SECTION 09 05 61

COMMON WORK RESULTS FOR FLOORING PREPARATION

PART 1 GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SECTION INCLUDES

A. This section applies to all floors identified in the contract documents to receive floor coverings, including but not limited to the following:
   1. Resinous flooring.

B. Removal of existing floor coverings.

C. Preparation of new and existing concrete floor slabs for installation of floor coverings.

D. Testing of concrete floor slabs for moisture and alkalinity (pH).

E. Provide alternate adhesive due to unsatisfactory moisture or pH conditions.
   1. Contractor shall perform all specified installations with alternate adhesive, if special adhesive is needed as indicated by test results. See Allowances and Bid Form

F. Remediation of concrete floor slabs due to unsatisfactory moisture or alkalinity (pH) conditions.
   1. Contractor shall perform all specified remediation of concrete floor slabs, if remediation is needed as indicated by test results. See Allowances and Bid Form

G. Patching compound.

1.03 RELATED REQUIREMENTS

A. Section 012100 - Allowances: Allowances created by extension of bid unit pricing for alternate adhesive and remediation treatment if required.

B. Section 01 22 00 - Unit Prices: Bid pricing for remediation treatments if required.

C. Section 01 23 00 - Alternates: Bid pricing for remediation treatments if required.

D. Section 01 40 00 - Quality Requirements: Additional requirements relating to testing agencies and testing.

E. Section 03 30 00 - Cast-in-Place Concrete: Limitations on curing requirements for new concrete floor slabs.

1.04 PRICE AND PAYMENT PROCEDURES

A. Section 004100 - Bid Proposal Form: Proposed unit prices and allowances.

B. Allowances: See Section 012100 - Allowances and Section 004100 - Bid Proposal Form. Allowances included in the Contract (Base Bid) Amount. Allowances are based on the proposed unit price multiplied by the indicated area.
   1. Include costs for moisture and pH testing by an independent agency engaged by the Contractor in the contract sum (base bid).

C. Alternates: See Section 01 23 00 - Alternates.

D. Unit Prices: See Section 01 22 00 - Unit Prices.

E. Unit Price for Alternate Flooring Adhesive: State on the bid form the unit price per square foot (square meter) for using the alternate adhesive, in the event such remediation is required.
   1. Base the unit price on the quantity indicated on the Bid Proposal Form.
   2. Indicate on the Bid Proposal Form the Allowance for Alternate Flooring Adhesive by multiplying the proposed unit price by the indicated area.
   3. Include costs for moisture and pH testing in the contract sum (base bid). Cost for moisture and pH testing is excluded from this unit price.

F. Unit Price for Moisture Mitigation Remedial Floor Coating: State on the bid form the unit price per square foot (square meter) for the floor coating, installed, in the event such remediation is required.
   1. Base the unit price on the quantity indicated on the Bid Proposal Form.
   2. Indicate on the Bid Proposal Form the Allowance for Remedial Floor Coating by multiplying the proposed unit price by the indicated area.
   3. Include costs for moisture and pH testing in the contract sum (base bid). Cost for moisture and pH testing is excluded from this unit price.

1.05 REFERENCE STANDARDS

A. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

B. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.

C. ASTM F3010 - Standard Practice for Two-Component Resin Based Membrane-Forming Moisture Mitigation Systems for Use Under Resilient Floor Coverings; 2018.

D. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring; 2021.

E. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride; 2016a.

F. ASTM F2170 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes; 2019a.

G. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; 2011.

H. International Concrete Repair Institute (ICRI) Certification program for concrete slab moisture testing.

1.06 ADMINISTRATIVE REQUIREMENTS

A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.07 SUBMITTALS

A. Visual Observation Report: For existing floor coverings to be removed.

B. Floor Covering and Adhesive Manufacturers' Product Literature: For each specific combination of substrate, floor covering, and adhesive to be used; showing:
   1. Moisture and alkalinity (pH) limits and test methods.
   2. Manufacturer's required bond/compatibility test procedure.

C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
   1. Manufacturer's qualification statement.
   2. Manufacturer's statement of compatibility with types of flooring applied over remedial product.
   3. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
   4. Manufacturer's installation instructions.
   5. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

D. Testing Agency's Report:
   1. Description of areas tested; include floor plans and photographs.
   2. Summary of conditions encountered.
   3. Moisture and alkalinity (pH) test reports.
   4. Copies of specified test methods.
   5. Include certification of accuracy by authorized official of testing agency.

6. Submit report to Architect and Owner.
7. Submit report not more than five business days after conclusion of testing.

E. Adhesive Bond and Compatibility Test Report.

1.08 QUALITY ASSURANCE

A. Moisture and alkalinity (pH) testing shall be performed by an independent testing agency employed and paid by Contractor.

B. Contractor may perform adhesive and bond test with Contractor's own personnel or hire a testing agency.

C. Testing Agency Qualifications: Independent testing agency experienced in the types of testing specified.
1. Acceptable Testing Agencies:
   a. George Donnelly Testing and Inspections; 1 Curso Lane, Hot Springs Village, Arkansas 71909; (501) 915-0626: www.moisturetesting.com.
   b. Grubbs, Hoskyn, Barton & Wyatt, Inc.; 1 Trigon Place, Little Rock, Arkansas 72209; (501) 455-2536: www.grubbsengineers.com.
   c. Other testing agent approved by Owner.
   d. Other testing agent certified as an ICRI Concrete Slab Moisture Testing Technician - Grade I.

D. Contractor's Responsibility Relating to Independent Agency Testing:
1. Provide access for and cooperate with testing agency.
2. Confirm date of start of testing at least 10 days prior to actual start.
3. Allow at least 4 business days on site for testing agency activities.
4. Achieve and maintain specified ambient conditions.
5. Notify Architect when specified ambient conditions have been achieved and when testing will start.

E. Remedial Coating Installer Qualifications: Company specializing in performing work of the type specified in this section, trained by or employed by coating manufacturer, and able to provide at least 3 project references showing at least 3 years' experience installing moisture emission coatings.

1.09 WARRANTY

A. Provide for a 20-year minimum Manufacturer's Material and Labor Warranty for Moisture Control System components, including replacement of all damaged floor covering.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, handle, and protect products in accordance with manufacturer’s instructions and recommendations.

B. Deliver materials in manufacturer’s packaging; include installation instructions.

C. Keep materials from freezing.

1.11 FIELD CONDITIONS

A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).

B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.01 MATERIALS

A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any

recommendation from flooring manufacturer, provide a product with the following characteristics:

1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
3. Compressive Strength: 4000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M.

B. Alternate Flooring Adhesive: Floor covering manufacturer's recommended product, suitable for the moisture and pH conditions present; low-VOC.

C. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of pH found, and suitable for adhesion of flooring without further treatment, installed per manufacturer's instructions including mechanical surface prep.

1. Thickness: As required for application and in accordance with manufacturer's installation instructions.
2. Acceptable Products (As recommended by manufacturer for specific project conditions):
   a. ARDEX Engineered Cements; ARDEX MC RAPID epoxy moisture control system; with ARDEX K13 or K15 self-leveling underlayment: www.ardexamericas.com.
   b. KOSTER American Corp.; either KOSTER VAP I 2000 FS, KOSTER VAP I 2000 UFS, or KOSTER VAP I 2000 ZERO VOC epoxy moisture control system; with either KOSTER LevelStrong 4500 psi, or LevelStrong HS 6500 psi self-leveling underlayment: www.kosterusa.com.
   c. MAPEI; either MAPEI Planiseal VS, or MAPEI Planiseal VS Fast epoxy moisture-reduction barrier; with MAPEI Ultraplan 1 Plus self-leveling underlayment: www.mapei.com.

PART 3 EXECUTION

3.01 CONCRETE SLAB PREPARATION

A. Prepare slab in accordance with ASTM F710.

B. Perform following operations in the order indicated:

1. Preliminary cleaning.
2. Moisture vapor emission tests; 3 tests in the first 1000 square feet (100 square meters) and one test in each additional 1000 square feet (100 square meters), unless otherwise indicated or required by flooring manufacturer.
3. Internal relative humidity tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
4. Alkalinity (pH) tests; in same locations as moisture vapor emission tests, unless otherwise indicated.
5. Specified remediation, if required.
6. Patching, smoothing, and leveling, as required.
7. Other preparation specified.
8. Adhesive bond and compatibility test.
9. Protection of substrate prior to flooring installation.

C. Remediations:

1. Active Water Leaks or Continuing Moisture Migration to Surface of Slab: Correct this condition before doing any other remediation; re-test after correction.
2. Excessive Moisture Emission or Relative Humidity: If an adhesive that is resistant to the level of moisture present is available and acceptable to flooring manufacturer, use that adhesive for installation of the flooring; if not, apply remedial floor coating or remedial sheet membrane over entire suspect floor area.

3. Excessive pH: If remedial floor coating is necessary to address excessive moisture, no additional remediation is required; if not, if an adhesive that is resistant to the level present is available and acceptable to the flooring manufacturer, use that adhesive for installation of the flooring; otherwise, apply a skim coat of specified patching compound as recommended by flooring manufacturer.

3.02 REMOVAL OF EXISTING FLOOR COVERINGS

A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.

B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.03 PRELIMINARY CLEANING

A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.

B. Do not use solvents or other chemicals for cleaning.

3.04 MOISTURE VAPOR EMISSION TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Test in accordance with ASTM F1869 and as follows.

C. Plastic sheet test and mat bond test may not be substituted for the specified ASTM test method, as those methods do not quantify the moisture content sufficiently.

D. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if test values exceed 3 pounds per 1000 square feet (1.4 kg per 93 square meters) per 24 hours.

E. Report: Report the information required by the test method.

3.05 INTERNAL RELATIVE HUMIDITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. Where this specification conflicts with the referenced test method, comply with the requirements of this section.

C. Test in accordance with ASTM F2170 Procedure A and as follows.

D. Testing with electrical impedance or resistance apparatus may not be substituted for the specified ASTM test method, as the values determined are not comparable to the ASTM test values and do not quantify the moisture content sufficiently.

E. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if any test value exceeds 75 percent relative humidity.

F. Report: Report the information required by the test method.

3.06 ALKALINITY TESTING

A. Where the floor covering manufacturer's requirements conflict with either the referenced test method or this specification, comply with the manufacturer's requirements.

B. The following procedure is the equivalent of that described in ASTM F710, repeated here for the Contractor's convenience.

1. Use a wide range alkalinity (pH) test paper, its associated chart, and distilled or deionized water.

2. Place several drops of water on a clean surface of concrete, forming a puddle approximately 1 inch (25 mm) in diameter. Allow the puddle to set for approximately 60 seconds, then dip the alkalinity (pH) test paper into the water, remove it, and compare immediately to chart to determine alkalinity (pH) reading.
3. Use of a digital pH meter with probe is acceptable; follow meter manufacturer's instructions.

C. In the event that test values exceed floor covering manufacturer's limits, perform remediation as indicated. In the absence of manufacturer limits, perform remediation if alkalinity (pH) test value is over 10.

3.07 PREPARATION

A. See individual floor covering section(s) for additional requirements.

B. Comply with requirements and recommendations of floor covering manufacturer.

C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.

D. Do not fill expansion joints, isolation joints, or other moving joints.

E. Provide finish surface tolerance meeting the requirements of the floor covering manufacturer. In the absence of manufacturer tolerance specifications ensure that the surface have no deviation exceeding 1/4 inch in 10 foot measured by the straight edge method as referenced in ACI 117 Floor Flatness Tolerances. Note: If leveling compound is required address relative humidity content and application of remedial floor coating if required prior to the installation of leveling compound.

3.08 ADHESIVE BOND AND COMPATIBILITY TESTING

A. Comply with requirements and recommendations of floor covering manufacturer.

3.09 APPLICATION OF REMEDIAL FLOOR COATING

A. Comply with requirements and recommendations of coating manufacturer.

3.10 INSTALLATION OF REMEDIAL FLOOR SHEET MEMBRANE

A. Install in accordance with sheet membrane manufacturer's instructions.

3.11 PROTECTION

A. Cover prepared floors with building paper or other durable covering.

END OF SECTION