. Required minimum thickness for application depends on substrate and type of floor covering to be applied. Wood substrates, for example, will require greater minimum thickness. In addition, numerous manufacturers make products with differing compressive strengths, cure times, and suitability for use with radiant flooring. Consult manufacturers.

* + - * 1. Hydraulic Cement Underlayment: Polymer-modified, self-leveling, hydraulic cement product that can be applied in minimum uniform thickness of 1/4 inch and that can be feathered at edges to match adjacent floor elevations.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

Allied Custom Gypsum Plasterworks, LLC.

ARDEX Americas.

BASF Corporation.

Dayton Superior.

Euclid Chemical Company (The); an RPM company.

Maxxon Corporation.

USG Corporation.

Approved equivalent.

Cement Binder: ASTM C150, portland cement, or hydraulic or blended hydraulic cement as defined by ASTM C219.

Revise "Compressive Strength" Subparagraph below to suit Project; consult manufacturers. Products are available in a range of strengths; retain one option or insert value in subparagraph.

Compressive Strength: Not less than [4000 psi] [5000 psi] [6000 psi] at 28 days when tested according to ASTM C109.

Retain "Underlayment Additive" Subparagraph below if required. Some manufacturers recommend additives for applications over cutback adhesive or wood and metal substrates.

Underlayment Additive: Resilient-emulsion product of underlayment manufacturer, formulated for use with underlayment when applied to substrate and conditions indicated.

Retain "Aggregate" Paragraph below if addition of aggregate filler is required by manufacturer to achieve thickness indicated. Coordinate aggregate size with depth of underlayment.

* + - * 1. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch; or coarse sand as recommended by underlayment manufacturer.

Provide aggregate when recommended in writing by underlayment manufacturer for underlayment thickness required.

* + - * 1. Water: Potable and at a temperature of not more than 70 deg F.

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

* + - * 1. Reinforcement: For underlayment applied to wood substrates, provide galvanized metal lath or other corrosion-resistant reinforcement recommended in writing by underlayment manufacturer.
				2. Primer: Product of underlayment manufacturer recommended in writing for substrate, conditions, and application indicated.

Retain "Corrosion-Resistant Coating" Paragraph below for metal substrates. Some manufacturers do not recommend using their products over metal.

* + - * 1. Corrosion-Resistant Coating: Recommended in writing by underlayment manufacturer for metal substrates.

Retain "Surface Sealer" Paragraph if required. Confirm compatibility with floor coverings and floor covering adhesives specified in Division 09 Sections.

* + - * 1. Surface Sealer: Designed to reduce porosity as recommended by manufacturer for type of floor covering to be applied to underlayment.
			1. ACCESSORIES
				1. Sound Control Mat: As required to meet STC and IIC ratings, manufactured by gypsum cement underlayment manufacturer.

Thickness: **[1/8 inch] [1/4 inch] [3/8 inch] [3/4 inch]**.

1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, with Installer present, for conditions affecting performance of the Work.
				2. Proceed with application only after unsatisfactory conditions have been corrected.
			2. PREPARATION
				1. Prepare and clean substrate according to manufacturer's written instructions.

Treat nonmoving substrate cracks according to manufacturer's written instructions to prevent cracks from telegraphing (reflecting) through underlayment.

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.

* + - * 1. 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 concrete slabs.

Moisture Testing: Perform tests so that each test area does not exceed **[200 sq. ft.] [1000 sq. ft.]**, and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Retain "Anhydrous Calcium Chloride Test, ASTM F1869" or "Relative Humidity Test" Subparagraph below, or both.

Anhydrous Calcium Chloride Test, ASTM F1869: Proceed with installation only after substrates do not exceed a maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.

Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 85 percent relative humidity level measurement, or as recommended by hydraulic cement underlayment manufacturer.

* + - * 1. 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.

Install underlayment reinforcement recommended in writing by manufacturer.

* + - * 1. 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.
				2. 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.
				3. Adhesion Tests: After substrate preparation, test substrate for adhesion with underlayment according to manufacturer's written instructions.

Retain "Sound Control (Mat) (and) (Board)" Paragraph below if sound control material is required.

* + - * 1. Sound Control **[Mat] [and] [Board]**: Install sound control materials according to manufacturer's written instructions.

Do not install mechanical fasteners that penetrate through the sound control materials.

* + - 1. INSTALLATION

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

* + - * 1. Mix and install underlayment components according to manufacturer's written instructions.

Close areas to traffic during underlayment installation and for time period after installation recommended in writing by manufacturer.

Coordinate installation 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.

At substrate expansion, isolation, and other moving joints, allow joint of same width to continue through underlayment.

* + - * 1. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
				2. Install underlayment to produce uniform, level surface.

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

Install a final layer without aggregate to product surface.

Feather edges to match adjacent floor elevations.

* + - * 1. Cure underlayment according to manufacturer's written instructions. Prevent contamination during installation and curing processes.
				2. 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.

* + - * 1. Apply surface sealer at rate recommended by manufacturer.
				2. Remove and replace underlayment areas that evidence lack of bond with substrate, including areas that emit a "hollow" sound when tapped.
			1. INSTALLATION TOLERANCES

Fourth option in paragraph below is requirement for gauged porcelain tile.

* + - * 1. Finish and measure surface, so gap at any point between gypsum cement underlayment surface and an unleveled, freestanding, 10-foot- long straightedge resting on two high spots and placed anywhere on the surface does not exceed **[1/4 inch] [3/16 inch] [1/8 inch] [1/8 inch and 1/16 inch in 2 feet]**.
			1. PROTECTION
				1. Protect underlayment from concentrated and rolling loads for remainder of construction period.

END OF SECTION 035416