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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*™, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets [ ]; delete optional text in final copy of specification. Specifier Notes precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies concrete waterproofing by crystallization. These products are manufactured by ICS Penetron Intl. Ltd. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

**SECTION 03 05 01**  
**CONCRETE ADMIXTURE WATERPROOFING**

**PART 1 GENERAL**

1.01 SUMMARY

- A. Section Includes: This Section specifies integral capillary crystallization concrete waterproofing admixture for use with new concrete.

1.02 RELATED SECTIONS

Specifier Note: Include in this Article only those sections that directly affect the work of this section. Do not include Division 00 or Division 01 sections since it is assumed that all technical sections are related to all project Division 00 and Division 01 sections to some degree.

- A. Section [03 30 00 - Cast-in-Place Concrete: Concrete slabs and walls] [\_\_\_\_\_].
- B. Section [03 35 00 - Concrete Finishing] [\_\_\_\_\_].
- C. Section [03 39 00 - Concrete Curing] [\_\_\_\_\_].

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Section 01 42 19 - Reference Standards may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section. Retain only those reference standards to be used within the text of this Section. Add and delete as required for specific project.

1.03 REFERENCES

- A. ASTM International (ASTM):
  - 1. ASTM C672/C627M Standard Test Method for Scaling Resistance of Concrete Surfaces Exposed to Deicing Chemicals.
- B. New York State Department of Transportation (NY DOT):
  - 1. NY DOT Method 502-3P Freeze/Thaw Durability.
- C. National Sanitation Foundation International/American National Standards Institute (NSF/ANSI):
  - 1. NSF/ANSI 61 Drinking Water System Components - Health Effects.

- D. Army Corps of Engineers (USACE):
  - 1. USACE CRD-C48-73 Method of Test for Water Permeability of Concrete.
- E. Environmental Protection Agency (EPA).

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Section 01 33 00 - Submittal Procedures.

#### 1.04 SYSTEM DESCRIPTION

- A. Performance Requirements: Provide concrete concentrate admixture that has been manufactured and added to concrete mix at time of concrete batching to maintain performance criteria stated by manufacturer without defects, damage or failure.
  - 1. Coordinate and schedule addition of concrete admixture with concrete batching.

#### 1.05 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Section [01 33 00 - Submittal Procedures] [\_\_\_\_\_].
- B. Product Data: Submit product data, including manufacturer's SPEC-DATA product sheet, for specified products.
  - 1. Material safety data sheets (MSDS).
- C. Quality Assurance:
  - 1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties. Indicate VOCs during application [and curing].
  - 2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria and with physical requirements.
  - 3. Manufacturer's Instructions: Manufacturer's written installation instructions.

Specifier Note: Coordinate paragraph below with Part 3 Field Quality Requirements Article. Retain or delete as applicable.

- D. Manufacturer's Field Reports: Manufacturer's field reports specified.
- E. Closeout Submittals:
  - 1. Warranty: Submit warranty documents specified.
  - 2. Operation and Maintenance Data: Submit operation and maintenance data for installed products in accordance with Section [01 78 00 - Closeout Submittals] [\_\_\_\_\_].

#### 1.06 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Installer: Experienced in performing work of this section who has specialized in installation of work similar to that required for this project.
  - 2. Manufacturer: Capable of providing field service representation during construction and approving application method.

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided. Current data on building code requirements and product compliance may be obtained from manufacturer's technical support specialists.

Specifier Note: Specify regulatory requirements related to potable water and foodstuffs that ensure materials and systems are approved by the U.S. Environmental Protection Agency (EPA) or the National Sanitation Foundation International (NSF).

- B. Regulatory Requirements: In accordance with Section [01 41 00 - Regulatory Requirements] [\_\_\_\_\_]. Provide admixture that complies with requirements as follows:
  - 1. NSF/ANSI 61, Drinking Water System Components - Health Effects.
  - 2. USACE CRD-C48-73 Standard Test Method for Water Permeability of Concrete.
- C. Environmental Protection Agency (EPA).

- D. Preinstallation Meetings: Conduct preinstallation meeting to verify project requirements, manufacturer's installation instructions and manufacturer's warranty requirements. Comply with Section [01 31 19 - Project Meetings] [\_\_\_\_\_].

1.07 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Section [01 61 00 - Common Product Requirements] [\_\_\_\_\_].
- B. Ordering: Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
- C. Delivery:
  - 1. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- D. Storage and Protection:
  - 1. Store materials protected from exposure to harmful weather conditions and at temperatures recommended by the manufacturer.
  - 2. Dry store waterproofing products at [45 degrees F (7.2 degrees C)] [\_\_\_\_\_] minimum temperature.
- E. Handling: Ensure workers wear rubber gloves when handling raw materials.
- F. Waste Management and Disposal:

Specifier Note: Environment: The disposal of packaging waste into landfill sites demonstrates an inefficient use of natural resources and consumes valuable landfill space. Specifying appropriate packaging and construction waste management and disposal procedures may contribute to points required for LEED® construction project certification.

- 1. Separate waste materials for [Reuse] [And] [Recycling] [\_\_\_\_\_] in accordance with Section [01 74 19 - Construction Waste Management and Disposal] [\_\_\_\_\_].
- 2. Remove packaging materials from site and dispose of at appropriate recycling facilities.
- 3. Collect and separate for disposal [Paper] [Plastic] [Polystyrene] [Corrugated cardboard] [\_\_\_\_\_] packaging material [In appropriate onsite bins] [\_\_\_\_\_] for recycling.

1.08 PROJECT CONDITIONS

- A. Installation Location: Apply materials when substrate temperatures are above [40 degrees F (4 degrees C)] [\_\_\_\_\_].

Specifier Note: Coordinate article below with Conditions of the Contract and with Section 01 78 36 - Warranties.

1.09 WARRANTY

- A. Project Warranty: Refer to Conditions of the Contract and Section [01 78 36 - Warranties] [\_\_\_\_\_] for project warranty provisions.
- B. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.

Specifier Note: Coordinate article below with manufacturer's warranty requirements.

- C. Warranty: Commencing on Date of Shipment.

**PART 2 PRODUCTS**

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal," "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 FACILITY CRYSTALLINE WATERPROOFING

- A. Manufacturer: ICS Penetron Intl. Ltd.
  - 1. Contact: 45 Research Way, Suite 203, East Setauket, NY 11733-6401; Telephone: (631) 941-9700; Fax: (631) 941-9777; E-mail: [info@penetron.com](mailto:info@penetron.com); website: [www.penetron.com](http://www.penetron.com).
- B. Proprietary Products/Systems.
  - 1. Integral Crystalline Waterproofing Admixture: To [ASTM C672/C627M] [\_\_\_\_\_].

- a. Permeability: To [USACE CRD C48] [\_\_\_\_], maximum allowable penetration [3/64 inch (1.2 mm)] [\_\_\_\_] after [5] [\_\_\_\_] days.
  - b. Compressive Strength of Concrete With Waterproofing Admixture: in accordance with Section [03 30 00 - Cast-in-Place Concrete] [\_\_\_\_].
  - c. Freeze/Thaw: To [NY DOT Method 502-3P] [\_\_\_\_].
2. Acceptable Material: ICS Penetron Intl. Ltd. Penetron Admix.

## 2.02 MIXES

Specifier Note: Add crystalline waterproofing admixture to concrete mix at time of batching. The sequence of procedures for addition will vary according to the type of batch plant operation and equipment. Refer to PART 3 EXECUTION for further information.

- A. Mixing: Mix proprietary materials in accordance with manufacturer's instructions, product data and product technical bulletins.
  1. Batch Mix: Add proprietary admixtures to concrete mix at time of concrete batch mixing.

## 2.03 SOURCE QUALITY CONTROL

Specifier Note: Do not mix waterproofing materials from different manufacturers. Waterproofing admixtures from one manufacturer and spray applied waterproofing products from another manufacturer may not be compatible.

- A. Ensure waterproofing materials on project are from single manufacturer.

Specifier Note: Edit Paragraph below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Section 01 25 13 - Product Substitution Procedures.

## 2.04 PRODUCT SUBSTITUTIONS

- A. Substitutions: In accordance with Section [01 25 13 - Product Substitution Procedures] [No substitutions permitted].

# PART 3 EXECUTION

## 3.01 MANUFACTURER'S INSTRUCTIONS

Specifier Note: Article below is an addition to the CSI *SectionFormat* and a supplement to MANU-SPEC. Revise article below to suit project requirements and specifier's practice.

- A. Compliance: Comply with manufacturer's written data, including product technical bulletins, product catalog installation instructions, product carton installation instructions and ICS Penetron Intl. Ltd. SPEC-DATA.

## 3.02 INSTALLATION

Specifier Note: The setting time of the concrete is affected by the chemical and physical composition of ingredients, temperature of the concrete and climatic conditions. Retardation of set may occur when using crystalline waterproofing admixture. The amount of retardation will depend upon the concrete mix design and the dosage rate of the crystalline waterproofing admixture. However, under normal conditions, crystalline waterproofing admixture will provide a normal set concrete. Concrete containing crystalline waterproofing admixture may develop higher ultimate strengths than plain concrete. Trial mixes should be carried out under project conditions to determine setting time and strength of the concrete.

- A. Perform concrete work in accordance with Section [03 30 00 - Cast-in-Place Concrete] [\_\_\_\_].

## 3.03 APPLICATION PROCEDURES

- A. Add crystalline waterproofing admixture to concrete at time of batching at the dosage rate of 1% by weight of cement content. The procedure sequence for addition varies according to type of batch, plant operation and equipment.
  1. Ready-Mix Plant, Dry Batch Operation: Add crystalline waterproofing admixture in powder form to drum of ready-mix truck. Add [70] [\_\_\_\_] % of required water along with [300 - 500 lb (136 - 227 kg)] [\_\_\_\_] of aggregate. Mix materials for [3] [\_\_\_\_] minutes minimum to ensure crystalline waterproofing admixture is distributed evenly throughout mix water. Add balance of materials in accordance with standard batch practices.
  2. Ready-Mix Plant, Central Mix Operation: Mix crystalline waterproofing admixture with water to form thin slurry in ratio [15 lb (7 kg)] [\_\_\_\_] powder to [3 gal (11 L)] [\_\_\_\_] water. Pour required amount of material into drum of ready-mix truck. Pour concrete into truck and mix for [5] [\_\_\_\_] minutes minimum to ensure even distribution of crystalline

waterproofing admixture throughout concrete.

- a. Ensure aggregate, cement and water are batched and mixed in plant in accordance with standard practices and taking into account quantity of water that has already been placed in ready-mix truck.
- 3. Precast Batch Plant, Pan-Type Mixer: Add crystalline waterproofing admixture to aggregate and mix thoroughly for [3] [\_\_\_\_\_] minutes minimum prior to adding cement and water.
  - a. Ensure total concrete mass is blended using standard practices.
  - b. Obtain homogeneous mixture of crystalline waterproofing admixture with concrete.

Specifier Note: Adding dry crystalline waterproofing admixture powder directly to wet concrete will cause clumping and thorough dispersion will not occur.

- c. Do not add dry crystalline waterproofing admixture directly to wet concrete.

### 3.04 CONCRETE FINISHING

- A. Finish concrete surfaces in accordance with Section [03 35 00 - Concrete Finishing] [\_\_\_\_\_] .

### 3.05 CURING

- A. Do concrete curing in accordance with Section [03 39 00 - Concrete Curing] [\_\_\_\_\_] .

### 3.06 FIELD QUALITY CONTROL

Specifier Note: Use the following Articles when manufacturer's field services are desired to verify the quality of the installed components. Establish the number and duration of periodic site visits required by the Manufacturer and specify below. Consult with the Manufacturer for services required. Delete if field services are not required.

- A. Have manufacturer of products supplied under this Section review Work involved in handling, installation, application and protection of product[s], and submit written report in acceptable format to verify compliance of Work.
- B. Manufacturer's Field Services: Have manufacturer's technical representative schedule site visits to review work as follows:
  - 1. After delivery and storage of products.
  - 2. [[Weekly] [2 times] [\_\_\_\_\_] during progress] [at [25%] and [60%]] [\_\_\_\_\_] of completion] of work.
  - 3. Upon completion of work, after cleaning is completed.

### 3.07 PROTECTION

Specifier Note: Coordinate the following Article with Section 01 76 00 - Protecting Installed Construction.

- A. Protect installed product from damage during construction in accordance with Section [01 76 00 - Protecting Installed Construction] [\_\_\_\_\_] .

### 3.08 FINAL CLEANING

- A. Perform cleanup in accordance with Section [01 74 00 - Cleaning and Waste Management] [\_\_\_\_\_] .
- B. Upon completion, remove surplus materials, rubbish, tools and equipment.

**END OF SECTION**