**SECTION 030510**

**CONCRETE MOISTURE VAPOR REDUCTION ADMIXTURE (MVRA)**

Revise this Section by deleting and inserting text to meet Project-specific requirements.

This Section uses the term "Architect." Change this term to match that used to identify the design professional.

The following should be noted in using this specification:

Optional text requiring a selection by the user is enclosed within brackets, e.g.: "Section [090000.] [\_\_\_\_\_.]"

Items requiring user input are enclosed within brackets, e.g.: "Section [\_\_\_\_\_ - \_\_\_\_\_\_\_\_]."

Optional paragraphs are separated by an "OR" statement, e.g.:

\*\*\*\* OR \*\*\*\*

Sustainable requirements are included for projects requiring LEED certification and are included as green text. For additional information on LEED, visit the U.S. Green Building Council website at www.usgbc.org.

1. **GENERAL**
	1. SUMMARY

Edit the following paragraph to include only those items specified in this section.

* + 1. Section Includes:
			1. Moisture Vapor Reducing Admixture (MVRA) for new concrete footings, foundations, slabs on grade, elevated slabs, roof deck, stair treads and landings, and exterior balconies.

Coordinate the following paragraphs with other sections in the project manual, as required.

* + 1. Related Sections:
			1. Division 01: Administrative, procedural, and temporary work requirements.
			2. Section [033000 - Cast-in-place Concrete:] [072600 - Vapor Retarders:] [\_\_\_\_\_\_ - \_\_\_\_:] Underslab vapor retarder.
			3. Section [090561 – Common Work Results for Flooring Preparation:] [\_\_\_\_\_\_ - \_\_\_\_:] Concrete substrate surface preparation
	1. DEFINITIONS
		1. Cementitious Materials: Portland cement alone or in combination with one or more of following:
			1. Blended hydraulic cement.
			2. Fly ash and other pozzolans.
			3. Ground granulated blast-furnace slag.
			4. Silica fume.
	2. REFERENCES
		1. American Concrete Institute (ACI) [(www.concrete.org)](http://www.concrete.org):
			1. 302.2R-06 - Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring.
			2. 305R-20 - Guide to Hot Weather Concreting.
			3. 306R-16 - Guide to Cold Weather Concreting.
			4. 308-16 - Guide to External Curing of Concrete
		2. ASTM International (ASTM) [(www.astm.com](http://www.astm.com))):
			1. C494/C494M: Standard Specification for Chemical Admixtures for Concrete.
			2. D5084 - Standard Test Methods for Measurement of Hydraulic Conductivity of Saturated Porous Materials Using a Flexible Wall Permeameter.
			3. E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill under Concrete Slabs.
			4. E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs.
			5. F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
			6. F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
			7. F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.
			8. F3311 - Standard Practice for Mat Bond Evaluation of Performance and Compatibility for Resilient Flooring System Components Prior to Installation
		3. National Ready Mix Concrete Association (NRMCA) [(www.nrmca.org](http://www.nrmca.org))) - Certification of Ready Mixed Concrete Production Facilities.
	3. SUBMITTALS

Include the following for submission of shop drawings, product data, and samples for the Architect's review.

* + 1. Submittals for Review:
			1. Product Data: Manufacturer’s descriptive data for admixture.
			2. Warranties:
				1. Sample lifetime warranty against flooring/coating failure due to concrete moisture vapor emission (MVE).
				2. Sample MVRA adhesion warranty.

Retain subparagraph below if required.

* + - * 1. Sample adhesive bond performance warranty from flooring adhesive manufacturer.

\*\*\*\* OR \*\*\*\*

* + - * 1. Sample lifetime adhesive bond performance warranty from flooring adhesive manufacturer and certified flooring installer.

Include the following for submission of quality control submittals. These submittals are intended for the Owner's record purposes and are not intended to be reviewed by the Architect.

* + 1. Quality Control Submittals:
			1. Certificate of Compliance: Manufacturer’s statement certifying admixture provided meets or exceeds specified requirements.
			2. Test Reports: Test results performed by qualified independent testing agency evidencing compliance of products with specified requirements of moisture vapor transmission based on ASTM D5084.

Include the following for submission of sustainable design submittals.

* + 1. Sustainable Design Submittals:
			1. Regional Materials.
			2. Low-Emitting Materials.
			3. Health Product Declaration (HPD).
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications:
			1. Firm experienced in manufacture of concrete MVRA.
			2. Proof of compliance with specified performance requirements.
			3. Proof of compliance with ASTM C494/C494M testing protocols, from independent AASHTO approved laboratory.
		2. Pre-Installation Conference:
			1. Convene at Project site minimum [2] [\_\_] weeks prior to beginning work of this Section.
			2. Attendance: [Architect,] [Design/Builder,] [Contractor,] [Construction Manager,] Testing Laboratory, MVRA 900 manufacturer, and concrete supplier, either in person or via teleconference.
			3. Review and discuss:
				1. Concrete mix designs.
				2. Procedures for ensuring quality of concrete materials.
				3. Procedures for ensuring conveyance of specified warranties.
		3. Ready Mixed Concrete Manufacturer Qualifications:
			1. Firm experienced in manufacturing ready-mixed concrete products.
			2. Comply with ASTM C94/C94M requirements for production facilities and equipment.
			3. Manufacturer certified according to NRMCA certification procedures.
		4. Substrate Surface Preparation and Substrate Surface Evaluation:
			1. Concrete substrate surface shall be prepared in accordance with ASTM F710 with the exception of any field moisture testing per ASTM F1869 nor ASTM F2170.
			2. Determination of whether concrete substrate is prepared to receive flooring, coatings, or roofing with respect to concrete moisture content or concrete moisture vapor emission rests with MVRA manufacturer.
			3. Mat bond evaluation shall be conducted in accordance with ASTM F3311.
		5. Obtain concrete moisture vapor reducing admixtures from same manufacturer.
		6. Slabs to Receive Moisture Sensitive Coatings or Material: Comply with ACI 302.2R-06.
	2. DELIVERY, STORAGE AND HANDLING
		1. Store products in temperature-controlled area above 40 degrees, protected from exposure to harmful weather conditions
		2. Do not allow products to freeze.
	3. WARRANTIES
		1. Provide MVRA manufacturer’s lifetime warranty against concrete induced moisture vapor failure, providing coverage for:
			1. Repair or removal of failed flooring or roofing.
			2. Placement of topical moisture remediation system.
			3. Replacement of flooring or roofing materials to match original including material and labor.
		2. Provide MVRA manufacturer’s adhesion warranty, matching terms of adhesive or primer manufacturer's material adhesion warranty.
1. **PRODUCTS**
	1. MANUFACTURERS
		1. Contract Documents are based on MVRA 900 by ISE Logik Industries, Inc. ([www.iselogik.com](http://www.iselogik.com)). Please contact **ISE Logik Industries at 877-549-5159 for all bid pricing or questions.**

Edit the following to indicate whether or not substitutions will be permitted for the products in this section.

* + 1. Substitutions: [Under provisions of Division 01.] [Not permitted.]
	1. MATERIALS
		1. MVRA 900, Concrete Moisture Vapor Reduction Admixture (MVRA), by ISE Logik Industries:
			1. Non-toxic, volatile organic compound (VOC) free, liquid admixture formulated to react with hydroxide ions produced by cement hydration process, creating additional hydration products within capillary pores, blocking moisture vapor movement through concrete.
			2. Physical characteristics:
				1. Hydraulic conductivity: Project specific maximum of 6.0 E-8 cm/s per ASTM D5084.
				2. Toxicity: None.
				3. Odor: None.
				4. Flammability: None.
				5. Volatile Organic Compound (VOC) content: 0 grams per liter.
				6. Freeze temperature: 32 degrees F (0 degrees C).
				7. pH: 11.3.
	2. ACCESSORIES

Ensure that related sections include a sheet vapor retarder complying with ASTM E1745, having maximum permeance of 0.1 US perms and minimum thickness of 0.01 inch, and including manufacturer's recommended seam adhesive or pressure-sensitive seam tape.

* + 1. Sheet Vapor Retarder: Specified in Section [033000.] [072600.]

Retain subparagraph below if required.

Ensure that related sections include adhesives and installation that convey the specified warranties.

* + 1. Flooring Adhesive: Specified in Section [090561] [096200] [096400] [096500] [096800] [\_\_\_\_\_\_]:
			1. Provide adhesive manufacturer’s warranty performance bond warranty against installation failure due to defective product providing coverage for:
				1. Equivalent floor covering
				2. Replacement adhesive manufacturer’s product
				3. Reasonable labor costs to repair or replace the failed portion of the installation

Contract Documents are based on Taylor Adhesives <https://www.tayloradhesives.com/>).

Substitutions: [Under provisions of Division 01.] [Not permitted.]

\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*OR\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\* OR \*\*\*\*

B. Flooring Adhesive: Specified in Section [090561] [096200] [096400] [096500] [096800] [\_\_\_\_\_\_]:

* + - 1. Provide adhesive manufacturer’s lifetime performance bond warranty against installation failure due to defective product providing coverage for:
				1. Equivalent floor covering
				2. Replacement adhesive manufacturer’s product
				3. Reasonable labor costs to repair or replace the failed portion of the installation
			2. Contract Documents are based on Taylor Adhesives (<https://www.tayloradhesives.com/>) utilizing a certified installer from International Certified Flooring Installers Association (CFI) (<https://cfiinstallers.org/>).
			3. Substitutions: [Under provisions of Division 01.] [Not permitted.]
	1. MIXES
		1. Moisture Vapor Reducing Admixture (MVRA) for new concrete, slabs below grade, slabs on grade, elevated slabs, roof deck, stair treads and landings, and exterior balconies.
		2. Add MVRA 900 to concrete mix in accordance with manufacturer’s instructions.

Mix designs outside of 0.40 to 0.54 w/cm may require adjustment and consultation with MVRA manufacturer prior to their use.

* + 1. Add MVRA 900 at rate of 12 ounces per 100 pounds (355ml/45kg) of total cementitious materials.
		2. Replace mix water on one-for-one basis in amount equal to amount of MVRA 900 added.
		3. Add MRVA 900 directly to freshly mixed concrete at end of the batch process with tail water.
		4. Ready-Mixed Concrete:
			1. Measure, batch, mix, and deliver concrete with MVRA 900 in accordance with ASTM C94/C94M.
			2. Furnish batch ticket information showing dosage of MVRA 900.
		5. Site Mixing:
			1. Measure, batch, and mix concrete materials and concrete in accordance with ASTM C94/C94M.
			2. Add MVRA 900 to where it makes direct contact with ready mix, then rotate drum of batch truck on high for at least seven minutes prior to discharge.
		6. Freshening onsite with held back mix water is acceptable if in accordance with ACI guidelines and if amount does not exceed original water to cementitious material ratio or instructions of [Architect.] [Design/Builder.] [Structural Engineer.]

Use of fibers is acceptable but may compromise the lifetime MVE warranty; fibers can create their own unique routes of moisture vapor emission that the MVRA cannot control if the fibers are improperly incorporated into the mix.

* + 1. Use water reducing admixtures to achieve desired slump.
		2. Use of other admixtures in same batch as MVRA 900 is acceptable if each admixture is added separately.
1. **EXECUTION**
	1. INSTALLATION
		1. Comply with requirements of Section [033000] [\_\_\_\_\_\_] for admixture dosing, concrete mixing, placing, finishing and curing.
		2. Install, protect and repair sheet vapor retarder in accordance with to ASTM E1643, ASTM F710, ACI 302.2R-06, and manufacturer's instructions.
		3. Cold Weather Placement: Comply with most current version of ACI 306R Guide to Cold Weather Concreting.
		4. Hot Weather Placement: Comply with most current version of ACI 305R Guide to Hot Weather Concreting.
	2. CURING
		1. Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306R-16 for cold-weather protection and ACI 305R-20 for hot-weather protection during curing.

Self-dissipating curing compounds may require mechanical removal prior to installation of flooring in accordance with ASTM F710. Do not chemically remove. Do not cure concrete slabs to receive moisture sensitive final finishes by ponding, misting, or other means that involves the application of water.

* + 1. Cure concrete slabs to receive moisture sensitive coatings according to ACI 308 by one or more of following methods:
			1. Evaporation Retarder
			2. Moisture-retaining curing cover.
			3. Self-dissipating curing compound.
			4. Cure and seal curing compound.
		2. Verify acceptability of curing method with MVRA manufacturer.
	1. FIELD QUALITY CONTROL
		1. Acclimatize space in accordance with ASTM F3311 prior to any manufacturer’s recommended bond testing.
		2. Test slab surface absorption (porosity) in accordance with ASTM F710 prior to any manufacturer’s recommended bond testing.
		3. Project specific quality control process as required by MVRA manufacturer necessary to convey concrete moisture vapor emission flooring failure warranty and stand-alone adhesion warranty.
		4. Project team: Upon request, provide batch tickets indicating presence and dosage of MVRA in mix.

END OF SECTION