

SECTION 071616 CRYSTALLINE WATERPROOFING

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 SECTION INCLUDES

- A. The Work of this Section includes all labor, materials, equipment, and services necessary to complete the crystalline waterproofing as shown on the drawings and/or specified herein, including, but not necessarily limited to, the following:
 - 1. Crystalline waterproofing system for interior surfaces of pits, including elevator pits.

1.3 RELATED SECTIONS

- A. Cast-in-Place Concrete - Section 033000.

1.4 SUBMITTALS

- A. Shop Drawings: Submit shop drawings showing details at terminations, at joints, at intersection of horizontal and vertical surfaces, and at penetrations in waterproofing system.
- B. Product Data: Submit manufacturer's technical information and installation instructions for all materials of this Section.
- C. Contractor's Certification: Submit per Article 1.6.
- D. Subcontractor's Qualifications: Submit per Article 1.7.

1.5 STORAGE OF MATERIALS

- A. All materials shall be stored in their original tightly sealed containers or unopened packages; shall be clearly labeled with the manufacturer's name, brand name and number, and batch number of the material where appropriate.
- B. Materials shall be stored in a neat and safe manner so as not to exceed the allowable live load of the storage area.
- C. Material shall be stored out of the weather in a clean, dry area.

1.6 MANUFACTURER'S REPRESENTATIVE

- A. Contractor shall require representative of manufacturer of the waterproofing material to provide field instructions and supervision of the installation of the complete waterproofing system.
- B. Contractor shall require the manufacturer's representative to make sure that the subcontractor's workmen are fully instructed and trained in the handling and application of all the materials, and shall see that all the materials are correctly installed.

- C. Upon completion of the installation, the Contractor shall submit to the Architect a written certification that the representative of the manufacturer of the waterproofing material has supervised the work of this Section and that all materials are correctly installed.

1.7 QUALIFICATIONS OF SUBCONTRACTORS

- A. Subcontractors: All work of this Section shall be performed by a subcontractor who is approved by the manufacturer of the waterproofing material.
- B. Qualifications of Subcontractors: Subcontractors, in order to obtain Architect's acceptance for doing work of this Section, shall submit evidence of being bona fide waterproofing subcontractors, and that they are approved by the manufacturers of the waterproofing material for the installation of their material in accordance with the requirements of this Section. Subcontractor shall submit letter from manufacturer of waterproofing material stating that the subcontractor is approved by the manufacturer for the application of the waterproofing system specified for the Project. Letter shall certify that the subcontractor has satisfactorily applied the waterproofing system specified herein under manufacturer's supervision. Letter shall be on manufacturer's letterhead and shall be signed by an officer of the company.

1.8 WARRANTY

- A. The Contractor and manufacturer shall jointly warrant the waterproofing system executed under this Section to be watertight and free from defects in materials and workmanship for a period of ten (10) year from date of acceptance of this Contract, and that he, at his own expense, repair and/or replace all other work which may be damaged as a result of such defective work, and which becomes defective during the warranty period.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Waterproofing materials shall be a cement bond compound, free from chloride and iron oxide, which waterproofs by crystalline growth through the capillary tracts and shrinkage cracks in the concrete substrate equal to "Aqua-Fin IC," as manufactured by Aqua-Fin Inc., or equal made by Tamms Industries, Xypex Chemical Corp. or Anti- Hydro Co or approved equal.
- B. Mixing Water: Potable.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where crystalline waterproofing is to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper installation of the work.

3.2 INSTALLATION

- A. Temperature Requirements: Surrounding temperatures shall be a minimum thirty-five (35) degrees F. for forty-eight (48) hours before, during and after installation.

B. Preparation of Surfaces

1. Surfaces to be waterproofed shall be clean and free of form scale, mould, laitance, oil, form release agents, curing compounds, hardeners, and any other materials likely to affect the bond penetration or performance of the waterproofing materials.
2. Materials shall not be applied to frozen or frosted surfaces, nor during rain or snow.
3. The presence of moisture in the concrete substrates is essential at the time of the waterproofing application. Should this not be the case, soak thoroughly all surfaces with water a day prior to the waterproofing, and remove all free laying water.
4. All cracks in the concrete structure exceeding 0.01" in width and construction joints which have not been treated before with crystalline waterproofing, shall be routed out to a minimum depth of 3/4".
5. Areas that have become dirty and concrete pours which have resulted in an extremely smooth surface shall be acid etched or, at the Contractor's option, may be sand blasted. Surfaces to be acid etched shall be dampened with clean water. Etching shall be done with a fifteen (15) percent hydrochloric (muriatic) acid. One gallon of acid should cover about fifty (50) to seventy-nine (79) square feet. Allow the acid to stand at least three (3) minutes and when bubbling ceases, flush off with water immediately. Do not let the acid stay on the surface for a prolonged period. When completed, the surface shall have a finish similar to fine or medium sandpaper. Surfaces which retain a smoothness or dirty condition shall be re- etched until the desired effect is obtained.
6. Fill Form: Tie holes with "Aqua-Fin Mortar" of mortar consistency.
7. Vertical Concrete Surfaces
 - a. Grind off all fins and other projections.
 - b. Extremely smooth surfaces must be etched or sand blasted.
 - c. Form ties with insets shall be removed. Chip back concrete approximately one (1) inch where form ties are without insets.
 - d. Honeycombed Pockets and Faulty Construction Joints: Rout out all faulty materials back to sound concrete; clean and rinse thoroughly with water all surfaces to be treated; check by rubbing hand over the surfaces. Hand should not become wet.

C. Mixing of Crystalline Waterproofing Materials

1. Slurry Consistency: The crystalline waterproofing materials shall be delivered in powder consistency in original undamaged containers with manufacturer's labels and seals intact.
 - a. Separate container shall be used for measuring by volume the powdery crystalline waterproofing and the water.
 - b. Measure two (2) parts of crystalline waterproofing and 0.7 - 0.9 parts of water (depending on water or absorption of concrete).
2. Mortar Consistency for Seal Strips and Coves
 - a. Add water to crystalline waterproofing and/or crystalline waterproofing reinforcing proportion 1:2 and/or 1:3 and mix thoroughly until stiff consistency is reached.
 - b. Prepare only as much mortar as can be applied within ten (10) minutes.

D. Installation of Crystalline Waterproofing Materials

1. Slurry Application

- a. Concrete surfaces to be treated with crystalline waterproofing shall be moist, not wet.
 - b. Crystalline waterproofing slurry coatings shall be applied with a stiff masonry brush or stiff broom and worked into every irregularity of the concrete surfaces.
 - c. Prior to the specified final application of crystalline waterproofing slurry coatings on the concrete surface, the following initial applications and repairs to the concrete structure have to be completed.
2. Construction Joints
- a. Construction joints shall receive a slurry coating of crystalline waterproofing 2.5 lbs. per square yard immediately prior to each concrete pour. In areas where inaccessibility is difficult, apply 2.5 lbs. per square yard of crystalline waterproofing by dry sprinkle method immediately prior to the following pour or rout out to a minimum depth of 3/4".
 - b. Apply slurry coating of crystalline waterproofing 1.5 lbs. per square yard to routed out areas of cracks and construction joints and fill remaining depth with crystalline waterproofing and crystalline waterproofing reinforcing 1:6 in mortar consistency in two (2) laminating layers after each layer has reached its initial set (approximately 20-30 minutes)
3. Installation of Crystalline Waterproofing Coves (Junction Horizontal Surfaces and Walls): Apply slurry coating of crystalline waterproofing 1.5 - 2.0 lbs. per square yard, six (6) inches in width, and install a cove with crystalline waterproofing and crystalline waterproofing reinforcing 1:3 in mortar consistency.
4. Honeycombed Pockets in Wall Areas: Rout out all faulty materials back to sound concrete. Apply slurry coating of crystalline waterproofing 1.5 lbs. per square yard over routed out area and fill with sand and cement mortar 1:3. If necessary (owing to depth) apply layers of mortar not exceeding 5/8" in thickness after each layer has hardened and repeat crystalline waterproofing slurry coating.
5. Foundation and Pit Walls - Interior Face
- a. Moisture treat vertical concrete surfaces thoroughly one day prior to application. Construction joints and form tie holes shall be filled with crystalline waterproofing and crystalline waterproofing reinforcing 1:6 in mortar consistency.
 - b. Apply two (2) slurry coatings on entire surface, consisting of "Aqua-Fin IC" crystalline waterproofing 1.25 lbs. per square yard per coating, to levels and on surfaces indicated. The second coating shall be applied while the first coating is green, normally within an hour or the application of first coating.
6. Concrete Slabs – Pits: Apply Aqua-Fin IC at the rate of 2.5 lbs./sq. yd. in slurry consistency to concrete slab surfaces in one coat.
- E. Curing of Crystalline Waterproofing Application
1. Crystalline waterproofing applications while setting shall be protected from rain, frost and from drying out. During extreme hot weather, light water fog spraying may be necessary during time of application.
 2. Moisture treat crystalline waterproofing treated areas for minimum period of three (3) days starting the day following the completion of the crystalline waterproofing application with fog water spray. Surfaces shall have moist and later wet appearance for the duration of the curing period.
 3. Treated surfaces shall not be exposed to aggressive water, chemicals or acids until the applications have reached full strength (normally after 14 days).