SECTION 09 66 23.16

EPOXY-RESIN TERRAZZO FLOORING

PART 1 - GENERAL

1.01 DESCRIPTION

A. This Section describes the requirements for furnishing and installing epoxy thin-set terrazzo and flexible epoxy membrane at men's and women's toilets, historic corridors and as indicated in Outline Finish Schedule.

1.02 SUBMITTALS

A. Shop Drawings: Indicate joint and strip layouts and pattern locations, layouts, and details.

B. Color/Finish Samples:

1. Duplicate sets of 12-inch-square panels for each terrazzo system color and finish required, based upon preliminary selections determined in cooperation with the County's Representative.

2. Duplicate sets of base and other divider units, and 12-inch lengths of each type of metal strip.

C. Product Data:

1. Manufacturer's descriptive and technical data for proprietary type products.

2. Manufacturer's instructions for precautions and handling of products classified as noxious, toxic, or otherwise hazardous.

D. Maintenance Recommendations: NTMA cleaning and maintenance recommendations applicable to types of terrazzo systems required.

E. Mock-up: Construct a mock-up on a waste slab at the site, where directed by the County's Representative.

1. Make mock-up a minimum 6-feet square, full thickness. Install border and field divider strip located approximately 12-inches from one edge, and at the center of the mock-up. Mock-up shall incorporate all aggregate types and colors and each matrix color.

2. Remove unsatisfactory mock-up and construct new panels until approved.

3. Retain and protect approved mock-up until its removal is directed. The approved mock-up will be used as a standard of quality for terrazzo work on the Project.

G. LEED Submittals:

1. Credit IEQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used. Indicate VOC content in g/L calculated according to 40 CFR 59, Subpart D.

a. Furnish LEED Online Credit Template listing the adhesives and sealants used in the building and declaring that they meet the specified LEED requirements.

b. Required Audit Documentation:

1) Product data sheets and MSDS for each adhesive/sealant used on the interior, with the VOC content in g/L circled and indicating VOC content of each product used.

2) Summary table comparing credit VOC requirements and actual VOC levels for each product.

1.03 QUALITY ASSURANCE

A. Installer:

1. Regularly providing work of types required, for not less than 5-years.

2. Contracting member of NTMA, or certified to perform work in accordance with NTMA standards.

3. Furnish with initial submittals satisfactory evidence of compliance with experience requirements.

4. Approved by manufacturer of epoxy terrazzo system.

B. Materials: Suppliers shall provide materials in accordance with NTMA standards.

C. Certification: Furnish Certificates of Compliance indicating that terrazzo materials supplied for the work are in compliance with specified requirements.

1.04 ENVIRONMENTAL QUALITY ASSURANCE

A. Credit IEQ 4.1: Adhesives and sealants used on the interior of the building (defined as inside of the weatherproofing system and applied on-site) shall comply with the requirements of the following reference standards:

1. Adhesives, Sealants and Sealant Primers: Comply with South Coast Air Quality Management District (SCAQMD) Rule #1168. VOC limits as follows:

Architectural Applications	VOC Limit g/L less water	Specialty Applications	VOC Limit g/L less water
Indoor Carpet Adhesives	50	PVC welding	510
Carpet pad adhesives	50	CPVC welding	490
Wood flooring adhesives	100	ABS welding	325
Rubber floor adhesives	60	Plastic cement welding	250
Subfloor adhesives	50	Adhesive primer for plastic	550
Ceramic tile adhesives	65	Contact adhesive	80
VCT and asphalt adhesives	50	Special purpose contact adhesive	250
Drywall and panel adhesives	50	Structural wood member adhesive	140
Cove base adhesives	50	Sheet applied rubber lining operations	850
Multipurpose construction adhesives	70	Top and trim adhesive	250
Structural glazing adhesives	100		
Substrate Specific Applications	VOC Limit g/L less water	Sealants	VOC Limit g/L less water
Metal to Metal	30	Architectural	250
Plastic foams	50	Nonmembrane roof	300
Porous material (except wood)	50	Roadway	250
Wood	30	Single-ply roof membrane	450
Fiberglass	80	Other	420
Sealant Primers	VOC Limit (g/L less water)		
Architectural, nonporous	250		
Architectural, porous	775		
Other	750		

B. Applicable LEED Credits:

2. Credit IEQ 4.1 – Low-Emitting Materials - Adhesives and Sealants.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Provide factory wrapping, packaging, and other means necessary to prevent damage or deterioration of products during shipment, handling, and storage.

B. Store products inside enclosed storage facilities or closed building, supported above grade and slabs-on-grade.

C. Maintain storage spaces and products in dry condition and within temperature extremes recommended by manufacturer.

1.06 COORDINATION

A. Prior to installing terrazzo work, review details with the County's Representative, and incorporate minor adjustments determined necessary.

B. Coordination schedule for installation with installation of other finishes to minimize possibility of damage.

1.07 PROTECTION

A. Provide barriers and signs as required, and maintain until terrazzo work operations have been completed.

B. Protect surfaces adjacent to, around, or below those receiving terrazzo against damage. Repair or refinish adjacent surfaces stained, discolored, or otherwise damaged as directed.

C. Drain waste and washing water into established drainage facilities as directly as possible. Do not permit to run into planting areas or across finishes previously placed where avoidable. Where not avoidable, run off surfaces or areas shall be thoroughly washed off using adequate amounts of clean, fresh water; and brooming where necessary to remove laitance and debris.

1.08 PROJECT CONDITIONS

A. Substrate temperature shall be between 60- and 90-deg. F., and a minimum of 5-deg. F. above dew point.

B. Application shall not occur while temperature is falling to lessen off-gassing.

C. Do not apply epoxy terrazzo in direct sunshine.

PART 2 - PRODUCTS

2.01 APPROVED MANUFACTURERS

A. General Polymers or approved equal.

2.02 EPOXY TERRAZZO MATERIALS

A. Epoxy Resin:

1. Compressive Strength: 10,000-psi, ASTM D695.

2. Tensile Strength: 3,000-psi, ASTM D638.

3. Flexural Strength: 4,500-psi, ASTM D790.

4. Abrasion Resistance: 70-90 mgs lost, 1,000-cycles with CS-17 Wheel, ASTM D4060.

5. Adhesion: 350-psi, ACI 503R, 100-percent concrete failure.

6. Flammability: Self-extinguishing over concrete, ASTM D635.

7. Water Absorption: 0.1-percent, ASTM D570.

8. Chemical Resistance: Pass 7-day immersion test for acids, caustics, oil, grease, solvents, alcohols, ASTM D1308.

B. Flexible Crack-Bridging Membrane: General Polymers 3556 Epo-Flex Terrazzo Membrane or approved equal.

C. Fiberglass Scrim: General Polymers FS38-4.4 or approved equal.

D. Primer: General Polymers 3579 Low Viscosity Low Modulus Epoxy or approved equal.

E. Binder Resin: General Polymers 3520 Epoxy Terrazzo Matrix or approved equal.

F. Epoxy Filler: General Polymers 5270 or approved equal.

G. Marble Chips: Southern Aggregates; #0, #1 and #2.

1. Size shall conform to NTMA gradation standards.

2. Abrasion resistance when tested according to ASTM C131 shall not exceed 40-percent loss.

3. 24-hour absorption shall not exceed .75-percent.

4. Chips shall contain no foreign matter.

5. Dust content shall be less than 1-percent by weight.

6. Chips shall show no effect when tested according to ASTM C672 for three cycles.

H. Grout: General Polymers 3520 Epoxy Terrazzo Matrix or approved equal.

I. Epoxy Filler for Grout Coat: General Polymers 5270 or approved equal.

J Seal Coat: General Polymers 4401 Terrazzo Wet Look Sealer or 4502 Acrylic Sealer, as selected by the County's Representative or approved equal.

K. Total System Thickness: 3/8-inch.

L. Physical Properties:

1. Color: As selected by the County's Representative.

2. Hardness @ 24-hrs, Shore D, ASTM D2240: 85/65.

3. Compressive Strength, ASTM D695: 10,000-psi.

4. Tensile Strength, ASTM D638: 3,000-psi.

5. Flexural, ASTM D790: 4,500-psi.

6. Flexural Modulus, ASTM D790: 500,000-psi.

7. Adhesion, ACI 503R: 350-psi, 100-percent concrete failure.

8. Abrasion Resistance, ASTM D4060: 70-90 milligrams lost.

9. Critical Radiant Flux, ASTM D648: .90.

10. Indentation, MIL-D-3134J: None.

11. Impact Resistance, MIL-D-3134, Sec. 4.7.3: Withstands 16 ft-lbs. without cracking, delamination or chipping.

12. Resistance to Elevated Temperatures, MIL-D-3134J: No slip or flow at required temperature of 158-deg. F.

13. Slip Resistance: Meets ADA standards with sealer.

2.02 DIVIDER STRIPS

A. Approved Manufacturer: Manhattan American or approved equal.

B. Strips shall be L angle divider strips of zinc and of selected gauge.

2.03 MIXES

A. Epoxy Terrazzo:

1. Colors: To be selected by the County's Representative.

2. Proportions: Mix epoxy terrazzo in accordance with resin supplier's recommendations.

3. Mixing: Charge and mix aggregate, glass fragments, and epoxy resin in accordance with supplier's recommendations to match approved mock-ups.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that conditions are satisfactory for terrazzo work. Do not commence installation until unsatisfactory conditions have been corrected.

B. Concrete subfloor shall not vary more than 1/4-inch from true plane in 10-feet.

C. Verify that floor drains or other frame rims have been set to proper elevation and are securely fixed in place.

D. Surface Preparation for Epoxy Terrazzo:

1. Abrasive blast concrete to remove surface contaminants and laitance. Prepared concrete shall have a surface profile equal to 40-60 grit sandpaper.

2. Inspect concrete for bug holes, voids, fins, and other imperfections. Grind smooth protrusions; fill voids with filler material recommended by epoxy terrazzo manufacturer.

3.02 EPOXY TERRAZZO INSTALLATION

A. General: Apply each component in accordance with manufacturer's instructions.

B. Membrane: Mix resin and hardener in proportions recommended by epoxy terrazzo manufacturer until uniform in consistency. Pour mixed material on the substrate and apply with a v-notched red rubber squeegee at 40-mils wet film thickness. Periodically verify thickness with wet mil gauge to verify proper application thickness. Allow material to cure overnight at 75-deg. F.

C. Primer: Mix resin and hardener in proportions recommended by epoxy terrazzo manufacturer until uniform in consistency and apply with spray, roller, or brush at the rate of 250-sq. ft. per gallon to yield 5- to 8-mils wet film thickness. Allow primer to become tacky before applying mortar. If primer is not to be topped within open time, broadcast silica sand into resin tightly but uniformly and allow to cure overnight.

D. Mortar: Mix resin and hardener in proportions recommended by epoxy terrazzo manufacturer until uniform in consistency. Add aggregate blend and continue mixing until aggregates are wet out. Pour mixed material onto the substrate and hand or power trowel in place. Allow material to cure 18- to 24-hours minimum.

E. Grinding: Grind with 80 grit stones or with comparable diamond plugs.

F. Ground Coat: Mix resin and hardener in proportions recommended by epoxy terrazzo manufacturer until uniform in consistency. Hand apply at 400- to 500-sq. ft. per gallon to yield 3- to 4-mils wet film thickness using a rubber squeegee or spring-steel trowel to completely fill voids. Allow to cure 18- to 24-hours.

G. Excess Grout Removal: Sand or polish with 80 or finer grit aggregate until all grout is removed from surface. Upon completion, terrazzo shall show a minimum of 70- to 75-percent of aggregate exposure.

H. Seal Coat: Apply using 1/4-inch nap, urethane roller. Apply at a spread rate of 300- to 350-sq. ft. per gallon evenly with no puddles making sure of uniform coverage. Allow to cure 2- to 4-hours before apply a second coat. Allow 24-hours before opening to traffic.

3.03 PROTECTION

A. Protect the finished terrazzo surfaces against discoloration, defacement and other damage until final acceptance of the work.

3.04 COMPLETION

A. When complete, terrazzo color and finish shall be uniform in appearance throughout the work and shall be clean and free from stains, discoloration, and other damage and defects.

END OF SECTION