SECTION 096723 - RESINOUS FLOORING

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

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Resinous flooring.

Integral cove base accessories.

* + - * 1. Related Sections:

Retain subparagraphs below that contain requirements Contractor might expect to find in this Section but are specified in other Sections.

Section 071800 "Traffic Coatings" for vehicular-traffic-bearing, elastomeric flooring systems.

Section 096623 "Resinous Matrix Terrazzo Flooring" for thinset, epoxy-matrix terrazzo.

* + - 1. PREINSTALLATION MEETINGS

Retain "Preinstallation Conference" paragraph below if Work of this Section is extensive or complex enough to justify a conference.

* + - * 1. Preinstallation Conference: Conduct conference at Project site.

If needed, insert list of conference participants.

Review manufacturer's written instructions for substrate preparation and environmental conditions affecting resinous flooring installation.

Retain first subparagraph below if integral cove bases are required.

Review details of integral cove bases.

Review manufacturer's written instructions for installing resinous flooring systems.

Review protection measures for adjacent construction and installed flooring, floor drainage requirements, curbs, base details, and so forth.

* + - 1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.

Include manufacturer's technical data, installation instructions, and recommendations for each resinous flooring component required.

* + - * 1. Sustainable Design Submittals:

Insert requirements for Shop Drawings if special color patterns are required.

Retain "Samples" paragraph below for single-stage Samples, with a subordinate list if applicable. Retain "Samples for Initial Selection" and "Samples for Verification" paragraphs for two-stage Samples.

* + - * 1. Samples: For each resinous floor system required and for each color and texture specified, 6 inches square in size, applied to a rigid backing by Installer for this Project.
				2. Samples for Initial Selection: For each type of exposed finish required.
				3. Samples for Verification: For each resinous flooring system required and for each color and texture specified, 6 inches square, applied to a rigid backing by Installer for this Project.

Coordinate "Qualification Data" paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.

Retain "Material Certificates" paragraph below to require submittal of material certificates from manufacturers.

* + - * 1. Material Certificates: For each resinous flooring component.

Retain "Material Test Reports" paragraph below for material test reports that are Contractor's responsibility.

* + - * 1. Material Test Reports: For each resinous flooring system, by a qualified testing agency.
				2. Field quality-control reports.
			1. CLOSEOUT SUBMITTALS
				1. Maintenance Data: For resinous flooring to include in maintenance manuals.
			2. QUALITY ASSURANCE
				1. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

Retain subparagraph below, if required, with "Qualification Data" paragraph in "Informational Submittals" Article. See "Installer Qualifications" Article in the Evaluations.

Engage an installer who is certified in writing by resinous flooring manufacturer as qualified to apply resinous flooring systems indicated.

* + - * 1. Mockups: Build mockups to verify selections made under Sample submittals, to demonstrate aesthetic effects, and to set quality standards for materials and execution.

Retain first option in first subparagraph below if portion of floor area represented by mockup is indicated on Drawings. Consider requiring that mockups demonstrate critical edge conditions, such as intersections with other finishes and construction.

Apply full-thickness mockups on 96-inch- square floor area [**indicated on Drawings**] [**selected by Director’s Representative**].

Retain first subparagraph below for integral cove base.

Include 96-inch length of integral cove base with inside[**and outside**] corner.

Simulate finished lighting conditions for Director’s Representative's review of mockups.

Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Director’s Representative specifically approves such deviations in writing.

Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. 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.
			2. FIELD CONDITIONS
				1. Environmental Limitations: Comply with resinous flooring manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting resinous flooring installation.

Revise "Lighting" paragraph below if specific foot-candle level is required.

* + - * 1. Lighting: Provide permanent lighting or, if permanent lighting is not in place, simulate permanent lighting conditions during resinous flooring installation.
				2. Close spaces to traffic during resinous flooring installation and for 24 hours after installation unless manufacturer recommends a longer period.

If a special warranty is required, insert "Warranty" Article. Requiring a single-source warranty for installation and materials from manufacturer may ensure quality but will eliminate some manufacturers. Alternatively, a special warranty signed by the Installer and manufacturer can be required.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS
				1. Flammability: Self-extinguishing in accordance with ASTM D635.
			2. RESINOUS FLOORING <**Insert drawing designation**>

Copy this article and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Resinous Flooring System: Abrasion-, impact-, and chemical-resistant, aggregate-filled, resin-based monolithic floor surfacing designed to produce a seamless floor[**and integral cove base**].

[Manufacturers:](http://www.specagent.com/Lookup?ulid=11247) Subject to compliance with requirements, provide products by one of the following:

[Delta Polymers, Inc](http://www.specagent.com/Lookup?uid=123457174299).

[DUDICK Inc](http://www.specagent.com/Lookup?uid=123457174300).

[Key Resin Company](http://www.specagent.com/Lookup?uid=123457174306).

[Sherwin-Williams Company, General Polymers](http://www.specagent.com/Lookup?uid=123457174303).

[Sika Corporation; Flooring](http://www.specagent.com/Lookup?uid=123457174324).

[Stonhard, Inc](http://www.specagent.com/Lookup?uid=123457174317).

Approved equivalent.

* + - * 1. Source Limitations: Obtain primary resinous flooring materials, including primers, resins, hardening agents, grouting coats, and topcoats, from single source from single manufacturer. Obtain secondary materials, including patching and fill material, joint sealant, and repair materials, of type and from manufacturer recommended in writing by manufacturer of primary materials.
				2. System Characteristics:

Color and Pattern: [**As selected by Director’s Representative from manufacturer's full range**] [**As indicated by manufacturer's product designation**] [**Match Director’s Representative's sample**].

Wearing Surface: [**Textured for slip resistance**] [**Orange-peel texture**] [**Smooth**] [**Manufacturer's standard wearing surface**].

Overall System Thickness: [**1/8 inch**] [**3/16 inch**] [**1/4 inch**].

Retain "System Physical Properties" paragraph below and insert values to establish criteria for system physical properties if these characteristics are not determined by naming acceptable products. Manufacturers' testing procedures differ; revise test methods indicated and insert additional requirements to suit Project.

* + - * 1. System Physical Properties: Provide resinous flooring system with the following minimum physical property requirements when tested in accordance with test methods indicated:

Subparagraphs below are examples only and are based on test methods required in ASTM C722 and MIL-D-3134J. Revise to suit Project.

Compressive Strength: 6000 psi min, after 7 days, in accordance with ASTM C-579..

Tensile Strength: 1000 psi min in accordance with ASTM C-307; or 2000 psi min, aged 21 days, in accordance with ASTM C-190..

Flexural Modulus of Elasticity: 2,000 psi minimum in accordance with ASTM C580.

Water Absorption: 1.0 percent maximum in accordance with ASTM C413.

Shrinkage: 1.0 percent maximum in accordance with ASTM C531.

Bond Strength: 300 psi min, with 100 percent concrete failure, in accordance with ACI 403; or 500 psi min, applied to concrete and aged 21 days, in accordance with ASTM C-321.

Impact Resistance: No chipping, cracking, or delamination and not more than 1/16-inch permanent indentation in accordance with MIL-D-3134J.

Hardness: 60 minimum, Shore D in accordance with ASTM D2240.

If required by authorities having jurisdiction or Director’s Representative, insert fire-test-response-characteristic requirements to suit Project. Retain first option in "Critical Radiant Flux" subparagraph below if Class I floor finish materials are required; retain second option if Class II floor finish materials are required. See "Fire-Test-Response Characteristics" Article in the Evaluations.

Critical Radiant Flux: [**0.45 W/sq. cm**] [**0.22 W/sq. cm**] or greater in accordance with NFPA 253.

Retain "System Chemical Resistance" paragraph below to establish performance criteria if chemical resistance is not determined by naming acceptable products. If retaining, and if criteria apply only to system's topcoat, revise to suit Project.

* + - * 1. System Chemical Resistance: Test specimens of cured resinous flooring system are unaffected when tested in accordance with ASTM D543, Procedure A, for immersion in the selected reagents for no fewer than seven days.

Retain "Primer" paragraph below if primer is required. Some systems are self-priming. Some manufacturers offer alternative primers.

* + - * 1. Primer: Type recommended in writing by resinous flooring manufacturer for substrate and resinous flooring system indicated.

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

Formulation Description: [**100 percent solids**] [**High solids**] [**Water based**].

Retain "Waterproofing Membrane" paragraph below if waterproofing membrane is required. Waterproofing membranes may be self-priming, or primers may be required over waterproofing membranes.

* + - * 1. Waterproofing Membrane: Type recommended in writing by resinous flooring manufacturer for substrate and resinous flooring system indicated.

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

Formulation Description: [**100 percent solids**] [**High solids**].

Retain "Reinforcing Membrane" paragraph below if a reinforcing membrane is required for crack control. Reinforcing membranes are typically placed just over the crack area and not the entire substrate surface. Before retaining, verify availability with manufacturers. Primer may be required if reinforcing membrane is applied to entire substrate surface.

* + - * 1. Reinforcing Membrane: Flexible resin formulation that is recommended in writing by resinous flooring manufacturer for substrate and resinous flooring system indicated and that inhibits substrate cracks from reflecting through resinous flooring.

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

Formulation Description: [**100 percent solids**] [**High solids**].

Retain subparagraph below if required, or revise to suit products specified. Fiberglass-scrim reinforcement may not be required in areas subject to moderate impact; consult manufacturers for recommendations.

Provide fiberglass scrim embedded in reinforcing membrane.

* + - * 1. Patching and Fill Material: Resinous product of or approved by resinous flooring manufacturer and recommended in writing by manufacturer for installation indicated.

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

* + - * 1. Body Coats:

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

Resin: [**Epoxy**] [**Urethane**] [**Epoxy novolac**] [**Vinyl ester**] [**Methyl methacrylate**] [**Polyaspartic**].

Formulation Description: [**100 percent solids**] [**High solids**] [**Water based**].

Type: [**Clear**] [**Pigmented**].

Installation Method: [**Self-leveling slurry with broadcast aggregates**] [**Self-leveling slurry**] [**Troweled or screeded**].

Number of Coats: [**One**] [**Two**].

Thickness of Coats: [**8 mils**] [**1/16 inch**] [**1/8 inch**].

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

Retain "Grout Coat" paragraph below if required; not all systems require a grout coat.

* + - * 1. Grout Coat:

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

Resin: [**Epoxy**] [**Urethane**] [**Epoxy novolac**] [**Vinyl ester**] [**Methyl methacrylate**] [**Polyaspartic**].

Formulation Description: [**100 percent solids**] [**High solids**] [**Water based**].

Type: [**Clear**] [**Pigmented**].

Thickness of Coat: [**8 mils**] [**1/16 inch**] [**1/8 inch**].

Various topcoat options are available for resinous flooring systems. Revise "Topcoats" paragraph below to suit Project.

* + - * 1. Topcoats: Sealing or finish coats.

If required to differentiate among manufacturers' standard products, retain "Products" subparagraph below and insert specific product names or designations in subordinate list.

Resin: [**Epoxy**] [**Urethane**] [**Epoxy novolac**] [**Vinyl ester**] [**Methyl methacrylate**] [**Polyaspartic**].

Formulation Description: [**100 percent solids**] [**High solids**] [**Water based**].

Type: [**Clear**] [**Pigmented**].

Number of Coats: [**One**] [**Two**].

Thickness of Coats: [**8 mils**] [**1/16 inch**] [**1/8 inch**].

Finish: [**Matte**] [**Gloss**].

1. EXECUTION
	* + 1. EXAMINATION

Coordinate requirements specified in other Sections for substrate construction and tolerances to ensure that they are appropriate for resinous flooring installation.

* + - * 1. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resinous flooring systems.

* + - * 1. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. PREPARATION

Revise first paragraph below to suit resinous flooring systems specified.

* + - * 1. Prepare and clean substrates in accordance with resinous flooring manufacturer's written instructions for substrate indicated to ensure adhesion.

Retain "Concrete Substrates" paragraph below for concrete substrates. Insert requirements for other substrates to suit Project.

* + - * 1. 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.

Roughen concrete substrates as follows:

Retain one of first two subparagraphs below and revise to suit Project. See the Evaluations.

Shot-blast surfaces with an apparatus that abrades the concrete surface, contains the dispensed shot within the apparatus, and recirculates the shot by vacuum pickup.

Comply with requirements in SSPC-SP 13/NACE No. 6, with a Concrete Surface Profile of 3 or greater in accordance with ICRI Technical Guideline No. 310.2R, unless manufacturer's written instructions are more stringent.

Repair damaged and deteriorated concrete in accordance with resinous flooring manufacturer's written instructions.

Typically, retain "Moisture Testing" subparagraph below; excessive moisture vapor can cause resinous flooring failure. ASTM F2170 (relative humidity test) recommends one test per 1000 sq. ft., but no fewer than three tests per test area.

Moisture Testing: Perform tests so that each test area does not exceed 1000 sq. ft., and perform no fewer than three tests in each installation area and with test areas evenly spaced in installation areas.

Relative Humidity Test: Using in-situ probes, ASTM F2170. Proceed with installation only after substrates have a maximum 75 percent relative humidity level measurement.

Alkalinity and Adhesion Testing: Perform tests recommended in writing by resinous flooring manufacturer. Proceed with installation only after substrate alkalinity is not less than 6 or more than 8 pH unless otherwise recommended in writing by flooring manufacturer,

In "Patching and Filling" paragraph below, insert requirements for using patching and fill material to slope existing substrates to drains if required.

* + - * 1. Patching and Filling: Use patching and fill material to fill holes and depressions in substrates in accordance with manufacturer's written instructions.

Retain "Control Joint Treatment" subparagraph below to fill control joints and other nonmoving cracks if required.

Control Joint Treatment: Treat control joints and other nonmoving substrate cracks to prevent cracks from reflecting through resinous flooring in accordance with manufacturer's written instructions.

* + - * 1. Resinous Materials: Mix components and prepare materials in accordance with resinous flooring manufacturer's written instructions.
			1. INSTALLATION
				1. Apply components of resinous flooring system in accordance with manufacturer's written instructions to produce a uniform, monolithic wearing surface of thickness specified.

Coordinate installation of components to provide optimum adhesion of resinous flooring system to substrate, and optimum intercoat adhesion.

Cure resinous flooring components in accordance with manufacturer's written instructions. Prevent contamination during installation and curing processes.

Retain "Expansion and Isolation Joint Treatment" subparagraph below if required. Resinous flooring may require that flooring materials be placed over joints, cured, saw-cut, and then resealed; verify procedure with manufacturer. Detail joints on Drawings and revise below to suit Project.

Expansion and Isolation Joint Treatment: At substrate expansion and isolation joints, comply with resinous flooring manufacturer's written instructions.

Generally, retain "Primer" paragraph below; delete if only self-priming systems are required.

* + - * 1. Primer: Apply primer over prepared substrate at spreading rate recommended in writing by manufacturer.

Retain "Waterproofing Membrane" paragraph below if required. Waterproofing membranes may not require a primer; verify requirements for resinous flooring systems specified.

* + - * 1. Waterproofing Membrane: Apply waterproofing membrane [**where indicated on Drawings**] [**over entire substrate surface**], in thickness recommended in writing by manufacturer.

Retain subparagraph below if required.

Apply waterproofing membrane to integral cove base substrates.

Retain first option in "Reinforcing Membrane" paragraph below, if applying reinforcing membrane only to substrate cracks in areas subject to moderate impact; consult manufacturers for recommendations. Primer may not be required if reinforcing membrane covers entire substrate surface; verify requirements for resinous flooring systems specified.

* + - * 1. Reinforcing Membrane: Apply reinforcing membrane to [**substrate cracks**] [**entire substrate surface**].

Retain "Integral Cove Base Accessories" or "Field-Formed Integral Cove Base" paragraph below, or both, and indicate locations in schedules or on Drawings.

* + - * 1. Integral Cove Base Accessories: Adhesively install precast accessories before applying flooring coats and in accordance with manufacturer's written instructions.
				2. Field-Formed Integral Cove Base: Apply cove base mix to wall surfaces before applying flooring coats. Apply in accordance with manufacturer's written instructions and details, including those for taping, mixing, priming, troweling, sanding, and topcoating of cove base. Round internal and external corners.

Integral Cove Base: 4 inches high.

Retain "Self-Leveling Body Coats" paragraph below for self-leveling systems. If retaining, indicate thickness in Part 2 or insert below.

* + - * 1. Self-Leveling Body Coats: Apply self-leveling slurry body coats in thickness specified for flooring system.

Retain "Aggregates" subparagraph below for broadcast aggregates; revise to suit systems specified.

Aggregates: Broadcast aggregates at rate recommended in writing by manufacturer. After resin is cured, remove excess aggregates to provide surface texture indicated.

Retain "Troweled or Screeded Body Coats" paragraph below for troweled or screeded systems. If retaining, indicate thickness in Part 2 or insert below.

* + - * 1. Troweled or Screeded Body Coats: Apply troweled or screeded body coats in thickness specified for flooring system. Hand or power trowel and grout to fill voids. When body coats are cured, remove trowel marks and roughness using method recommended in writing by manufacturer.

Retain "Grout Coat" paragraph below if required.

* + - * 1. Grout Coat: Apply grout coat to fill voids in surface of final body coat.
				2. Topcoats: Apply topcoats in number indicated for flooring system specified, at spreading rates recommended in writing by manufacturer, and to produce wearing surface specified.
			1. FIELD QUALITY CONTROL

Retain "Material Sampling" paragraph below if size or nature of Project warrants material sampling. If retaining, revise to suit Project.

* + - * 1. Material Sampling: The Director’s Representative may, at any time and any number of times during resinous flooring installation, require material samples for testing for compliance with requirements.

The State 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.

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.

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 reinstall flooring materials to comply with requirements.

With State’s written permission, retain "Core Sampling" paragraph below to ensure compliance with thickness requirements. Core sampling requires repairing damage caused by testing.

* + - * 1. Core Sampling: At the Director’s Representative’s direction and at locations designated by the Director’s Representative, take one core sample per 1000 sq. ft. 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. Correct deficiencies in installed flooring as indicated by testing.
			1. PROTECTION
				1. 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