

**SECTION 03 05 13
CONCRETE WATER VAPOR REDUCING ADMIXTURE**

PART 1 - GENERAL

1.1 CONDITIONS AND REQUIREMENTS

- A. The General Conditions, Supplementary Conditions, and Division 01 – General Requirements apply.

1.2 SECTION INCLUDES

- A. Water vapor reducing admixture (WVRA).

1.3 SUBMITTALS

- A. Submit under provisions of Section 01 30 00.
- B. Product Data: Submit for each product specified.
- C. Material Certificates: For each material specified, signed by the manufacturer, certifying that materials meet or exceed specified requirements.
- D. Material Test Reports: For each material specified, from a qualified testing agency, indicating compliance with requirements.
- E. Warranty: Submit sample special warranty specified in this section.
- F. Field quality-control reports.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm with not less than [10] years experience in manufacturing concrete water vapor reducing admixture of the type specified, capable of providing test reports indicating compliance with specified performance requirements, and able to provide on-site technical representation. Selected product must have ASTM C494 Type S Concrete Admixture approval from and independent AASHTO approved laboratory.
- B. Preinstallation Conference: Conduct conference at [project site] [Insert location] with Contractor, concrete water vapor reducing admixture manufacturer or authorized representative, concrete supplier, and concrete finisher to verify project requirements, substrate conditions, manufacturer's installation instructions, and manufacturer's warranty requirements. Concrete suppliers and finishers must be certified.
- C. Concrete Supplier Qualifications: The concrete supplier must be Certified by the WVRA manufacturer prior to bid, Certificates issued by the manufacturer must be submitted with bid documents.
- D. Concrete Finishers Qualifications: The concrete finisher must be Certified by the WVRA manufacturer prior to bid, Certificates issued by the manufacturer must be submitted with bid documents
- E. Source Limitations: Obtain each type of concrete water vapor reducing admixture from same manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials in manufacturer's original, undamaged containers with identification labels intact.
- B. Comply with manufacturer's written instructions for handling prior to adding to concrete batch.
- C. Comply with manufacturer's written instructions for storage of WVRA.

1.6 WARRANTY

- A. Manufacturer's Warranty: Manufacturer's standard form warranty document executed by an authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights the Owner may have under provisions of the Contract Documents.
 - 1. Warranty Period: [10] years from date of Substantial Completion.
 - 2. Warranty covers performance of concrete water vapor reducing admixture as well as labor and material for flooring replacement in accordance with manufacturer's current standards and applicable test results performed in accordance with ASTM D5084.
 - 3. Warranty must be augmented with a minimum \$20,000,000.00(CAD)project specific insurance policy by a legitimate third party insurance provider. End-user will be a named policy holder throughout the duration of the Warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: The concrete water vapor reducing admixture is based on Vapor Lock 20/20 manufactured by Specialty Products Group (SPG), 6254 Skyway Road, PO Box 915, Smithville ON, LOR 2A0, Canada; telephone: 877-957-4626; fax: 905-527-0606; Email: info@spggogreen.com; Web Site: <http://spggogreen.com>.
- B. Substitutions will be considered, subject to compliance with requirements of this section, under provisions of Section 01 60 00.

2.2 MATERIALS

- A. Concrete Water Vapor Reducing Admixture (WVRA): A complex admixture for cementitious materials, free of volatile organic compounds (VOC), designed to naturally chemically react with pre-existing elements within the cementitious material to eliminate the route of moisture vapor emission by integrally and permanently closing the capillary system in the concrete with the following characteristics:
 - 1. Waterproofing: Minimum 1×10^{-8} cm/s in accordance with ASTM D5084.
 - 2. Toxicity: None.
 - 3. Flammability: None.
 - 4. Solvent: Water.
 - 5. Acid Resistance: Excellent.
 - 6. Hazardous Vapors: None.
 - 7. Capillary Break: Calcium Silicate Hydrate.
 - 8. Installation: All cementitious materials.
 - 9. VOC Levels: Zero (0).

10. Inhibit mold and bacteria growth by eliminating moisture vapor emission.

2.3 RELATED MATERIALS

- A. Sheet Vapor Retarder: ASTM E1745, Class A, except with a permeance of less than 0.01 perms. Minimum thickness of material equal to 15 mils. Include manufacturer's recommended adhesive or pressure-sensitive tape.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with requirements of Section 03 30 00 for concrete mixing, placement, and curing.
- B. Sheet Vapor Retarders for Slabs on Grade: Place, protect, and repair sheet vapor retarder under provisions of ASTM E1643 and manufacturer's written instructions.
- C. Add water vapor reducing admixture to concrete in accordance with supplier's written instructions.
- D. Obtain approval of the WVRA supplier for the mix design. WVRA supplier will provide specific testing and warranty information in accordance with application requirements.
- E. Notify WVRA supplier a minimum of 10 days prior to the placement of the first batch of treated concrete.
- F. Dispense WVRA in compliance with mix design and supplier's recommendations.
- G. The use of other admixtures with WVRA in the same concrete batch is acceptable when included in the approved mix design.

3.2 CURING

- A. Curing is typically not necessary for WVRA treated slabs except in hot, cold, rainy or windy conditions. Cure finished concrete by placing 2-mil thick polyethylene plastic on top of the concrete slab. Consult with manufacturer for additional recommendations in accordance with application requirements.

3.3 FIELD QUALITY CONTROL

- A. Testing: Retain a qualified testing agency to perform tests and to submit reports.
- B. Concrete Tests:
 1. Maintain four (4) inch concrete cylinders for a minimum of one (1) year from date of Substantial Completion.
 2. Test cylinders as required by warranty or in accordance with supplier's recommendations.
 3. Test cylinders to demonstrate that the minimum waterproofing is 6×10^{-8} cm/s in accordance with ASTM D5084.
 4. Frequency: Test one (1) cylinder per project with the cost borne by the admixture supplier.
 5. Moisture Testing: The WVRA supplier will perform all field moisture testing using ASTM D 4263-83(2102) Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method-Modified for Numerical Value. Ambient conditions shall be 70 F and 50%

Relative Humidity and the moisture rise shall be no more than 0.5%. Consult with manufacturer for testing protocols.

6. Bond Testing: Warranted moisture sensitive coatings and adhesives must be installed by each subcontractor in coordination with WVRA manufacturer. Bond test results will be evaluated by WVRA manufacturer as part of the Warranty process.
7. Report test results in writing to Architect, WVRA supplier, and Contractor within 48 hours of testing. Test reports shall contain project name and number, date of WVRA application, name of testing agency, location of concrete batch in Work, concrete mix proportions and materials, and waterproofing capability.
8. Additional Tests: Testing agency shall make additional tests of concrete when test results indicate that water vapor reducing admixture capability requirements have not been met, as directed by Architect. Testing agency may conduct tests to determine adequacy of concrete by cored cylinders or by other methods as directed by Architect.
9. Additional testing, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
10. Correct deficiencies in the Work that test reports indicate do not comply with the Contract Documents.

3.4 REPAIRS

- A. Repair concrete slabs in accordance with other Division 03 sections and as recommended in manufacturer's written instructions.

END OF SECTION

SECTION 03 20 00

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Reinforcing steel for cast-in-place concrete.
- B. Supports and accessories for steel reinforcement.

1.02 RELATED SECTIONS

- A. Section 03 30 00 - Cast-in-Place Concrete.

1.03 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Comply with requirements of ACI SP-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.
 - 1. Prepare shop drawings under seal of a Professional Structural Engineer experienced in design of work of this type and licensed in Missouri.
- C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.
- D. Reports: Submit certified copies of mill test report of reinforcement materials analysis.

1.04 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301.
 - 1. Maintain one copy of document on project site.
- B. Provide Architect with access to fabrication plant to facilitate inspection of reinforcement.
- C. Welders' Certificates: Submit certifications for welders employed on the project, verifying AWS qualification within the previous 12 months.

PART 2 PRODUCTS

2.01 REINFORCEMENT

- A. Reinforcing Steel: ASTM A 615/A 615M Grade 60 (420).
 - 1. Deformed billet-steel bars.
 - 2. Unfinished.
- B. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.02 FABRICATION

- A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice, ACI SP-66 - ACI Detailing Manual, ACI 318, and ASTM A 184/A 184M.
- B. Welding of reinforcement is not permitted.

PART 3 EXECUTION

3.01 PLACEMENT

- A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

- B. Do not displace or damage vapor barrier.
- C. Accommodate placement of formed openings.
- D. Maintain concrete cover around reinforcing as indicated on the drawings
- E. Conform to applicable code for concrete cover over reinforcement.

3.02 FIELD QUALITY CONTROL

- A. An independent testing agency, as specified in Section 01 40 00, will inspect installed reinforcement for conformance to contract documents before concrete placement.

END OF SECTION 03 20 00

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Floors and slabs on grade.
- B. Concrete reinforcement.
- C. Concrete curing.

1.02 RELATED REQUIREMENTS

- A. Section 03 20 00 - Concrete Reinforcing.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements.
- C. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.
- D. Submit Warranty documents for Moisture Vapor Reduction Admixture

1.05 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
 - a. Maintain one copy of each document on site.
- B. Follow recommendations of ACI 305R when concreting during hot weather.
- C. Follow recommendations of ACI 306R when concreting during cold weather.
- D. Moisture Vapor Reduction Admixture Warranty
 - a. Manufacturer's Warranty: Submit, for the owner's acceptance, the manufacturer's standard warranty document executed by an authorized company official. The manufacturer's warranty is in addition to, and not a limitation of, other rights the Owner may have under provisions of the contract documents.
 - b. Warranty Period: Ten years commencing on the date of acceptance of the project by the Owner or Notice of Completion whichever is earliest.
 - i. Warranty Terms: Terms to include moisture related failures, including all finish floor materials and labor. Admixture warranty issued on completion of ASTM-D-5084 or ASTM-D-4263 test and results submitted to a Concure Systems Representative.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347 to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
 - 2. Earth Cuts: Do not use earth cuts as forms for vertical surfaces. Natural rock formations that maintain a stable vertical edge may be used as side forms.
 - 3. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

2.02 REINFORCEMENT

- A. Comply with requirements of Section 03 20 00.
- B. Reinforcing Steel: ASTM A 615/A 615M Grade 60
 - 1. Type: Plain; Deformed billet-steel bars.
 - 2. Finish: Unfinished.
- C. Steel Welded Wire Reinforcement: ASTM A 185/A 185M, plain type
 - 1. Form: Flat Sheets.
 - 2. Mesh Size and Wire Gage: As indicated on drawings.
- D. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16 gage.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C 150, Type I/II
 - 1. Acquire all cement for entire project from same source.
- B. Fine and Coarse Aggregates: ASTM C 33.
 - 1. Acquire all aggregates for entire project from same source.
- C. Fly Ash: ASTM C 618, Class C.
- D. Water: Clean and not detrimental to concrete.

2.04 CHEMICAL ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- B. Air Entrainment Admixture: ASTM C 260.
 - 1. Acceptable Products: Any
- C. High Range Water Reducing and Retarding Admixture: ASTM C 494/C 494M Type G.
 - 1. Acceptable Products: Any
- E. High Range Water Reducing Admixture: ASTM C 494/C 494M Type F.
 - 1. Acceptable Products: Any
- F. Water Reducing and Accelerating Admixture: ASTM C 494/C 494M Type E.
 - 1. Acceptable Products: Any
- G. Water Reducing and Retarding Admixture: ASTM C 494/C 494M Type D.
 - 1. Acceptable Products: Any
- H. Accelerating Admixture: ASTM C 494/C 494M Type C.
 - 1. Acceptable Products: Any
- I. Retarding Admixture: ASTM C 494/C 494M Type B.
 - 1. Acceptable Products: Any
- J. Water Reducing Admixture: ASTM C 494/C 494M Type A.
 - 1. Acceptable Products: Any
- K. Moisture Vapor Reduction Admixture:
 - 1. Acceptable Products: See Spec Section 03 05 13 Concrete Water Vapor Reducing Admixture.

2.05 ACCESSORY MATERIALS

- A. Underslab Vapor Retarder: Polyethylene or equivalent, complying with ASTM E 1745, Class A; stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs.
 - 1. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations in vapor retarder.
 - 2. Acceptable Products: Any
- B. Chemical Hardener: Sodium Silicate solution designed for densification of cured concrete slabs.
 - 1. Acceptable Product: L&M Seal Hard.

- C. Non-Shrink Grout: ASTM C 1107/C 1107M; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,400 psi.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 psi.
 - 3. Acceptable Products: Any
- D. Curing Materials: Submit for Approval.
- E. Moisture-Retaining Cover: ASTM C 171; regular curing paper; white curing paper; clear polyethylene; white polyethylene; or white burlap-polyethylene sheet.
- F. Liquid Curing Compound: ASTM C 309, Type 1, clear or translucent; 1.
 - 1. Acceptable Products: L&M Dress & Seal, or Dress & Seal 25 WB
- G. Crack Fill Binder
 - 1. Supplied by Moisture Vapor Reduction Admixture manufacturer.

2.06 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-dispersible acrylic latex, complying with ASTM C 1059 Type II.
 - 1. Acceptable Products: Any
- B. Epoxy Bonding System: Complying with ASTM C 881/C 881M and of Type required for specific application.
 - 1. Acceptable Products: Any
- D. Waterstops: PVC, complying with COE CRD-C 572.
 - 1. Configuration: As indicated on the drawings.
 - 2. Size: As required.
 - 3. Acceptable Products: Any
- E. Waterstops: Bentonite and butyl rubber, complying with NSF 61.
 - 1. Configuration: Only where PVC waterstop cannot be used, and only with Engineer's approval.
 - 2. Size: TBD.
 - 3. Acceptable Products: Any
- F. Joint Filler: Nonextruding, resilient asphalt impregnated fiberboard or felt; cork complying with ASTM D 1751 1/2 inch thick and full depth of slab less 1/2 inch.
 - 1. Acceptable Product: Any.
- I. Joint Filler: Compressible asphalt mastic with felt facers, complying with ASTM D 994 1/2 inch thick and full depth of slab less 1/2 inch.
 - 1. Acceptable Product: Any.

2.07 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
 - 1. Replace as much Portland cement as possible with fly ash, as is consistent with ACI recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience, as specified in ACI 301.
- B. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended by manufacturer.
 - a. Add water vapor reducing admixture per manufacturers specified dosage rate to ready mix truck at the batch plant, or jobsite before discharge, mix rapidly for 7 minutes. (Follow Manufacturer's Instructions).
 - i. To be used in lieu of designed, mix water. Not in addition to mix water. Do not alter water/cement ratio.
 - ii. w/c ratio 0.45 or less and a maximum slump of 4 inches

- E. Normal Weight Concrete:
 - 1. Compressive Strength, when tested in accordance with ASTM C 39/C 39M at 28 days: Strength as indicated on drawings.
 - 2. Fly Ash Content: Maximum 35 percent of cementitious materials by weight.
 - 3. Water-Cement Ratio: **Maximum 45 percent by weight.**

2.08 MIXING

- A. Transit Mixers: Comply with ASTM C 94/C 94M.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Formwork: Comply with requirements of ACI 301. Design and fabricate forms to support all applied loads until concrete is cured, and for easy removal without damage to concrete.
- B. Verify that forms are clean before applying release agent.
- C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.
- D. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning with steel brush and applying bonding agent in accordance with manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- E. Where new concrete with integral waterproofing is to be bonded to previously placed concrete, prepare surfaces to be treated in accordance with waterproofing manufacturer's instructions. Saturate cold joint surface with clean water, and remove excess water before application of coat of waterproofing admixture slurry. Apply slurry coat uniformly with semi-stiff bristle brush at rate recommended by waterproofing manufacturer.
- F. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.
- G. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
 - 1. Vapor Retarder Over Granular Fill: Install compactible granular fill before placing vapor retarder as shown on the drawings. Do not use sand.

3.03 INSTALLING REINFORCEMENT

- A. Fabricate and handle epoxy-coated reinforcing in accordance with ASTM D 3963/D 3963M.
- B. Comply with requirements of ACI 301. Clean reinforcement of loose rust and mill scale, and accurately position, support, and secure in place to achieve not less than minimum concrete coverage required for protection.
- C. Install welded wire reinforcement in maximum possible lengths, and offset end laps in both directions. Splice laps with tie wire.
- D. Verify that anchors, seats, plates, reinforcement and other items to be cast into concrete are accurately placed, positioned securely, and will not interfere with concrete placement.

3.04 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Place concrete for floor slabs in accordance with ACI 302.1R.
- C. Notify Engineer not less than 24 hours prior to commencement of placement operations.
- D. Ensure reinforcement; inserts; waterstops; embedded parts; and formed construction joint devices will not be disturbed during concrete placement.
- E. Repair underslab vapor retarder damaged during placement of concrete reinforcing. Repair with vapor retarder material; lap over damaged areas minimum 6 inches and seal watertight.
- F. Separate slabs on grade from vertical surfaces with joint filler unless slabs are dowelled to vertical surface.
- G. Place joint filler in floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- H. Extend joint filler from bottom of slab to within 1/2 inch of finished slab surface.
- I. Install joint devices in accordance with manufacturer's instructions.
- J. Install construction joint devices in coordination with floor slab pattern placement sequence. Set top to required elevations. Secure to resist movement by wet concrete.
- K. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- L. Place concrete continuously between predetermined expansion, control, and construction joints.
- M. Do not interrupt successive placement; do not permit cold joints to occur.
- N. Saw cut joints within 24 hours after placing. Use 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- O. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/4 inch in 10 ft.

3.05 CONCRETE FINISHING

- A. Repair surface defects immediately after removing formwork.
- B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1.4 in or more in height.
- C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
 - 2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.
 - 3. Cork Floated Finish: Immediately after form removal, apply grout with trowel or firm rubber float; compress grout with low-speed grinder, and apply final texture with cork float.
- D. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI 302.1R; thick floor coverings include quarry tile, ceramic tile, and terrazzo with full bed setting system.
 - 2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI 301.1R; thin floor coverings include carpeting, resilient flooring, seamless flooring, thin set quarry tile, and thin set ceramic tile.

3. Decorative Exposed Surfaces: "Steel trowel" as described in ACI 302.1R; use steel-reinforced plastic trowel blades instead of steel blades to avoid black-burnish marks; decorative exposed surfaces include all exposed slab surfaces.
 - a. Steel-Reinforced Plastic Trowel Blade Manufacturer: Wagman Metal Products Inc:
www.wagmanmetal.com.
- E. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains.

3.06 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- C. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 1. Normal concrete: Not less than 7 days.
 2. High early strength concrete: Not less than 4 days.
- D. Formed Surfaces: Cure by moist curing with forms in place for full curing period.
- E. Surfaces Not in Contact with Forms:
 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by liquid membrane sealing compound. Submit proposed product for approval
 3. Final Curing: Begin after initial curing but before surface is dry.
 - a. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.07 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Submit proposed mix design of each class of concrete to engineer and testing firm for review prior to commencement of concrete operations.
- D. Tests of concrete and concrete materials may be performed at any time to ensure conformance with specified requirements.
- E. Compressive Strength Tests: ASTM C 39/C 39M. For each test, mold and cure four concrete test cylinders. Obtain test samples for every 100 cu yd or less of each batch of concrete placed.
- F. Take one additional test cylinder during hot or cold weather concreting, cured on job site under same conditions as concrete it represents.
- G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C 143/C 143M.
 - a. 143/C 143M.
- H. Perform one air content test for each set of test cylinders taken, following procedures of ASTM C 685/C 685M.
- I. Perform one hydraulic conductivity test following ASTM D-5084 or ASTM D-4263 prior to placement of flooring for each each placement of concrete.
 - a. Provide results of these tests to Concure Systems for warranty purposes.
 - b. Notify Concure Systems prior to test performance and provide adequate time for representative to be present.

3.08 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Engineer and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not conforming to required lines, details, dimensions, tolerances or specified requirements.
- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

END OF SECTION 03 30 00

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