

SECTION 096723

RESINOUS FLOORING

PART 1 - GENERAL

1.1 GENERAL PROVISIONS

- A. Attention is directed to the CONTRACT AND GENERAL CONDITIONS and all Sections within DIVISION 01 - GENERAL REQUIREMENTS which are hereby made a part of this Section of the Specifications.

1.2 DESCRIPTION OF WORK

- A. Work Included: Provide labor, materials and equipment necessary to complete the work of this Section, including but not limited to the following:
1. Shot blasting substrate.
  2. Resinous flooring.
  3. Integral base.
  4. Aggregate matrix system.
  5. Non-slip surface and topping.
- B. Extent, without limitation, includes:
1. Indicated flooring areas with 4 inch integral base and resinous flooring for top of detainee cell concrete benches and the bench exposed edges.
  2. Performing work over long weekend due to associated odors.
- C. Related requirements includes, without limitation:
1. Section 033000 - Cast in place concrete.

1.3 SYSTEM DESCRIPTION

- A. System generally consists of:
1. Preparing substrate.
  2. Applying a cementitious urethane based seamless flooring.
  3. Quartz aggregate broadcast with urethane topcoat.
  4. Architect selected color and texture.
  5. Integral cove base where shown.
  6. Non-slip finish.

1.4 SUBMITTALS

- A. Comply with Division 01 General Requirements and submit for approval:
1. Product Data: Manufacturer's literature including installation instructions, use restrictions and limitations.
  2. Shop drawings: Layout of area to be finished showing any required expansion joints, construction joints and cove base assembly. Show all termination details and any floor drain connections.
  3. Initial Selection samples: Provide samples of color and material ranges, not less than 6 inches square and showing system thickness and all system components.
  4. Verification: Submit final samples of selected products. Include samples showing full variation of color and finish expected.
  5. Maintenance Data: Provide recommended maintenance procedures.
  6. Certification: Certify submitted materials comply with requirements.

7. Certification: Certify substrate moisture content, condition and capacity is acceptable.

- B. Field Moisture Test Reports: Submit anhydrous calcium chloride testing according to ASTM F 1869-98 and relative humidity test using in situ probes, ASTM F 2170.
- C. Mock-Up/Field Samples: Prior to installation, provide mock up of each type of system proposed for use for approval. Accepted mock-ups may be incorporated into the work unless otherwise noted.
- D. Product Test Reports: Submit manufacturer's certified independent lab test reports not more than 2 years old documenting product performance.

#### 1.5 QUALITY ASSURANCE

- A. Manufacturer experience: Not less than 10 years experience in manufacture and support of cementitious urethane, polyurethane industrial flooring.
- B. Applicator: Approved by manufacturer for surface preparation and application of specified product.
- C. Regulatory approvals and compliance required:
  - 1. United States Department of Agriculture (USDA), Food, Drug Administration (FDA), and local Health Department.
  - 2. Certified: "High Traction" by the National Floor Safety Institute (NFSI)
- D. Pre-installation conference: Held at site to review specifications, application procedure, quality control, inspection and acceptance criteria.

#### 1.6 PRODUCT REQUIREMENTS

- A. Comply with product requirements, delivery storage and handling provisions of Division 01 and the following:
  - 1. Do not deliver panels until job is ready for installation.
  - 2. Store products in ventilated dry area; protect from dampness, freezing, and direct sun light.
  - 3. Maintain temperatures below 85 °F and above 60 °F.
  - 4. Prevent breakage of containers.
  - 5. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
  - 6. Packaging: Manufacturer's packaging, clearly identified with the product type and batch number.

#### 1.7 PROJECT CONDITIONS

- A. Site Requirements
  - 1. Provide air, material and substrate temperatures between 60 F and 85 F providing substrate temperature is above its dew point. Outside of this range, consult Manufacturer in writing.
  - 2. Relative humidity: Maintain 24 hours before and after installation less than 85% and surface temperature shall be at least 5 degrees F above dew point.
  - 3. Provide lighting equal to final lighting level during the preparation and installation of system.
- B. Conditions of new concrete to be coated with cementitious urethane material.
  - 1. New concrete: Moisture cured for 7 days minimum and have fully cured for 28 days in accordance with ACI-308 prior to the application.

2. Conduct moisture tests of surfaces no sooner than 28 days after concrete installation and within 3 days of coating application.
3. Outside of these parameters consult manufacturer in writing.
4. Concrete finish: Flat rubbed finish, float or light steel trowel finish.
5. Concrete with hard steel trowel finish: Not permitted for application.
6. Sealers and curing agents shall not to be used.
7. Concrete slabs on grade without vapor barriers below: Consult manufacturer in the acceptability of using moisture suppressant coatings.

C. Safety requirements:

1. Remove open flames and spark-producing equipment from work area prior to beginning application.
2. Post "No Smoking" signs at entrances to work area.
3. Keep non-related personnel in work area to a minimum.

1.8 SEQUENCING & SCHEDULING

- A. Ensure new and existing concrete surfaces are clean and properly prepared in time for surfaces to be sufficiently dry and cured for proper application for flooring.
- B. See article called "Extent" above in para. 1.2.B.

PART 2 - PRODUCTS

2.1 BASIS OF DESIGN / MANUFACTURER

- A. Acceptable manufacturers and fabricators, subject to compliance with specifications, include:
  1. Dur-A-Flex, Inc., <http://www.dur-a-flex.com/>.
  2. The Stonehard Group; <https://www.stonhard.com/>.
  3. Key Resin Company; <http://www.keyresin.com/>.
- B. Basis of design: Dur-A-Flex Poly-Crete MDB (self leveling broadcast quartz), Urethane topcoat seamless flooring system using components as follows:
  1. Topping: Poly-Crete MD resin, hardener and aggregate.
  2. Aggregate Flintshot quartz aggregate.
  3. Topcoat: Poly-Crete CF resin, hardener and powder aggregate.
  4. Shallow Fill and Patching: Poly-Crete MD (up to ¼ inch).
- C. Moisture mitigation: Where moisture of system does not meet criteria, and subject to express, written approval of system manufacturer, provide manufacturer' recommended system such as Dur-A-Glazed MVP Primer.

2.2 PERFORMANCE REQUIREMENTS

- A. Meet or exceed the following:

CRITERIA	TEST	RESULT
<b>Topping [ Poly-Crete MD]</b>		
Percent Reactive	Percent Reactive	100%
VOC	VOC	0 g/L
Bond Strength to Concrete	ASTM D 4541	400 psi, substrates fails
Compressive Strength	ASTM C 579	7,400 psi
Tensile Strength	ASTM D 638	1,800 psi
Impact Resistance @ 125 mils	MIL D-3134	>160 inch lbs No vis. damage/deterioration

**Topcoat [ Poly-Crete CF]**

Percent Solids		100%
VOC		0 g/L
Compressive Strength	ASTM C 579	7,800 psi
Tensile Strength	ASTM D 638	4,200 psi
Flexural Strength	ASTM D 790	1,000 psi
Abrasion Resistance	ASTM D 4060	10 mg loss CS-17 wheel, 1,000gm
Impact Resistance	ASTM D 1709	160 in.lbs
Shore D Hardness,	ASTM D 2240	65
Gloss	ASTM D 523	40-50 Satin Appearance

- B. Non-slip performance: When wet system shall meet or exceed: A tested coefficient of friction when wet of 0.60 or higher. When dry, system shall meet European coefficient of friction of R12 or better.

**2.3 COLORS & TEXTURES**

- A. Colors and textures shall be as selected by Architect from available options.

**PART 3 - EXECUTION**

**3.1 GENERAL**

- A. Comply with the provisions of Division 01 - including requirements related to:
1. Inspection. Tolerances and measurement.
  2. Approvals, inspections and filed quality control.
  3. Layout. Adjusting.
  4. Cleaning. Protection.

**3.2 EXAMINATION**

- A. Examine and verify conditions per Division 01 and as follows:
1. Verify substrates and underlying work is within tolerances specified.
  2. Verify structural components are properly placed.
  3. Before installation, examine rough-in and built-in construction for mechanical/electrical and other systems to verify actual locations of connections.
  4. Proceed with installation only after unsatisfactory conditions have been corrected.

**3.3 PREPARATION**

- A. New and existing concrete surfaces shall be free of oil, grease, curing compounds, loose particles, moss, algae growth, laitance, friable matter, dirt, and bituminous products.
- B. Moisture Testing: Perform tests recommended by manufacturer and as follows.
1. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 95% relative humidity level measurement.
  2. If the relative humidity exceeds 95% then the Owner and/or Engineer shall be notified and advised of additional cost for the possible installation of a vapor mitigation system that has been approved by the manufacturer or other means to lower the value to the acceptable limit.

- C. There shall be no visible moisture present on the surface at the time of application of the system. Compressed oil-free air and/or a light passing of a propane torch may be used to dry the substrate.
- D. Mask and protect areas, surfaces and openings not part of this work from adverse affections of preparation and installation
- E. Mechanical surface preparation Shot blast all surfaces to receive flooring system with a mobile steel shot, dust recycling machine (Blastrac or equal). All surface and embedded accumulations of paint, toppings hardened concrete layers, laitance, power trowel finishes and other similar surface characteristics shall be completely removed leaving a bare concrete surface having a minimum profile of CSP 4-5 as described by the International Concrete Repair Institute.
  - 1. Floor areas inaccessible to the mobile blast machines shall be mechanically abraded to the same degree of cleanliness, soundness and profile using diamond grinders, needle guns, bush hammers, or other suitable equipment.
  - 2. Wherever a free edge will occur, including doorways, wall perimeters, expansion joints, columns, doorways, drains and equipment pads, a 1/4 inch deep by 3/16 inch wide keyways shall be cut in.
  - 3. Cracks and joints (non-moving) greater than 1/4 inch wide are to be chiseled or chipped-out and repaired per manufacturer's recommendations.
  - 4. At spalled or worn areas, mechanically remove loose or delaminated concrete to a sound concrete and patch per manufactures recommendations.

### 3.4 APPLICATION

- A. General: Apply system in 3 distinct steps as follows:
  - a. Substrate preparation
  - b. Topping/overlay application with quartz aggregate broadcast.
  - c. Topcoat application, with an anti-slip aggregate broadcast.
- B. Application start-up:
  - 1. Immediately prior to application of system components, dry surfaces and remove dust and loose particles with vacuum or clean, dry, oil-free compressed air.
  - 2. Handle, mix and add components to achieve desired results and per manufacturer's recommendations.
  - 3. Follow substrate contour pitching or leveling surface.
- C. Topping:
  - 1. Apply topping as a self-leveling system.. The topping shall be applied in one lift with a
  - 2. Nominal thickness of one lift: 3/16 inch.
  - 3. Topping components: Resin, hardener and filler all supplied by single manufacturer.
  - 4. Hardener: Add to resin and thoroughly disperse by manufacturer recommended mechanical means. Add aggregate catalyzed mixture and mix to achieve a homogenous blend.
  - 5. Apply topping over horizontal surfaces using pin rakes, trowels or other approved systems.
  - 6. Immediately after placing, degass topping with 15/16 inch spiked roller.
  - 7. Broadcast quartz aggregate into wet material at rate of 1 lbs/sf or more to flood and overtop surface.
  - 8. Allow material to fully cure. Vacuum, sweep and/or blow to remove loose aggregate.
- D. Topcoat:
  - 1. Mix and apply per manufacturer recommended procedure.
  - 2. Topcoat components: Resin, hardener and filler as supplied by single manufacturer.

3. Apply topcoat at rate of 70 sf per kit (0.85 gal).
4. Non-Skid coating: Broadcast at rate of 1 lb per 100 sf and back roll into coating.

E. Nominal finish floor thickness: 1/4 inch.

### 3.5 FIELD QUALITY CONTROL

- A. Applicator Testing and Inspecting: Provide the following: Temperature: Air, substrate temperatures, relative humidity, and, dew point.
  2. Coverage rates: Monitor quantity of material used on area covered.
- B. Tolerances: Comply with dimensional and location tolerances specified in applicable sections, and as follows:
  1. Horizontal Lines and Levels: level by more than 1/8 inch in 10 feet (6 mm in 3 m), or 1/4 inch (12 mm) maximum.

### 3.6 ADJUSTING / CLEANING / PROTECTION

- A. Comply with Division 01 and the following:
  1. Cure flooring material in compliance with manufacturer's directions, taking care to prevent their contamination during stages of application and prior to completion of the curing process.
  2. Remove masking. Perform detail cleaning at installation completion leaving clean, smooth, unblemished surface

END OF SECTION