

An ACI Standard

Specification for Type EM (Epoxy Multi-Layer) Polymer Overlay for Bridge and Parking Garage Decks

Reported by ACI Committee 548

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American Concrete Institute
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Specification for Type EM (Epoxy Multi-Layer) Polymer Overlay for Bridge and Parking Garage Decks

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This Specification covers epoxy multi-layer (EM) polymer overlay for bridge and parking garage decks. Type EM polymer overlay incorporates a low-modulus epoxy binder and selected aggregate to produce a flexible, skid-resistant, and low-permeability overlay. The overlay may be used for both new construction and rehabilitation of existing structures. The overlay is placed by applying the neat epoxy binder to the surface and broadcasting aggregate. This Specification includes requirements for epoxy resin, aggregates, storage and handling, surface preparation, surface profile, mixing, placement, quality control and quality assurance.

Keywords: bridge decks; epoxy; multi-layer; parking garage decks; polymer overlay; surface preparation; low permeability.

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Foreword to checklists, p. 6

MANDATORY REQUIREMENTS CHECKLIST, p. 7**SUBMITTAL CHECKLIST, p. 7****SECTION 1—GENERAL****1.1—Scope**

1.1.1 This Specification covers materials and procedures for constructing a multi-layer, low-permeability epoxy polymer (Type EM) overlay for new construction and rehabilitation of bridge and parking garage decks, using mechanical, semi-automated, and fully-automated methods. Type EM polymer overlay incorporates a low-modulus, epoxy binder and selected aggregate to produce a flexible, skid-resistant, and low-permeability overlay. This Specification includes requirements for epoxy resin components, aggregates, storage and handling, surface preparation, surface profile, mixing, placement, quality control, and quality assurance.

1.1.2 This Specification supplements the contract documents and provides requirements for the contractor.

1.1.3 This Specification governs for construction within its scope, except the contract documents govern if there is a conflict.

1.1.4 This Specification governs if there is a conflict with its referenced standards.

1.1.5 The Contractor is permitted to submit written alternatives to any provisions in the Specification.

1.1.6 Do not use this Specification in conjunction with ACI 301 or ACI 350.5.

1.1.7 Ignore provisions of the Specification that are not applicable to the Work.

1.1.8 Values in this Specification are stated in inch-pound units. A companion specification in SI units is also available.

1.1.9 The Notes to the Specifier are not part of this Specification.

1.2—Interpretation

1.2.1 Unless otherwise explicitly stated, this Specification shall be interpreted using the following principles:

1.2.1.1 Interpret this Specification consistent with the plain meaning of the words and terms used.

1.2.1.2 Definitions provided in this Specification govern over the definitions of the same or similar words or terms found elsewhere.

1.2.1.3 Whenever possible, interpret this Specification so that its provisions are in harmony and do not conflict.

1.2.1.4 Headings are part of this Specification and are intended to identify the scope of the provision or sections that follow. If there is a difference in meaning or implication between the text of a provision and a heading, the meaning of the text governs.

1.2.1.5 Where a provision of this Specification involves two or more items, conditions, requirements, or events

connected by the conjunctions “and” or “or,” interpret the conjunction as follows:

“and” indicates that all of the connected items, conditions, requirements, or events apply

“or” indicates that the connected items, conditions, requirements, or events apply singularly

1.2.1.6 The use of the verbs “may” or “will” indicates that the Specification provision is for information to the contractor.

1.2.1.7 The phrase “unless otherwise specified” means the specifier included an alternative to the default requirements in Contract Documents.

1.2.1.8 The phrase “if specified” means the specifier may have included a requirement in Contract Documents for which there is no default requirements in this Specification.

1.3—Definitions

broadcast—to scatter over a wide area by hand or mechanical method.

cure time—time interval after mixing in which a polymer concrete system develops the required strength.

fully automated—metering, mixing of epoxy resin components with pumps and static mixing equipment and application of epoxy resin without the use of squeegees and broadcasting of aggregate

gel time—time interval after mixing that a liquid material exhibits a significant viscosity increase.

mechanical—mixing of epoxy resin components with drills and mixing paddles and spreading with squeegees and broadcasting of aggregate.

semi-automated—metering, mixing of epoxy resin components with pumps and static mixing equipment, and spreading of the epoxy resin with squeegees and broadcasting of aggregate.

1.4—Reference standards**1.4.1 AASHTO Standards**

AASHTO T 277-15—Standard Method of Test for Electrical Indication of Concrete’s Ability to Resist Chloride Ion Penetration

1.4.2 ASTM Standards

ASTM C566-13—Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying

ASTM C579-01(2012)—Standard Test Methods for Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacing, and Polymer Concretes

ASTM C778-13—Standard Specification for Standard Sand

ASTM C881/C881M-15—Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

ASTM C884/C884M-98(2010)—Standard Test Method for Thermal Compatibility between Concrete and an Epoxy Resin Overlay

ASTM C1202-12—Standard Test Method for Electrical Indication of Concrete’s Ability to Resist Chloride Ion Penetration

ASTM C1583/C1583M-13—Standard Test Method for Tensile Strength of Concrete Surfaces and the Bond Strength