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SECTION 096723 - RESINOUS FLOORING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Decorative resinous flooring systems.
 - 2. Industrial resinous flooring systems.
 - 3. High-performance resinous flooring systems.
- B. Related Sections:
 - 1. Section 079200 "Joint Sealants" for sealants installed at joints in resinous flooring systems.
 - 2. Section 096623 "Resinous Matrix Terrazzo Flooring" for thin-set, resinous matrix terrazzo.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's technical data, application instructions, and recommendations for each resinous flooring component required.
- B. LEED Submittals:
 - 1. Product Data for Credit IEQ 4.2: For liquid-applied flooring components, documentation including printed statement of VOC content.

2. Laboratory Test Reports for Credit IEQ 4: For flooring systems, documentation indicating that products comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

- C. Samples for Initial Selection: For each type of exposed finish required.
- D. Samples for Verification: For each resinous flooring system required, **6 inches (150 mm)** square, applied to a rigid backing by Installer for this Project.
- E. Product Schedule: For resinous flooring. [~~Sds~~~Use same designations indicated on Drawings.]

1.4 INFORMATIONAL SUBMITTALS

- A. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- B. Material Certificates: For each resinous flooring component, from manufacturer.
- C. Material Test Reports: For each resinous flooring system.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For resinous flooring to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of flooring systems required for this Project.
 1. Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.
- B. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Provide secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from source recommended by manufacturer of primary materials.
- C. Mockups: Apply mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Apply full-thickness mockups on **48-inch- (1200-mm-)** square floor area selected by Architect.
 - a. Include **48-inch (1200-mm)** length of integral cove base with inside[**and outside**] corner.
 2. Simulate finished lighting conditions for Architect's review of mockups.
 3. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- D. Preinstallation Conference: Conduct conference at [**Project site**] **<Insert location>**.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring application.
- B. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring application.
- C. Close spaces to traffic during resinous flooring application and for not less than 24 hours after application unless manufacturer recommends a longer period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide HP Spartacote product named or comparable product by one of the following:
 - 1. Not all manufacturers produce all categories and types of resinous flooring systems; verify availability and revise list below to suit Project. **<Insert manufacturer's name>**.

2.2 MATERIALS

- A. VOC Content of Liquid-Applied Flooring Components: Not more than 100 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
- B. Low-Emitting Materials: Flooring system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.3 DECORATIVE RESINOUS FLOORING[<RF-#>]

- A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, decorative-aggregate-filled, epoxy-resin-based, monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].
 - 1. Basis-of-Design Product: HP Spartacote; Sparta-Chip™ Seamless Vinyl Chip Polyspartic Floor Coating System.
- B. System Characteristics:
 - 1. Color and Pattern: As selected by Architect from manufacturer's full range.
 - 2. Wearing Surface: Textured for slip resistance where required, otherwise standard manufacturer's surface as shown by sample.

3. Overall System Thickness: 20 Mils.
4. Federal Agency Approvals: [USDA] [FDA] approved for food-processing environments.

C. Body Coats:

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: 72 percent solids.
3. Type:
 - a. Initial Coat: Pigmented
 - b. Second Coat: Clear
4. Application Method: Roller or Squeegee applied with intermediate chip broadcast.
 - a. Thickness of Coats: 3 Mils.
 - b. Number of Coats: Two, with chip broadcast following second coat..
5. Aggregates: Standard HP Spartacote Vinyl Chip Flake Blends or as requested by Architect.

D. Topcoat: Sealing or finish coats.

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: 72 percent solids.
3. Type: Clear.
4. Finish: Gloss or Semi-Gloss.
5. Number of Coats: One or two as preferred indicated by sample..

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Adhesion: 400+ concrete fracture per ASTM D 4541.
2. Tensile Strength: 4500-5000 per ASTM D 638.
3. Impact Direct/Reverse: 160/160 per ASTM D 2794 Inch Pounds.
4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
5. Flammability: Self-extinguishing per ASTM D 635.
6. Hardness: 84, Shore D per ASTM D 2240.

F. System Chemical Resistance: As per manufacturer's chemical resistance chart:

1. **<Insert list of reagents that Owner has determined are likely to contact resinous flooring during in-service use>.**

2.4 DECORATIVE RESINOUS FLOORING[<RF-#>]

A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, decorative-aggregate-filled, epoxy-resin-based, monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].

1. Basis-of-Design Product: HP Spartacote; Sparta-Chip PURE™ Coating System.

B. System Characteristics:

1. Color and Pattern: As selected by Architect from manufacturer's full range.
2. Wearing Surface: Textured for slip resistance where required, otherwise standard manufacturer's surface as shown by sample.

3. Overall System Thickness: 20 Mils.
4. Federal Agency Approvals: [USDA] [FDA] approved for food-processing environments.

C. Body Coats:

1. Resin: Water-Borne Fast Cure Epoxy Polymer.
2. Formulation Description: Water-Based 50% Solids.
3. Type: Initial Coat: Pigmented.
4. Application Method: Broom applied with intermediate chip broadcast.
 - a. Thickness of Coats: 4 Mils.
 - b. Number of Coats: One with chip broadcast.
5. Aggregates: Standard HP Spartacote Vinyl Chip Flake Blends or as requested by Architect.

D. Topcoat: Sealing or finish coats.

1. Resin: Polyspartic Aliphatic Polyurea.
2. Formulation Description: Ultra high solids, no solvent.
3. Type: Clear.
4. Finish: Gloss.
5. Thickness of Coats: 8 Mils.
6. Number of Coats: One or two as preferred indicated by sample.

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Adhesion: 400+ concrete fracture per ASTM D 4541.
2. Tensile Strength: 4,500-5,000 per ASTM D 638.
3. Impact Direct/Reverse: 160/160 per ASTM D 2724 Inch Pounds.
4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
5. Flammability: Self-extinguishing per ASTM D 635.
6. Hardness: 84, Shore D per ASTM D 2240.

F. System Chemical Resistance: As per manufacturer's chemical resistance chart:

1. **<Insert list of reagents that Owner has determined are likely to contact resinous flooring during in-service use>.**

2.5 INDUSTRIAL RESINOUS FLOORING[<RF-#>]

A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, industrial-aggregate-filled, resin-based, monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].

1. Basis-of-Design Product: HP Spartacote, Sparta-Guard Solid Color Commercial and Industrial Floor Coating System.

B. System Characteristics:

1. Color and Pattern: [As selected by Architect from manufacturer's full range] [As indicated by **product designation listed above**] [Match Architect's sample] <Insert description>.
2. Wearing Surface: [Textured for slip resistance] [Smooth] [Manufacturer's standard wearing surface] <Insert description>.
3. Overall System Thickness: 9 Mils.

4. Federal Agency Approvals: [USDA] [FDA] approved for food-processing environments.

C. Body Coats:

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: 72 percent solids.
3. Application Method: Roller, broom or squeegee applied..
 - a. Thickness of Coats: 3 Mils..
 - b. Number of Coats: Two.
4. Aggregates: Fine silica sand or Sparts-Grip traction additive as needed.

D. Topcoat: Sealing or finish coats.

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: 72 percent solids.
3. Type: Clear Sparta-Flex .
4. Finish: [Matte] [Gloss].
5. Number of Coats: One.

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Adhesion: 400+ concrete fracture per ASTM D 4541.
2. Tensile Strength: 4,500-5,000 per ASTM D 638.
3. Impact Direct/Reverse: 160/160 per ASTM D 2794 Inch Pounds.
4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
5. Flammability: Self-extinguishing per ASTM D 635.
6. Hardness: 90, Shore D per ASTM D 2240.

F. System Chemical Resistance: As per manufacturer's chemical resistance chart.

1. **<Insert list of reagents that Owner has determined are likely to contact resinous flooring during in-service use>.**

2.6 INDUSTRIAL RESINOUS FLOORING[<RF-#>]

A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, industrial-aggregate-filled, resin-based, monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].

1. Basis-of-Design Product: HP Spartacote, Sparta-Guard PURE™ Solid Color Floor Coating System No Odor / No VOC.

B. System Characteristics:

1. Color and Pattern: [As selected by Architect from manufacturer's full range] [As indicated by product designation listed above] [Match Architect's sample] <Insert description>.
2. Wearing Surface: [Textured for slip resistance] [Orange-peel texture] [Smooth] [Manufacturer's standard wearing surface] <Insert description>.
3. Overall System Thickness: 12 Mils.
4. Federal Agency Approvals: [USDA] [FDA] approved for food-processing environments.

C. Body Coats:

1. Resin: Water-borne fast cure epoxy.
2. Formulation Description: 50 percent solids.
3. Application Method: Broom or Squeegee applied.
 - a. Thickness of Coats: 4 Mils.
 - b. Number of Coats: One.
4. Aggregates: Fine silica sand or Sparta-Grip traction additive as needed.

D. Topcoat: Sealing or finish coats.

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: Ultra high solids, no solvent.
3. Application Method: Broom applied.
4. Type: Clear Sparta-Flex PURE™.
5. Finish: Gloss.
6. Number of Coats: One.

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Adhesion: 400+ concrete fracture per ASTM D 4541.
2. Tensile Strength: 4,500-5,000 per ASTM D 638.
3. Impact Direct/Reverse: 160/160 per ASTM D2794 Inch Pounds.
4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
5. Flammability: Self-extinguishing per ASTM D 635.
6. Hardness: 90, Shore D per ASTM D 2240.

F. System Chemical Resistance: As per manufacturer's chemical resistance chart:

1. **<Insert list of reagents that Owner has determined are likely to contact resinous flooring during in-service use>.**

2.7 HIGH-PERFORMANCE RESINOUS FLOORING[<RF-#>]

A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, high-performance-aggregate-filled, resin-based, monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].

1. Basis-of-Design Product: HPSpartacote, Sparta-Quartz Monolithic Quartz Flooring.

B. System Characteristics:

1. Color and Pattern: [As selected by Architect from manufacturer's full range] [As indicated by **product designation listed above**] [Match Architect's sample] <Insert description>.
2. Wearing Surface: [Textured for slip resistance] [Orange-peel texture] [Smooth] [Manufacturer's standard wearing surface] <Insert description>.
3. Overall System Thickness: 25 mils.
4. Federal Agency Approvals: [USDA] [FDA] approved for food-processing environments.

C. Body Coats:

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: 72 percent solids.
3. Application Method: Roller, broom, or squeegee.

- a. Thickness of Coats: 3 Mils..
 - b. Number of Coats: Two.
4. Aggregates: **[Manufacturer's standard] [Colored quartz (ceramic-coated silica)] [Vinyl flakes] [Granite] [Natural silica] <Insert requirements>**.
- D. Topcoat: Sealing or finish coats.
1. Resin: Polyaspartic Aliphatic Polyurea.
 2. Formulation Description: 72 percent solids.
 3. Type: Clear.
 4. Finish: **[Matte] [Gloss]**.
 5. Number of Coats: Two.
- E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:
1. Adhesion: 400+ concrete fracture per ASTM D 4541
 2. Tensile Strength: 4,500-5,000 per ASTM D 638.
 3. Impact Direct/Reverse: 160/160 per ASTM D 2794 Inch Pounds.
 4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
 5. Flammability: Self-extinguishing per ASTM D 635.
 6. Hardness: 84, Shore D per ASTM D 2240.
- F. System Chemical Resistance: As per manufacturer's chemical resistance chart:
1. **<Insert list of reagents that Owner has determined are likely to contact resinous flooring during in-service use>**.
- 2.8 HIGH-PERFORMANCE RESINOUS FLOORING[<RF-#>]
- A. Resinous Flooring: Abrasion-, impact- and chemical-resistant, high-performance-aggregate-filled, resin-based, monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].
1. Basis-of-Design Product: HP Spartacote, Sparta-Quartz PURE™ Monolithic Quartz Flooring.
- B. System Characteristics:
1. Color and Pattern: **[As selected by Architect from manufacturer's full range] [As indicated by product designation listed above] [Match Architect's sample] <Insert description>**.
 2. Wearing Surface: **[Textured for slip resistance] [Orange-peel texture] [Smooth] [Manufacturer's standard wearing surface] <Insert description>**.
 3. Overall System Thickness: 25 mils.
 4. Federal Agency Approvals: **[USDA] [FDA]** approved for food-processing environments.
- C. Body Coats:
1. Resin: Water Borne Fast Cure Epoxy Primer.
 2. Formulation Description: 50 percent solids.
 3. Application Method: Broom.
 - a. Thickness of Coats: 4 Mils.
 - b. Number of Coats: One.

4. Aggregates: [**Manufacturer's standard**] [**Colored quartz (ceramic-coated silica)**] [**Vinyl flakes**] [**Granite**] [**Natural silica**] <Insert requirements>.

D. Topcoat: Sealing or finish coats.

1. Resin: Polyaspartic Aliphatic Polyurea.
2. Formulation Description: Ultra high solids, no solvent.
3. Type: Clear SpartaFlex PURE™.
4. Finish: [**Matte**] [**Gloss**].
5. Number of Coats: Two.

E. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested according to test methods indicated:

1. Adhesion: 400+ concrete fracture per ASTM D 4541.
2. Tensile Strength: 4,500-5,000 per ASTM D 638.
3. Impact Direct/Reverse: 160/160 per ASTM D 2794 Inch Pounds.
4. Abrasion Resistance: 22-28 maximum weight loss per ASTM D 4060.
5. Flammability: Self-extinguishing per ASTM D 635.
6. Hardness: 84, Shore D per ASTM D 2240.

F. System Chemical Resistance: As per manufacturer's chemical resistance chart

1. <Insert list of reagents that Owner has determined are likely to contact resinous flooring during in-service use>.

2.9 ACCESSORIES

A. Primer: Type recommended by manufacturer for substrate and body coats indicated.

1. Formulation Description: [**100 percent solids**] [**High solids**] [**Water based**] <Insert requirements>.

B. Waterproofing Membrane: Type recommended by manufacturer for substrate and primer and body coats indicated.

1. Formulation Description: [**100 percent solids**] [**High solids**] <Insert requirements>.

C. Reinforcing Membrane: Flexible resin formulation that is recommended by manufacturer for substrate and primer and body coats indicated and that prevents substrate cracks from reflecting through resinous flooring.

1. Formulation Description: [**100 percent solids**] [**High solids**] <Insert requirements>.

- a. Provide fiberglass scrim embedded in reinforcing membrane.

D. Patching and Fill Material: HP Spartacote Fast Fix™ or resinous product of or approved by resinous flooring manufacturer and recommended by manufacturer for application indicated.

PART 3 - EXECUTION

3.1 PREPARATION

- A. General: Prepare and clean substrates according to resinous flooring manufacturer's written instructions for substrate indicated. Provide clean, dry substrate for resinous flooring application.
- B. Concrete Substrates: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring.
 - 1. Roughen concrete substrates as follows:
 - a. Grind surfaces with an apparatus that abrades the concrete surface to a profile as specified by system application guide.
 - b. Comply with ASTM C 811 requirements unless manufacturer's written instructions are more stringent.
 - 2. Repair damaged and deteriorated concrete according to resinous flooring manufacturer's written instructions.
 - 3. Verify that concrete substrates are dry and moisture-vapor emissions are within acceptable levels according to manufacturer's written instructions.
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with application of resinous flooring only after substrates have maximum moisture-vapor-emission rate of **[3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m)]** <Insert emission rate> of slab area in 24 hours.
 - b. Perform plastic sheet test, ASTM D 4263. Proceed with application only after testing indicates absence of moisture in substrates.
 - c. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum **[75]** <Insert number> percent relative humidity level measurement.
 - 4. Alkalinity and Adhesion Testing: Verify that concrete substrates have pH within acceptable range. Perform tests recommended by manufacturer. Proceed with application only after substrates pass testing.
- C. Resinous Materials: Mix components and prepare materials according to resinous flooring manufacturer's written instructions.
- D. Use patching and fill material to fill holes and depressions in substrates according to manufacturer's written instructions.
- E. Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring according to manufacturer's written instructions.

3.2 APPLICATION

- A. General: Apply components of resinous flooring system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness indicated.
 - 1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.
 - 2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing processes.
 - 3. At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

- B. Apply primer over prepared substrate at manufacturer's recommended spreading rate.
- C. Apply waterproofing membrane, where indicated, in manufacturer's recommended thickness.
 - 1. Apply waterproofing membrane to integral cove base substrates.
- D. Apply reinforcing membrane to [substrate cracks] [entire substrate surface].
- E. Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring. Apply according to manufacturer's written instructions and details including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.
 - 1. Integral Cove Base: [4 inches (100 mm)] <Insert dimension> high.
- F. Apply self-leveling slurry body coats in thickness indicated for flooring system.
 - 1. Broadcast aggregates at rate recommended by manufacturer and, after resin is cured, remove excess aggregates to provide surface texture indicated.
- G. Apply body coats in thickness indicated for flooring system.
- H. Apply grout coat, of type recommended by resinous flooring manufacturer, to fill voids in surface of final body coat and to produce wearing surface indicated.
- I. Apply topcoats in number indicated for flooring system and at spreading rates recommended in writing by manufacturer.

3.3 FIELD QUALITY CONTROL

- A. Core Sampling: At the direction of Owner and at locations designated by Owner, take one core sample per 1000 sq. ft. (92.9 sq. m) of resinous flooring, or portion of, to verify thickness. For each sample that fails to comply with requirements, take two additional samples. Repair damage caused by coring and correct deficiencies.
- B. Material Sampling: Owner may at any time and any number of times during resinous flooring application require material samples for testing for compliance with requirements.
 - 1. Owner will engage an independent testing agency to take samples of materials being used. Material samples will be taken, identified, sealed, and certified in presence of Contractor.
 - 2. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures or, if not referenced, using testing procedures listed in manufacturer's product data.
 - 3. If test results show applied materials do not comply with specified requirements, pay for testing, remove noncomplying materials, prepare surfaces coated with unacceptable materials, and reapply flooring materials to comply with requirements.

3.4 PROTECTION

- A. Protect resinous flooring from damage and wear during the remainder of construction period. Use protective methods and materials, including temporary covering, recommended in writing by resinous flooring manufacturer.

END OF SECTION 096723