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SECTION 03 30 00

CRYSTALLINE CONCRETE WATERPROOFING ADMIXTURE

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnish all labor, materials, tools and equipment as necessary to perform incorporation of Crystalline Waterproofing Admixture for concrete mix. Admixture shall be added to the concrete mix at the batching plant or to the ready-mix-truck at job site as per manufacturer's instructions.
- B. Related Sections: *(Delete or add necessary Sections)*
 - 1. Section 033000 – Cast-in-Place Concrete.

1.2 REFERENCES

- A. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
- B. ASTM C 293 Standard Test Method for Flexural Strength of Concrete (using Simple Beam with Center Point Loading).
- C. ASTM C 496 Standard Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens
- D. ACI 308 Standard for Curing of Concrete.
- E. COE CRD-C 48 Method of Test for Water Permeability of Concrete; U.S. Army Corps of Engineers.
- F. NSF/ANSI Standard 61 Drinking Water System Components = Health Effects.

1.3 SUBMITTALS

- A. General:
Submit manufacturer's certification that proposed materials, details and systems as indicated and specified fully comply with manufacturer's details and specifications. If any portion of Contract Documents does not conform to manufacturer's standard recommendations, submit notification of portions of design that are at variance with manufacturer's specifications.
- B. Compatibility:
Submit manufacturer's certification that proposed material is compatible with concrete mix design.

- C. Product Data:
Submit manufacturer's product data, installation instructions and SDS for product.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications:
 - 1. Company specializing in manufacturing crystalline concrete waterproofing products with minimum 15 years documented experience.
 - 2. Depending on geographical location of job site, capable of providing field service representation during construction and approving application method.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver and store materials in a dry area. Handle and protect from contamination in accordance with manufacturer's instructions.
- B. Deliver materials in manufacturer's unopened containers, fully identified with brand, type, grade, class and all other qualifying information. Provide Safety Data Sheet.

1.6 SYSTEM REQUIREMENTS

- A. Provide materials and accessories in timely manner so as not to delay Work.

1.7 PRE-INSTALLATION CONFERENCE AND TRIAL MIXES

- A. Convene pre-installation conference at the Contractor's direction prior to commencing work to review methods and sequence of installation. The meeting shall include the Engineer, Contractor and/or Subcontractor, Manufacturer's Representative. Requirement for manufacturer's representative may be waived if Contractor provides sufficient evidence that Producer and Finisher have adequate experience with admixture required.
- B. Trial mixes shall be carried out with proposed mix design to insure that mix meets all requirements set forth in the specification, prior to actual installation of concrete.

1.8 WARRANTY

- A. Provide 10-year manufacturer's limited material warranty for the crystalline waterproofing powder admixture.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Approved Manufacturer: AQUAFIN, Inc. 505 Blue Ball Rd., #160, Elkton, MD, 21921
Phone (800) 394-1410 or (410) 392-2300, Fax (410) 392-2324; e-mail info@aquafin.net.

- B. Requests for substitutions will be considered only if submitted to the architect/engineer in writing 10 days prior to bid date, and must include substantiation of product performance.

2.2 MATERIALS

- A. Crystalline Integral Waterproofing Admixture: Permeability-reducing admixture for hydrostatic conditions (PRAH) as defined by ACI 212.3R-10, Chapter 15. Powder waterproofing admixture with the following characteristics:
 - 1. Product: with retarder Aquafin®-IC ADMIX-Powder.
without retarder IC-ADMIX-Powder-NR.
 - 2. Aggregate state: Powder – non corrosive.
 - 3. Compressive Strength:(ASTM C-39)Treated concrete must have equal or higher values than plain concrete.
 - 4. Splitting Tensile Strength: (ASTM C-496) Treated concrete must have equal or higher values than plain concrete.
 - 5. Flexural Strength: (ASTM C-293) Treated concrete must have equal or higher values than plain concrete.
 - 6. Self-Sealing: Autogenous crack sealing of treated concrete for static (non-moving) cracks with width of up to 1/64" (0.4 mm) or greater.
 - 7. Permeability: (COE CRD-C 48) Tested at 460 feet (140 m) water head, or 200 psi (14 bars) water pressure.
 - 8. Potable water contact certification:As per NSF/ANSI Standard 61, where necessary.

2.3. ACCESSORIES

- A. Joint Devises: AQUAFIN-Waterstop.
- B. Leak Repair Products for leaking and defective concrete assemblies:
AQUAFIN-InjectPro PU and/or Acrylate injection chemical grouting.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

- A. Assure that concrete mix design and proposed material are in compliance with manufacturer's recommendations.
 - 1. Dosage rate of the waterproofing admixture shall be 0.8% - 1.0% of Portland cement content per yd³ (m³).
 - 2. The water/cement ratio (w/c) of the concrete mix shall be as specified, but not exceed 0.55.
- B. Depending on the geographical location and brand of Portland cement the set time of the concrete may vary by delayed or accelerated set time. The amount of delayed or accelerated set time depends upon the concrete mix design, concrete additives, temperature of the concrete and climatic conditions. The compressive strength of the concrete mix with the waterproofing admixture may also be higher than plain concrete.

- C. Assure that trial mixes and material testing has been carried out prior to starting concrete work. Determine workability, setting times, slump, air-content and strength development. Adjust retarding, accelerating and plasticizing admixtures accordingly.
- D. Verify existing conditions before starting work.
- E. Verify that the joints are treated according to the requirements of the waterproofing manufacturer's instructions.
- C. Comply with manufacturer's product data and installation instructions.

3.2 INSTALLATION

- A. Crystalline waterproofing admixture shall be added to the concrete at the time of batching at a concrete plant or to the finished mix in the ready mix truck at the job site. The sequence of procedure for addition will vary according to the type of batch plant operation, equipment and distance from the job site.
- B. Do not add bulk (bag) dry powder crystalline waterproofing admix to wet concrete mix. This may cause clumping of the admix and uniform dispersion cannot be guaranteed. Mix with water first, before adding to wet concrete.
- B. At batching plant:
 1. Add 4 gal. (15 L) potable water per 50 lbs. (22.7 kg) powder to the wet, empty turning drum of the ready-mix truck.
 2. Add specified amount of powder crystalline waterproofing admix to turning drum and mix the powder with the water for minimum 3 minutes to a thin slurry. Assure homogenous mixing. Alternatively pre-mix the powder with water to a slurry in a plastic pail and add to the wet concrete mix in the drum of the ready-mix truck.
 3. Drive the ready-mix truck under the batch plant and add/drop the specified amount of concrete mix into the ready-mix truck. Take into account the amount of water contained in the crystalline slurry mix.
 4. Mix at least 5 minutes to assure homogenous distribution of the crystalline slurry mix within the concrete.
 5. Carry out slump and air-content quality control at job site before pouring of concrete. Prepare cylinders for concrete strength control.
- C. Ready-mix truck at job site:
 1. Mix the crystalline powder in a plastic pail with potable water to a thin slurry consistency. I.e. 50 lbs. (22.7 kg) powder to 3 gal. (12 L) water. Mix for at least 3 minutes.
 2. Add the crystalline slurry to the wet concrete mix in the turning drum of the ready-mix truck.

3. Mix at least 5 minutes to assure homogenous distribution of the crystalline slurry mix within the concrete.
 4. Carry out slump and air-content quality control at job site before pouring of concrete. Prepare cylinders for concrete strength control.
- D. Precast batch plant – pan type mixer:
1. Add the crystalline powder waterproofing to the sand and aggregate, then mix thoroughly for 3 – 5 minutes before adding the Portland cement and water.
- E. Install concrete as per project specifications, Division 03 Sections for concrete installation.

END OF SECTION

Project: (04/17)