

Add the following to Section 033000 – CAST-IN-PLACE CONCRETE

Article 1.1 SUMMARY, paragraph B. Related Work

Add new subparagraphs to cross reference sections for coatings and finishes applied to concrete.

B. Related Work:

- 1. Division 07 “Thermal and Moisture Protection” sections for coordination of materials adhered or applied to concrete surfaces and coordination of moisture, alkalinity and adhesion testing. Note: WVRA manufacturer will supply moisture, bonding and ph testing at no charge.**
- 2. Division 09 “Finishes” sections for coordination of materials adhered or applied to concrete surfaces and coordination of moisture, alkalinity and adhesion testing. Note: WVRA manufacturer will supply moisture, bonding and ph testing at no charge.**

Article 1.2 DEFINITIONS

Add new paragraph for definition of Water Vapor Reduction Admixture (WVRA)

- C. Water Vapor Reducing Admixtures (WVRA): Concrete admixture that reacts with the calcium hydroxide created by the Portland cement reaction with water and the free water in concrete to eliminate the route of moisture migration and eliminate the free water chemically.**

Article 1.3 PRE-INSTALLATION MEETINGS

Add new subparagraph to include WVRA Manufacturer in list of required attendees.

A. Preinstallation conference

- 1. Require representatives of**
 - a. Water Vapor Reduction Admixture (WVRA) manufacturer**

Add new subparagraphs to include WVRA requirements in discussion items included in the meeting.

- 2. Review the following:**
 - a. Special inspection and testing**
 - b. Construction joints, control joints,**
 - d. Batch, mix and delivery requirements including admixture handling.**
 - e. WVRA manufacturer’s quality control program.**
 - f. Monitoring field conditions.**

Article 1.4 ACTION SUBMITTALS

Add new subparagraphs to include WVRA Manufacturer certifications.

- D. Design Mixtures: For each concrete mixture, include the following:**

1. Mixture identification.
2. Minimum 28-day compressive strength.

- 12. Include manufacturer's certification that WRVA admixture is compatible with mix design.**
- 13. Include certification that dosage rate for WRVA admixture matches dosage rate used in performance compliance test.**

Article 1.5 INFORMATIONAL SUBMITTALS

Add new subparagraphs to include WVRA Manufacturer certification of ready mix supplier and finishers.

- A. *Qualification Data: For the following:*
1. *Installer: Include copies of applicable ACI certificates.*
 2. *Ready-mixed concrete manufacturer.*

 - 4. WRVA manufacturer's certification of Ready Mix Supplier.**
 - 5. WRVA manufacturer's certification of Concrete Finisher**

Add new subparagraph to include WVRA Manufacturer's quality control reports.

- G. *Field quality-control reports.*
- 1. Include WVRA manufacturer's testing and evaluation reports.**

Article 1.6 QUALITY ASSURANCE

Add new subparagraphs to include requirements for installer and ready mix supplier to have completed WVRA Manufacturer certification programs.

- A. *Installer Qualifications: A qualified installer who ...*
- 2. Concrete Finisher shall have completed WVRA manufacturer's certification program.**
- B. *Ready-Mixed Concrete Manufacturer Qualifications: A firm ...*
- 2. Ready-Mix Supplier shall have completed WVRA manufacturer's certification program.**

Add new paragraph for manufacturer's additional field testing in addition to other testing agencies.

- F. **WVRA manufacturer will perform additional testing. Coordinate with manufacturer's representative to allow collection of samples.**

Article 1.10 WARRANTY

Add new paragraphs for WVRA manufacturer's warranty

- A. Manufacturer's Warranty: WVRA manufacturer agrees to repair, replace, or reapply damaged floor covering or adhesive, surface treatment, coating, or paint materials that fail due to alkali efflorescence attack or moisture vapor migration through concrete within specified warranty period.**
- 1. Warranty Period: 10 years from date of Substantial Completion.**
 - 2. Failures include, but are not limited to, proven claims made on any floor covering or adhesive, surface treatment, coating, or paint that sustains damage due to alkali efflorescence attack or moisture vapor migration through concrete, and includes blistering, peeling, leakage, seepage, or absorption of moisture, petroleum, sulfides, or acids.**
 - 3. Warranty does not apply to, or cover, the following:**
 - a. Water vapor migration moving laterally under a floor covering originating from external sources such as drains or broken pipes.**
 - b. Structural cracks or damage or conditions caused by neglect, abuse, or acts of God or nature; other materials and/or conditions resulting from inferior application or workmanship or design, whether intentional or not; or situations beyond its control.**
 - c. Liquidated, incidental and/or consequential damages or for contribution or indemnity.**
- B. Project Specific Third-Party Labor and Material Insurance underwriting Manufacturer's Warranty: Liability insurance purchased by WVRA manufacturer (the first party) from a legitimate insurer (the second party) for protection against the claims of end-user and all stakeholders in Project (the third party) on a per project basis.**
- 1. Coverage Amount: Not less than 10 million U.S. dollars.**

Article 2.2 CONCRETE MATERIALS

Add new subparagraph for WVRA

- K. Chemical Admixtures: Certified by manufacturer to be ...**
- 1. Water-Reducing Admixture: ASTM C494/C494M, Type A.**
 - 2. Retarding Admixture: ASTM C494 ...**
 - 4. Water Vapor Reducing Admixture (WVRA): ASTM C494/C494M, Type S; complex catalyzed hydrous silicate, waterproofing and vaporproofing liquid admixture. Provide SPG-Specialty Products Group; Vapor Lock 20/20™.**
 - a. Properties:**
 - 1. Maximum w/cm: Maximum 0.52 without written permission and approval of mix design by WVRA manufacturer.**
 - 2. Minimum w/cm: Minimum 0.42 without written permission and approval of mix design by WVRA manufacturer.**
 - 3. Water Seepage or Permeability: Not to exceed 2.0 x 10⁻⁹ ft/s (6 x 10⁻⁸ cm/s) according to ASTM D5084.**

Article 2.7 CURING MATERIALS

Modify requirements to delete penetrating sealers which are not required where WVRA is used for impervious concrete.

Article 2.12 CONCRETE MIXING

Add new paragraph:

- C. Water Vapor Reduction Admixture (WVRA) shall be introduced into the mix with the headwater in accordance with manufacturer's dosing instructions.**
 - 1. For projects larger than 500 cubic yards, utilize dosage equipment recommended by manufacturer to monitor quantity of admixture introduced into the concrete.**

Article 3.12 APPLICATION OF LIQUID FLOOR TREATMENTS

Penetrating sealers are generally not compatible with and not required where WVRA is used for impervious concrete.

Article 3.15 FIELD QUALITY CONTROL

Add new paragraph

- D. Water Vapor Reducing Admixture (WVRA) manufacturer's testing and quality control:**
 - 1. WVRA manufacturer will obtain two cylinders for testing.**
 - 2. ASTM D-5084 Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter shall be performed.**
 - 3. On site moisture testing is conducted at no charge by SPG personnel.**
 - 4. At time of application of finish materials to concrete, on-site bond tests will be pulled by SPG personnel, at no charge, measured in Newtons. The bond test helps verify sound flooring procedures such as ambient conditions, rolling, open time and acclimatization of materials.**
 - 5. At time of application of finish materials to concrete, monitoring of ambient conditions with temperature and humidity sensors will be provided by SPG with cloud based recording and reporting of conditions. General Contractor shall provide minimum 7 days notice to WVRA manufacturer's representative of commencement of application of finishes and coatings to concrete. Sensors shall be installed a minimum of 72 hours prior to installation and be maintained for a minimum of 10 days after completion or until finishes have completely cured, whichever is greater.**

Add the following to DIVISION 7 Sections where coatings/adhesives/membranes are directly applied to CAST-IN-PLACE CONCRETE

Article 1.1 SUMMARY, paragraph B. Related Work

Add new subparagraphs to cross reference concrete.

- B. Related Work:
 - 1. **Section 033000 "Cast-In-Place Concrete" for concrete substrate requirements, compatibility of adhesives and coatings, and warranties affecting finishes provided by Water Vapor Reducing Admixture (WVRA) manufacturer.**

Article 1.4 QUALITY ASSURANCE

Include mock-up provisions that allow for pull test of the bond to the concrete. Testing will be performed by WVRA manufacturer's representative.

- A. **Mockups: Build mockups to verify selections made under Sample submittals, demonstrate aesthetic effects, set quality standards for materials and execution and permit testing of bond to concrete.**
 - 1. **Build mockups for [indicate material to be included in mock-up and] accessories.**
 - 2. **On site moisture testing is conducted at no charge by WVRA manufacturer's personnel.**
 - 3. **On site bond tests are pulled by WVRA manufacturer's personnel, at no charge, measured in Newtons. The bond test verifies sound flooring procedures such as ambient conditions, rolling, open time and acclimatization of materials.**

Article 1.6 FIELD CONDITIONS

- A. **Apply coatings when ambient temperatures will be within range recommended by manufacturer.**
 - 1. **72 hours before installation.**
 - 2. **During installation.**
 - 3. **72 hours after installation.**
- B. **WVRA manufacturer will provide monitoring of field conditions with wireless temperature and humidity sensors. Data collected will be provided to Owner, Contractor and Architect. Provide minimum 7 days notice of anticipated start of installation to allow for installation of sensors.**
- C. **WVRA manufacturer will provide moisture testing of concrete slabs to verify condition of concrete is suitable for application of adhesives and coatings.**

Article 2.1 MATERIALS

Add the following to DIVISION 9 Sections where finish coatings or adhered finishes are directly applied to CAST-IN-PLACE CONCRETE

Article 1.1 SUMMARY, paragraph B. Related Work

Add new subparagraphs to cross reference concrete.

- B. Related Work:
 - 1. **Section 033000 "Cast-In-Place Concrete" for concrete substrate requirements, compatibility of adhesives and coatings, and warranties affecting finishes provided by Water Vapor Reducing Admixture (WVRA) manufacturer.**

Article 1.4 QUALITY ASSURANCE

Include mock-up provisions that allow for pull test of the bond to the concrete. Testing will be performed by WVRA manufacturer's representative.

- A. **Mockups: Build mockups to verify selections made under Sample submittals, demonstrate aesthetic effects, set quality standards for materials and execution and permit testing of bond to concrete.**
 - 1. **Build mockups for [indicate material to be included in mock-up and] accessories.**
 - 2. **On site moisture testing is conducted at no charge by WVRA manufacturer's personnel.**
 - 3. **On site bond tests are pulled by WVRA manufacturer's personnel, at no charge, measured in Newtons. The bond test verifies sound flooring procedures such as ambient conditions, rolling, open time and acclimatization of materials.**

Article 1.6 FIELD CONDITIONS

- A. **Apply coatings when ambient temperatures will be within range recommended by manufacturer.**
 - 1. **72 hours before installation.**
 - 2. **During installation.**
 - 3. **10 days after installation or until finish materials are completely cured, whichever is greater.**
- B. **WVRA manufacturer will provide monitoring of field conditions with wireless temperature and humidity sensors. Data collected will be provided to Owner, Contractor and Architect. Provide minimum 7 days notice of anticipated start of installation to allow for installation of sensors.**
- C. **WVRA manufacturer will provide moisture testing of concrete slabs to verify condition of concrete is suitable for application of adhesives and coatings.**

Article 2.1 MATERIALS