



SECTION 1059

PROTECTIVE COATING MATERIAL

SECTION 1059.10 PROTECTIVE COATING—CONCRETE BENTS AND PIERS (URETHANE)

1059.10.1 Scope. This specification covers modified urethane or polyurethane elastomeric coating to be used as shown on the plans. This material will typically be applied under expansion devices for protection from deleterious agents in areas where aesthetics is not a high priority.

1059.10.2 General Requirements. The material shall be suitable for outdoor exposure and shall be resistant to deterioration by ultraviolet light. Additives for ultraviolet stabilization shall not be added after the original manufacturing process. The material shall be suitable for application to concrete surfaces. Surface preparation shall be in accordance with the manufacturer's recommendations. The material shall be suitable for application to obtain a thickness of 40 mils (1000 µm), dry film without runs or sags when applied to a vertical concrete surface. The material shall have a minimum shelf life, in unopened containers, of at least six months from the date of delivery.

1059.10.3 Cured Material. The cured material shall be in accordance with the following:

Protective Coating – Concrete Bents and Piers (Urethane)	
Property	Requirement
Shore A Hardness, ASTM D 2240 (Material shall be cured in 40 mil (1 mm) thick film for 7 days at 75 ± 2 F (24 ± 1 C) at 50% relative humidity. Test specimen shall be composed of plied pieces, to a minimum 1/4-inch (6 mm) thickness).	15, minimum
Tensile Strength, ASTM D 412 (Method and time of cure may be modified as recommended by the manufacturer).	45 psi (310 kPa), minimum
Elongation, ASTM D 412 (Method and time of cure may be modified as recommended by the manufacturer).	400 percent, minimum
Water Vapor Permeability, ASTM D 1653 or ASTM E 96, Method BW 40 mil (1 mm) film thickness.	0.8 perms, maximum

1059.10.4 Packaging. All two-component materials shall be prepackaged to exact mixing quantities.

1059.10.5 Manufacturer and Brand Name Qualification. Prior to approval and use, the manufacturer shall submit a representative one-gallon (3.8 L) sample to Construction and Materials. Upon approval of the material, the brand name and manufacturer will be placed on a list of qualified Urethane Protective Coating Agents for Concrete Bents and Piers. The sample shall be identified by brand name, manufacturer's name and address, and shall be accompanied by the following:

- (a) Manufacturer's complete material data showing typical test results for the properties specified, generic name of the major components of the material, mixing instructions, surface preparation and application instructions and intended use.

(b) Test results after 1000 hours of exposure in an accelerated weathering device, in accordance with ASTM D 822, Procedure B. The film thickness of test specimens shall be 40 mils (1000 μm) and shall show no cracking, flaking or blistering after exposure. Slight discoloration will be permitted.

(c) In lieu of the accelerated weathering test results required in [Sec 1059.10.5\(b\)](#), the manufacturer may submit a use history showing satisfactory performance for three years in at least two exposed applications. Name, address and telephone number of the users shall be included in the use history.

1059.10.6 Acceptance. The contractor shall furnish a manufacturer's certification stating that the material supplied is in accordance with all requirements specified and that the material furnished is of the same composition as originally qualified. The engineer reserves the right to sample the material at destination if deemed necessary.

SECTION 1059.20 PROTECTIVE COATING – CONCRETE BENTS AND PIERS (EPOXY)

1059.20.1 Scope. This specification covers two-component modified polyamide converted epoxy to be used as shown on the plans. This material will typically be applied under expansion devices where aesthetics is a high priority.

1059.20.2 Material. The material shall be suitable for application to obtain a minimum coating thickness of 6 mils (150 μm), dry film without runs or sags when applied to a vertical concrete surface. Pot life and method and time of cure shall be in accordance with the manufacturer's recommendation. The material shall be suitable for outdoor exposure and shall be resistant to deterioration by ultraviolet light. Additives for ultraviolet stabilization shall not be added after the original manufacturing process. The material shall have a minimum shelf life, in unopened containers, of at least six months from the date of delivery.

1059.20.2.1 Color. The color shall be clear or concrete gray.

1059.20.2.2 Finish. The finish shall be high gloss.

1059.20.3 Packaging. Two-component material shall be prepackaged to exact mixing quantities.

1059.20.4 Manufacturer and Brand Name Qualification. Prior to approval and use, the manufacturer shall submit a representative one-gallon (3.8 L) sample to Construction and Materials. Upon approval of the material, the brand name and manufacturer will be placed on a list of qualified Epoxy Protective Coating Agents for Concrete Bents and Piers. The sample shall be identified by brand name, manufacturer's name and address, and accompanied by the following information:

(a) Manufacturer's complete material data showing typical test results for the properties specified, generic name of the major components of the material, mixing instructions, surface preparation and application instructions and intended use.

(b) Test results after 1000 hours of exposure in an accelerated weathering device shall be provided. The tests shall be conducted in accordance with ASTM D 822 or ASTM G 154 using test cycle No. 2 defined in ASTM D 822, except that during the six hour period of darkness, the relative humidity of the air shall be $95 \pm 4\%$. If ASTM G 154 QUV exposure testing is used, Type A lamps shall be used.

1059.20.4.1 For either test, specific operating conditions shall be summarized and provided with the test results. The film thickness on test specimens shall be 6 mils (150 µm) and shall show no cracking, flaking or blistering after exposure. Only slight discoloration will be permitted.

1059.20.4.2 In lieu of the accelerated weathering test results required in [Sec 1059.20.4 \(b\)](#), the manufacturer may submit a use history showing satisfactory performance for three years in at least two exposed applications. Name, address and telephone number of the users shall be included in the use history.

1059.20.5 Acceptance. The contractor shall furnish a manufacturer's certification stating that the material supplied is in accordance with all requirements specified and that the material furnished is of the same composition as originally qualified. The engineer reserves the right to sample the material at destination if deemed necessary.

SECTION 1059.30 CONCRETE AND MASONRY PROTECTION SYSTEM

1059.30.1 Scope. This specification covers clear penetrating siloxane or silane based sealer for use as shown on the plans.

1059.30.2 Physical Properties. The sealer shall be breathable and non-yellowing and shall be in accordance with the following requirements:

Concrete and Masonry Protection System		
Specification Item ^a	Sealer Type	
	Vertical Application	Horizontal Application
Solids Content, percent by weight, min.	6.7	20
Reduction in Water Absorption, percent, min.	80	85
Reduction in Chloride Intrusion, percent, min.	82	85
Water Vapor Transmission, percent, min.	110	

^aTested in accordance with NCHRP 244 Series tests.

1059.30.3 Manufacturer and Brand Name Qualification. Prior to approval and use, the manufacturer shall submit a representative one-quart (1 L) sample to Construction and Materials. The sample shall be identified as to brand name, designation as to horizontal or vertical application, manufacturer's name and address, and shall be accompanied by the manufacturer's data and application sheets, and test results in accordance with [Sec 1059.30.2](#). The manufacturer shall submit certification that the material complies with all requirements of this specification. Upon approval of the material, the brand name and manufacturer will be placed on a list of qualified Concrete and Masonry Protection Systems.

1059.30.4 Field Approval. Prior to application of the sealer, including bulk purchase and delivery of products, the contractor shall prepare a minimum 12 x 12 inch (300 x 300 mm) application sample on each of the specified concrete or masonry products for the purpose of demonstrating the final effect, visual and physical/chemical, of the planned installation. The contractor shall proceed with work only after the engineer's acceptance of the test application for color and compatibility with the substrate.

1059.30.5 Acceptance. The contractor shall furnish a manufacturer's certification stating that the material supplied is in accordance with all requirements specified and that the material furnished is of the same composition as originally approved. The engineer reserves the right to sample the material at destination if deemed necessary.

SECTION 1059.40 SACRIFICIAL GRAFFITI PROTECTION SYSTEM

1059.40.1 Scope. This specification covers a sacrificial graffiti protection system for application to all surfaces as shown on the plans.

1059.40.2 Physical Properties. The sacrificial graffiti protection system shall be in accordance with the following physical properties and shall be chemically compatible with any other coatings to be used. The material shall be suitable for application to obtain a wet-film thickness of 4 to 6 mils (100-150 μm) without runs or sags when applied to a vertical surface.

Sacrificial Graffiti Protection System	
Item	Requirement
Melting Point, F (C), ASTM F 766	165 \pm 5 (74 \pm 2.8)
Solids Content, min., percent by weight, ASTM D 2834	26
Volatile Organic Content (VOC), lb/gal (g/L), max, ASTM D 3960	0.58 (70)

1059.40.3 Manufacturer and Brand Name Qualification. Prior to approval and use, the manufacturer shall submit a representative one-gallon (3.8 L) sample to Construction and Materials. The manufacturer shall submit documentation to Construction and Materials stating brand name, manufacturer's name and address and accompanied by the manufacturer's data and application sheets. The manufacturer shall submit certification, including specific test results, that the material complies with all requirements of this specification. Upon approval of the material, the brand name and manufacturer will be placed on a list of qualified Sacrificial Graffiti Protection Systems.

1059.40.4 Field Approval. Prior to application of the sacrificial graffiti protection system, including bulk purchase and delivery of products, the contractor shall prepare a minimum 12 x 12 inch (300 X 300 mm) application sample on each of the specified concrete or masonry products for the purpose of demonstrating the compatibility of the planned installation. If the sacrificial graffiti protection system is to be applied over previous coatings, the test specimen shall have already received these previous coatings. The contractor shall proceed with work only after the engineer's acceptance of the test application for appearance and compatibility.

1059.40.5 Acceptance. The contractor shall furnish a manufacturer's certification stating that the material supplied is in accordance with all requirements specified and that the material furnished is of the same composition as originally approved. The engineer reserves the right to sample the material at destination if deemed necessary.

SECTION 1059.50 TEMPORARY COATING – CONCRETE BENTS AND PIERS (WEATHERING STEEL)

1059.50.1 Scope. This specification covers a system for protection against absorptive staining from unpainted, corrosion-resistant steel during initial weathering as shown on plans.

1059.50.2 Physical Properties. The temporary coating shall be in accordance with the following physical properties and shall be compatible with any other coatings to be used. The material shall be suitable for application to obtain a wet-film thickness of 4 to 6 mils (100-150 μm) without runs or sags when applied to a vertical surface.

Temporary Coating – Concrete Bents and Piers (Weathering Steel)	
Item	Requirement
Melting Point, F (C) , ASTM F 766	165 ±5 (74 ±2.8)
Solids Content, min., percent by weight, ASTM D 2834	26
Volatile Organic Content (VOC), lb/gal (g/L), max, ASTM D 3960	0.58 (70)

1059.50.3 Manufacturer and Brand Name Qualification. Prior to approval and use, the manufacturer shall submit a representative one-gallon (3.8 L) sample to Construction and Materials. The manufacturer shall submit documentation to Construction and Materials stating brand name, manufacturer's name and address, and accompanied by the manufacturer's data and application sheets. The manufacturer shall submit certification, including specific test results, that the material complies with all requirements of this specification. Upon approval of the material, the brand name and manufacturer will be placed on a list of qualified Rust Staining Protection Systems.

1059.50.4 Acceptance. The contractor shall furnish a manufacturer's certification stating that the material supplied is in accordance with all requirements specified and that the material furnished is of the same composition as originally approved. The engineer reserves the right to sample the material at destination if deemed necessary.