SECTION – 09 97 26. 23
EXTERIOR CEMENTITIOUS COATING
(Meets LEED v3, EQ 4.2. & OTC & CARB/VOC 2010)

SPECIFIER NOTE
This specification is provided by Mid-Atlantic Coatings, Inc. as a service and is intended to be used as a guide-line for preparing a project specific specification section. Every heading may not be needed. Delete headings not used and renumber remaining used headings to be numerically correct. Contact Mid-Atlantic Coatings or Tnemec Company before using this specification for any product updates.

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. This Section includes shop and field surface preparation and shop and field painting of various substrates.

1. Surface preparation, including in the shop and applications of metal primer, and field applications of primers and finishes are specified in this Section.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

C. Section 04 22 00 Concrete Masonry Units

1.2 SUMMARY

A. This Section includes surface preparation and application of high-performance coating systems on the following substrates:

1. Exterior Substrates:

a. CMU Mechanical Shafts
b. CMU
c. Concrete
d. Brick
e. EIFS

B. Related Sections include the following:

1. Division 1 Section "LEED Green Building Summary, Requirements, and Goals" for additional LEED requirements.
2. Products shall meet LEED v3, EQ 4.2. & OTC & CARB/VOC requirements
3. Division 5 Sections for shop priming of metal substrates with primers specified in this Section.
4. Division 9 Section "Painting" for general field painting.

1.3 REFERENCES

A. Publications listed herein are part of this specification to extent referenced.

B. American Society for Testing and Materials:

1. ASTM B 117: Salt Spray (Fog)

2. ASTM D1653: Water Vapor Transmission of Organic Coating Films.
3. ASTM D3273: Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
5. ASTM D3359: Measuring Adhesion by Tape Test.
6. ASTM D3363: Hardness (Pencil)
7. ASTM D4141: Accelerated Outdoor Exposure Tests of Coatings.
8. ASTM D4263: Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
9. ASTM D4541: Pull-Out Strength of Coatings Using Portable Adhesion-Testers.
10. ASTM D4585: Practice for Testing the Water Resistance of Coatings Using Controlled Condensation.
11. ASTM G53 Practice for Operating Light-and-Water-Exposure Apparatus (Fluorescent UV-Condensation Type) for Exposure of Nonmetallic Materials.
12. ASTM E2178: Air Permeance Rate 01: 0.01 to 0.0002.
13. ASTM D 2370: Elongation percentage.
14. ASTM D 2246: Freeze Thaw.
15. ASTM D 4585: Humidity.
16. ASTM D 1653 Wet Method: Vapor Permence.
17. ASTM 836: Crack Bridging.
18. ASTM G 53: QUV.

C. Federal Test Standards

1. TT-C-555B: Resistance to Wind Driven Rain.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Initial Selection: For each type of finish-coat product indicated.

C. Samples for Verification: For each type of coating system and in each color and gloss of finish coat indicated.

1. Submit Samples on rigid backing, 8 inches square.
2. Step coats on Samples to show each coat required for system.
3. Label each coat of each Sample.
4. Label each Sample for location and application area.

D. Product List: For each product indicated. Cross-reference products to coating system and locations of application areas. Use same designations indicated on Drawings and in schedules.

E. LEED Submittals: For Credit EQ 4.2, manufacturers' product data for coatings, including printed statement of VOC content and chemical components.

1.3 QUALITY ASSURANCE

A. Material Performance Criteria:

1. Products: Provide certified test reports when submitting products other than those specified herein the specification. Test reports shall indicate the test method, system and requirements for those products being submitted, and shall meet or exceed the test criteria and performance values of the specified coatings herein.

B. Applicator Qualifications:

1. Preparation and Workmanship: A firm or individual with a minimum of (5) years experienced in applying coatings similar in material design, and extent to those indicated for a particular project, whose work has resulted in applications with a record of successful in-service performance.

C. Pre-Installation Meeting:

1. Schedule a conference and inspection to be held on-site before field application of coating system herein begins.

2. Conference shall be attended by Contractor, Owner's Representative, Architect, Coating Applicator, and product representative.

D. Field Samples:

1. Prepare a step down mockup of the full coating system. Apply benchmark samples of each coating system indicated to verify preliminary selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

2. Architect will select one surface to represent surfaces and conditions for application of each type of coating and substrate.

   a. Wall and Ceiling Surfaces: Provide samples of at least 100 sq. ft.
   b. Other Items: Architect will designate items or areas required.

3. Apply benchmark samples after permanent lighting and other environmental services have been activated.
4. Final approval of color selections will be based on benchmark samples.
5. If preliminary color selections are not approved, apply additional benchmark samples of additional colors selected by Architect at no added cost to Owner.
6. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Single Source Responsibility

1. Materials shall be products of a single manufacturer or items standard with manufacturer of specified coating materials.
2. Provide secondary materials which are produced or are specifically recommended by coating system manufacturer to ensure compatibility of system.

E. Regulatory Requirements:

1. Conform to applicable codes and ordinances for flame, fuel, smoke, and volatile organic compound (VOC) ratings requirements for finishes at time of application.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information.

1. Product name or title of material.
2. Product description (generic classification or binder type)
3. Manufacturer's stock number and date of manufacture.
4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.
8. VOC content.

B. Store materials not in use in tightly covered containers in well-ventilated areas with ambient temperatures continuously maintained at not less than 45 deg F.

1. Maintain containers in clean condition, free of foreign materials and residue.

2. Remove rags and waste from storage areas daily.

1.5 PROJECT CONDITIONS

A. Apply coatings only when temperature of surfaces to be coated and surrounding air temperatures are between 40 and 95 degrees F.

B. Do not apply coatings in snow, rain, fog, or mist; when relative humidity exceeds 85 percent; at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.

1.7 SEQUENCING

A. Coordination:

1. Perform work in proper sequence with work of other trades to avoid damage to finished work.
2. Where coatings are scheduled to be applied over CMU sealer, coordinate work of other trades.

1.8 PRODUCT WARRANTY

A. Provide manufacturer's (10) year crack, check, peel warranty at the completion of the project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Materials specified are those that have been evaluated for the specific service on this project. Products of the Tnemec Company, Inc. are listed to establish a standard of quality. Equivalent materials of other manufacturer's may be submitted a minimum ten days prior to bid date on written approval of the Architect.

B. Materials specified herein shall not preclude consideration of equivalent or superior materials. Requests for substitution shall be submitted to the architect a minimum ten days prior to bid date in accordance with the general construction documents and in compliance with substitution procedures in Section 01 60 00 of this Project Manual.

1. Requests for substitution shall include evidence of satisfactory past performance on substrates that are listed herein.
2. Substitutions will not be considered that change the generic type, number of coats or do not meet specified total dry film thickness.

C. Colors: As selected by Architect from manufacturer's full range.

2.2 HIGH PERFORMANCE COATINGS GENERAL

A. Materials Compatibility: Provide shop and field primers, and finish-coat materials that are single source and compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Requirements: USGBC Version LEED 3 (v3), and EQ 4.2 Low-Emitting Materials; Paints & Coatings.

1. Paints and coatings used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the following criteria. Coating Type: VOC weight in grams/liter of product minus water

   a. Non-flat: 150 g/L
   b. Sealers: 200 g/l

2.3 CONCRETE AGGREGATE & PREVIOUSLY PAINTED SURFACES SEALER

A. Tnemec Series 151-1051 Elasto-Grip

1. Generic Type: Waterborne Modified Polyamine Epoxy
2. Color: Green
3. Properties:

   a. Solids by Volume: 17.0 +/- 2%
   b. Volatile Organic Compound: 1.42 lbs/gallon (170 grams/litre)

2.4 CMU SEALER

A. Tnemec Series 130 Envirofill

1. Generic Type: Waterborne Cementitious Acrylic.
2. Colors: 130-6602: Off-White
3. Properties:

    a. Solids by Volume: 68%
    b. Volatile Organic Compound: 0.64 lbs./gallon

4. Performance Criteria

    a. Adhesion: ASTM D 3359, Method B, 5 mm Crosshatch. Not less than a rating of 5.
    b. Exterior Exposure: Exposed at 45 degrees facing south. Light industrial area. No blistering, cracking or loss of adhesion after three years exposure.
    c. Freeze Thaw: ASTM D 2246. No blistering, cracking or or loss of adhesion after 30 cycles.
    d. Humidity: ASTM D 4585. No cracking, blistering or visable loss of film integrity after 1500 hours exposure.
    e. Steam Pressure Test: Pressure Pot @ 250 Degrees F (121 degrees C) and 15 to 17 psi (1.0 to 1.2 bars). No blistering or cracking after 4 hours continuous exposure.
    f. Wind Driven Rain: TT-C-555B, 4.4.7.3. No cracking, blistering or visible damage to the substrate or coating. No visible dampness on the backside of test specimen after 24 hours exposure.

2.5 EXTERIOR MASONRY COATING (NON-FLAT, FINISH COAT)

A. Tnemec Series 156 & 157 Enviro Crete

1. Generic Type: Modified Waterborne Acrylate.
2. Finishes: Series 156 (smooth) 157 (sand texture)
3. Properties:

    a. Solids by Volume:

        i) Series 156: 50.9 +/- 2.0%
        ii) Series 157: 55.5 +/- 2.0%

    b. VOC: Unthinned

        i) Series 156: 0.41 lbs/gallon (49 grams/litre)
        ii) Series 157: 0.38 lbs/gallon (45 grams/litre)

4. Performance Criteria:

    a. Adhesion: ASTM D3359, (Method B, Crosshatch) No less than a rating of 5 out of 5 (5 being the best adhesion).
    b. Freeze/Thaw: ASTM D2246. No cracking over concrete after 20 cycles.

c. Fungal Resistance: ASTM D 3273 - 90^0F (32^0C); 95 - 98% relative humidity, suspended 3" (75 mm) above soil containing aspergillus niger, aspergillus oryzae and an unknown species of penicillium. No more than slight mold growth after five weeks exposure.
d. Humidity: ASTM D4585. No blistering, cracking or visible damage after 2,000 hours exposure.
e. Moisture Vapor Transmission: ASTM D1653 (Method B), Wet Cup, Condition C at 100 degrees F (38 degrees C):

i) Average 125 grams/meter^2 in 24 hours (smooth)
ii) Average 305 grams/meter^2 in 24 hours (textured)

f. QUV Exposure: ASTM G53 (FS-40 lamps; four hours UV/60 degrees C, four hours CON/50 degrees C). No blistering, cracking or chalking. No more than 3.0 Mac Adam units color change after 4,000 hours exposure.
g. Salt Spray (Fog): ASTM B 117. No blistering, cracking or delamination of film. No visible damage to coating or substrate after 5,000 hours.
h. Tensile Strength & Elongation: ASTM D 2370. Elongation no less than 200 percent average of five tests. Tensile strength no less than 250 psi (1.7 MPa), avearge of three tests.
i. Wind Driven Rain: TT-C-555B, Section 4.4.7.3. No damage to coating or substrate. No visible moisture on the back of lightweight block after 48 hours exposure.
j. Air Permeance Rate: ASTM E2178-01. 0.01 to 0.0002 perms @ 12-14 mils DFT.
k. Vapor Permeance: ASTM D 1653 Wet Method. 3.9 perms @ 16 mils DFT

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of work.

1. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
2. Begin coating application only after unsatisfactory conditions have been corrected and surfaces are dry.
3. Coating application indicates acceptance of surfaces and conditions.

3.2 FIELD PREPARATION

A Comply with manufacturer's written instructions and recommendations.

B. CMU: Clean & Dry. Remove all mortar splatter and point joints.

3.3 APPLICATION

A. Apply high-performance coatings according to manufacturer's written instructions.

1. Use applicators and techniques suited for coating and substrate indicated.

2. Coat surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, coat surfaces behind permanently fixed equipment or furniture with prime coat only.
3. Coat back sides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.

C. Tint each undercoat a lighter shade to facilitate identification of each coat if multiple coats of the same material are to be applied. Tint undercoats to match color of finish coat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.

D. If undercoats or other conditions show through final coat, apply additional coats until cured film has a uniform coating finish, color, and appearance.

E. Apply coatings by spray application to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Produce sharp glass lines and color breaks.

3.4 FIELD QUALITY CONTROL

A. Owner reserves the right to invoke the following procedure at any time and as often as Owner deems necessary during the period when coatings are being applied:

1. Owner will engage the services of a qualified testing agency to sample coating material being used. Samples of material delivered to Project site will be taken, identified, sealed, and certified in presence of Contractor.
2. Testing agency will perform tests for compliance with specified requirements.
3. Owner may direct Contractor to stop applying coatings if test results show materials being used do not comply with specified requirements. Contractor shall remove noncomplying coating materials from Project site, pay for testing, and recoat surfaces coated with rejected materials. Contractor will be required to remove rejected materials from previously coated surfaces if, on recoating with complying materials, the two coatings are incompatible.

3.5 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

C. Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition.

D. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

3.6 HIGH-PERFORMANCE COATING SCHEDULE

A. New Concrete Masonry Units: Lightweight and Dense Block

1. Filler Coat: Series 130-6602 Envirofill.

    a. Lightweight CMU apply at 60 to 80 square feet per gallon
    b. Dense CMU apply at 85 to 115 square feet per gallon

2. First Coat: Series 156-color Enviro-Crete

    a. Spread Rate: 98 to 196 square feet per gallon
    b. Dry Film Thickness: 4.0 to 8.0 mils

3. Second Coat: Series 156-color Enviro-Crete [1)]

    a. Spread Rate: 98 to 196 square feet per gallon
    b. Dry Film Thickness: 4.0 to 8.0 mils

4. Total Dry Film Thickness: 8.0 to 16.0 mils

B. New Concrete - Precast, Cast-In-Place, Architectural, Tilt-Up

1. First Coat: Series 156-color Enviro-Crete

    a. Spread Rate: 98 to 196 square feet per gallon
    b. Dry Film Thickness: 4.0 to 8.0 mils

2. Second Coat: Series 156-color Enviro-Crete [1)]

    a. Spread Rate: 98 to 196 square feet per gallon
    b. Dry Film Thickness: 4.0 to 8.0 mils

3. Total Dry Film Thickness: 8.0 to 16.0 mils

C. New & Previously Painted - Aggregate Filled Panels, Brick, EIFS, Concrete & CMU

1. Primer Coat: Series151-1051 Elasto-Grip

    a. Spread Rate: 250 to 400 sq ft per gallon
    b. Dry Film Thickness: 0.7 to 1.5 mils DFT

2. First Coat: Series 156-color Enviro-Crete

    a. Spread Rate: 98 to 196 square feet per gallon
    b. Dry Film Thickness: 4.0 to 8.0 mils

3. Second Coat: Series 156-color Enviro-Crete [1)]

    a. Spread Rate: 98 to 196 square feet per gallon
    b. Dry Film Thickness: 4.0 to 8.0 mils

4. Total Dry Film Thickness: 8.7 to 17.5 mils

SPEC WRITER NOTE

1) Specify Series 157 if a sand texture finish is desired and delete Series 156.

END OF SECTION 09 97 26. 23