SECTION 07 18 23 – EPOXY OVERLAY TRAFFIC COATING SYSTEM

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*Bold text in brackets* [**sample**] *indicates a choice to be made; refer to editor's notes for guidance.*

*Metric units are in red font and in parentheses* (sample)*; these may be retained or deleted.*

*For specification questions, email:* Specifications@DaytonSuperior.com

*For technical assistance, contact Dayton Superior Technical Services: (866) 329-8724*

[www.DaytonSuperior.com](http://www.daytonsuperior.com/)

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Refer to Dayton Superior *Sure Seal Traffic Deck Coating, Unitex Pro-Poxy 45, and Unitex Pro-Flex Technical Data Sheets* (double-click icons below to open) for more information on this coating system.

 

This specification Section is intended for parking deck and other medium duty vehicular surface overlays; for bridge deck overlays, refer to Dayton Superior Section 03 18 26 – Epoxy Overlay Bridge Deck Coating Systems.

1. GENERAL
	* + 1. SUMMARY

Edit below to include primary scope of work under this Section

* + - * 1. Section Includes:

Two-part, two-course epoxy-urethane overlay coating system, used as a traffic coating for parking decks[ **and other vehicular surfaces**].

Graded aggregate broadcast media.

Epoxy healer/sealer for concrete slabs.

Semi-rigid epoxy joint filler.

* + - 1. RELATED SECTIONS

Edit Paragraph below to include other Sections that contain work related to work of this Section. Delete reference or revise number/title to reflect Sections actually included in Project.

* + - * 1. The following Section(s) contain work related to the work of this Section:

Section 03 01 30 – Maintenance of Cast-in-Place Concrete: Methods and materials for repairing existing concrete prior to applying overlay coatings.

Section 03 30 00 – Cast-in-Place Concrete: General requirements for mixing, placing, and finishing cast-in-place concrete floor slabs.

* + - 1. REFERENCES
				1. American Society for Testing and Materials (ASTM):

ASTM C 579 - Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.

ASTM C 881 – Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete.

ASTM C 884 – Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay

ASTM D 570 - Standard Test Method for Water Absorption of Plastics.

Retain the following two test method standards if system is to be applied to parking garage's lowest level (slab on grade):

ASTM D 4263 – Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.

ASTM F 1869 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

* + - * 1. American Concrete Institute (ACI):

ACI 548.8/548.8M – Specification for Type EM (Epoxy Multi-Layer) Polymer Overlay for Bridge and Parking Garage Decks.

* + - * 1. International Concrete Repair Institute (ICRI):

Technical Guideline No. 310.2R-2013: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair.

* + - 1. PREINSTALLATION MEETINGS
				1. Preinstallation Conference: Conduct conference at [**Project site**] <**Insert location**>.

Edit list of conference participants, if necessary.

* + - * 1. Review scope of Work expected. Require representatives of each entity directly concerned with concrete slab work to attend, including the following:

Contractor’s superintendent.

Installer.

Epoxy coating manufacturer's representative.

Architect's and/or Owner's representative (at their option).

Edit list of conference topics, if necessary. Some topics apply mainly to existing parking structures.

* + - * 1. Review the following, at a minimum:

Schedule.

Extent of Work.

Materials to be applied.

Surface repair procedures.

Procedures to be used for preparing surfaces to be coated.

Procedures to be used for applying coatings and aggregates.

Sequencing and staging of the Work, including:

Mockup panel requirements.

Area closures and temporary traffic routing, including temporary signage.

Pedestrian restrictions and designated walking areas, including maintaining emergency egress routes.

Material storage and staging.

Equipment to be used[**, including imposed loads on structures**].

Temporary heating and tenting.

Cleanup and disposal of waste materials.

* + - 1. ACTION SUBMITTALS
				1. General: Submit the following for approval. Do not proceed with work involving any action submittal until approval is obtained.
				2. Product Data: Technical data sheets for each product used. Include material physical characteristics, storage and application instructions, precautions and safety data, cleanup, and maintenance information.
			2. INFORMATIONAL SUBMITTALS
				1. General: Submit the following to the Owner for the Owner's information and records. If acceptable, and unless otherwise indicated, Informational Submittals will not be acted upon or returned.
				2. Safety Data Sheets (SDS) for all products used.

Coordinate "Qualification Data" Paragraph below with qualification requirements in Section 014000 "Quality Requirements" and as may be supplemented in "Quality Assurance" Article.

* + - * 1. Qualification Data: For Installer.
				2. Photographs: Submit photographic documentation of existing conditions prior to commencing work.

Include LEED submittals Paragraph only for LEED projects; coordinate with requirements selected in Part 2 for VOC limits.

* + - * 1. LEED Submittals:

Product Data for IEQ credit 4.2: For products of this Section containing volatile organic compounds (VOC), including liquid materials with zero VOC content.

Product Data for MR credit 4: For pre- and post-consumer recycled content of aggregate materials.

* + - 1. QUALITY ASSURANCE
				1. Manufacturer Qualifications: Company regularly engaged in the manufacturing of the products specified in this section, with at least 10 years' successful history manufacturing material specified herein.
				2. Installer Qualifications: Installer who is approved by, or acceptable to manufacturer for application of epoxy overlay systems required for this Project, with at least five (5) years' experience in application/installation of these products.
				3. Mock-up: Prepare one mock-up at the project site to demonstrate proficiency of the Installer, as well as to determine the application methods to produce desired effect. Mock-up shall be a minimum of 10’ x 10’. Use methods and materials proposed for use on the final installation, including aggregates. The approved mock-up shall serve as a standard of appearance for the final work to be produced.

Retain approved mockups during epoxy overlay coatings work to serve as a reference for aesthetic intent and quality standard during final application.

Approved mock-ups may be incorporated into the Work, if undisturbed.

* + - 1. DELIVERY, STORAGE, AND HANDLING
				1. Deliver products in original factory packaging, bearing identification of product, manufacturer, batch number, and expiration date.

Furnish Safety Data Sheets (SDS) to the project superintendent for each product.

Furnish SDS for each product to the jobsite concurrently with, or prior to delivery of each respective product to the site.

* + - * 1. Store products in a location protected from damage, construction activity, precipitation and direct sunlight, in strict accordance with the manufacturer's recommendations.

Do not allow liquid products to freeze.

Use products within published shelf life.

* + - * 1. Handle all products with appropriate precautions and care as stated on the Safety Data Sheet.
			1. PROJECT CONDITIONS
				1. Do not use products under conditions of precipitation. Use appropriate measures for protection and supplementary heating to ensure proper curing conditions in accordance with manufacturer's recommendations, if cold or inclement weather occurs during application.
				2. Do not apply coating materials when substrate temperature is less than 50 degrees F (10 degrees C).
				3. Do not apply coating materials when substrate and/or ambient temperatures reduce gel time of material to less than 10 minutes.
				4. Protect adjacent work from contamination due to mixing, handling, and application of epoxy overlay materials.
1. PRODUCTS
	* + 1. MANUFACTURERS

Add additional acceptable manufacturers, if desired.

* + - * 1. Acceptable Manufacturer:

Dayton Superior Corporation; 1125 Byers Road, Miamisburg, Ohio 45342; Tel: (877) 266-7732; Website: www.DaytonSuperior.com

Select only one of the following two Paragraphs. If first Paragraph is retained, select appropriate Division 01 Section.

* + - * 1. Requests for substitutions will be considered in accordance with provisions of Section [**01 25 00**] [**01 60 00**].
				2. Substitutions: Not permitted.
			1. MATERIALS
				1. Epoxy Overlay Material: ASTM C 881, Type III, Grade 1, Classes B and C, and as follows; values listed below that exceed the performance requirements of C 881 shall govern:

Product: Dayton Superior "Sure Seal Parking Deck Coating; powered by Unitex":

Component A: Resin.

Component B: Hardener.

Mixing Ratio: 1:1 by volume, Component A to Component B.

VOC Limit: 0 g/L.

Properties of Mixed Epoxy Resin:

Gel Time: 15 – 40 minutes at 73 degrees F (23 degrees C).

Viscosity: 1,200 – 2,000 centipoise (1.2 – 2.0 Pascal-second) at 77 degrees F (25 degrees C).

Cured Properties of Epoxy Resin:

Compressive Strength (aggregate-filled), minimum: 5,000 psi (34 MPa) after 24 hours, per ASTM C 579.

Tensile Strength, minimum: 3,000 psi (13.8 MPa), per ASTM D 638.

Elongation, minimum: 30.0 percent, per ASTM D 638.

Bond Strength, 14 Days Wet Cure (Hardened Concrete to Hardened Concrete): Minimum 2,500 psi (17.2 MPa) per ASTM C 882.

Water Absorption (24 Hour Immersion): Maximum 0.2 percent per ASTM D 570.

Thermal Compatibility, ASTM C 884: Pass.

Semi-rigid joint filler is for non-moving cracks and joints; cracks and joints subject to movement must not be coated.

* + - * 1. Semi-Rigid Epoxy Joint Filler:

Product: Dayton Superior "Unitex Pro-Flex."

Component A: Resin

Component B: Hardener.

Mixing Ratio: 1:1 by volume, Component A to Component B.

VOC Limit: 0 g/L.

Properties of Mixed Epoxy Resin:

Gel Time: 10 – 20 minutes at 73 degrees F (23 degrees C).

Viscosity: Self-leveling.

Cured Properties of Epoxy Resin:

Tensile Strength, minimum: 650 psi (4.5 MPa), per ASTM D 638.

Elongation, minimum: 70.0 percent, per ASTM D 638.

Shore A Hardness: 85 +/- 5.

Retain Paragraph below if a healer/sealer is required. This product is appropriate if the existing deck surface exhibits extensive small cracks. Consult manufacturer, if in doubt.

* + - * 1. Healer/Sealer: Low viscosity, low modulus epoxy polymer.

Product: Dayton Superior "Unitex Pro-Poxy 45."

Component A: Resin.

Component B: Hardener.

Mixing Ratio: 2:1 by volume, Component A to Component B.

VOC Limit: 0 g/L.

Properties of Mixed Epoxy Resin:

Gel Time: 14 – 20 minutes at 73 degrees F (23 degrees C).

Viscosity: 150 – 250 centipoise (0.150 – 0.250 Pascal-second) at 77 degrees F (25 degrees C).

Cured Properties of Epoxy Resin:

Tensile Strength, minimum: 2,500 psi (17.24 MPa), per ASTM D 638.

Elongation, minimum: 30.0 – 70.0 percent, per ASTM D 638.

Retain only one of the following two aggregate Paragraphs; verify availability of ground glass or steel slag aggregate in Project location, if used. Edit retained Paragraph to include specific project requirements, if needed. Other aggregate types are available, but should comply with the physical characteristics listed.

* + - * 1. Aggregate: Clean, dry, washed [**silica sand or basalt**][**steel slag**], free of dirt, clay, and impurities.

Moisture Content, maximum: 0.2%, per ASTM C 566.

Mohs Hardness: 6, minimum.

Gradation: Comply with ACI 548.8.

Color: <**Indicate Color**>

* + - * 1. Aggregate: Ground tempered glass fragments, free of impurities.

Moisture Content, maximum: 0.2%, per ASTM C 566.

Mohs Hardness: 6, minimum.

Gradation: Comply with ACI 548.8.

Color: <**Indicate Color**>

1. EXECUTION
	* + 1. EXAMINATION
				1. Inspect all areas involved in work to establish extent of work, access, and need for protection of surrounding construction.
				2. Protect all surroundings from overspray and spillage of epoxy materials including, but not limited to, windows, roofs, walkways, drives, and landscaping.

Retain Paragraph below if overlay system is to be applied to the lowest level of the parking garage (slab on grade). IF TESTS INDICATE MOISTURE LEVELS EXCEEDING THE MAXIMUM, CONTACT DAYTON SUPERIOR TECHNICAL SERVICES BEFORE PROCEEDING.

* + - 1. MOISTURE TESTING FOR SLABS ON GRADE
				1. If system is to be applied to a slab on grade, test slab for moisture vapor transmission, using one of the following testing procedures:

Plastic Sheet Method: Test per ASTM D 4263.

Maximum Relative Humidity: 75 percent.

Calcium Chloride Test: Test per ASTM F 1869.

Maximum Moisture Content: 3 lb. per 100 sq. ft. (0.147 kg per sq. m).

* + - * 1. Perform minimum 3 tests per the first 1,000 sq. ft. (93 sq. m), and 1 test for each additional 1,000 sq. ft. (93 sq. m).
				2. Do not proceed with work if any test result exceeds maximum test values.
			1. PREPARATION
				1. Do not apply epoxy overlay material over new concrete for minimum 28 days after placement.

Revise Paragraph below to suit Project. Concrete repair materials and procedures vary considerably, due to many factors, and are beyond the scope of this specification. Repair materials must be compatible with the epoxy overlay system. Consult Dayton Superior Technical Services.

* + - * 1. Repair broken, cracked, or deteriorated surfaces [**using patching materials and repair materials recommended by epoxy overlay manufacturer**][**per requirements of Division 03 Section "Maintenance of Cast-in-Place Concrete**].

Allow repair materials to properly cure prior to beginning overlay system application.

* + - * 1. Surface Profiling: Mechanically prepare all surfaces to receive epoxy overlay system, using blast-track, steel shot, abrasive scarifier, or other method, to achieve a concrete surface profile (CSP) of 5 to 9, per ICRI Technical Guideline No. 310.2R-2013.

Clean surface of loose material resulting from profiling procedures.

* + - * 1. Inspect surfaces to receive epoxy overlay systems; ensure that substrate is clean, sound, properly cured, free of standing water, coatings or curing compounds, foreign particles, oil, dust, grease, or laitance, that will adversely affect epoxy coating work.
				2. Ensure that air, material, and surface temperature is at least 50 degrees F (10 degrees C) and rising prior to beginning application.
			1. MIXING

The following Mixing Procedure is applicable to both the overlay material and the healer/sealer material:

* + - * 1. Mixing Procedure, General:

Precondition materials to minimum 65 degrees F (18 degrees C). Precondition materials to higher temperature if warranted by ambient and/or surface conditions.

Premix each component of epoxy materials separately before mixing together.

Measure and mix proper amounts by volume of Component A and B into a clean mixing container. Mix thoroughly using a slow speed drill (<450 RPM) with a clean, rust-free mixing paddle for 2 minutes minimum. Scrape sides of mixing container and mix an additional minute, minimum, until the two components are uniform.

Mix only the quantity that can be applied within the pot life of the material.

* + - 1. JOINTS
				1. Do not apply epoxy overlay system to building expansion joints or other moving joints. Protect such joints from intrusion of dirt, debris, removed surface material, and other foreign materials.
				2. Fill control joints and other non-moving joints with semi-rigid epoxy joint filler.

Clean and prepare joints per manufacturer's recommendations.

Mix and apply joint filler material per manufacturer's recommendations.

Allow joint filler material to cure as recommended by epoxy overlay system manufacturer's recommendations prior to commencing epoxy overlay application.

* + - 1. APPLICATION
				1. General: Follow all manufacturer's recommendations and written instructions when applying epoxy overlay systems.

Retain Paragraph below if healer/sealer is needed:

* + - * 1. Healer/Sealer Application:

Pour healer/sealer material onto the deck surface.

Spread material evenly with a squeegee or broom, working material into cracks until rejection.

Immediately after application, while the healer/sealer is still wet, begin overlay system application; do not broadcast aggregate onto the healer/sealer.

* + - * 1. Overlay Application: System can be applied by manual or mechanical means. Verify clearances and structural capabilities if heavy machinery use is planned.

Apply first epoxy course at coverage rate recommended by manufacturer, using 3/16-inch notched squeegee.

Immediately broadcast aggregate into first epoxy coat, before gel time elapses.

Broadcast aggregate to rejection (approximately 1- to 1.5 lb. per sq. ft. (4.9- to 7.3 kg per sq. m)).

After recommended set time, remove excess aggregate.

Do not commence second course of overlay surface until first course has set sufficiently to resist damage from application operations and equipment.

Apply second course, at manufacturer's recommended coverage rate.

Broadcast aggregate into second epoxy course to rejection (approximately 1- to 1.5 lb. per sq. ft. (4.9- to 7.3 kg per sq. m)).

After recommended set time, remove excess aggregate.

* + - * 1. Allow completed system to cure for manufacturer's recommended curing period prior to allowing traffic onto surface.
			1. FIELD QUALITY CONTROL
				1. Prior to commencing work, and periodically as new batches are mixed, test small amounts of the mixed epoxy to ensure proper curing and hardening. If automatic mixing and spreading equipment is used, test mixture at appropriate intervals.
			2. CLEANING
				1. Clean epoxy from tools and surfaces before it sets, using xylene or Unitex Citrus Cleaner.

If allowed to set, remove epoxy from surfaces by mechanical means.

* + - * 1. Remove all debris and excess materials from the job site and dispose of in accordance with all applicable regulations for waste disposal.

END OF SECTION 07 18 23