



**SPECIAL PROVISIONS  
FOR  
DECK WATERPROOFING**

**Pottawattamie County  
IM-NHS-029-3(69)53--03-78**

**Effective Date  
June 20, 2017**

**THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**150266.01 GENERAL.**

These Special Provisions describe placement of multi-layered cold liquid-applied membrane waterproofing system on the new steel deck of the bridge and as shown on the Plans. The work shall include furnishing all labor, materials, tools, equipment and incidentals necessary to install the deck waterproofing as shown on the plans and specified herein.

**150266.02 REQUIREMENTS.**

**A. General.**

The deck waterproofing shall be an elastomer coating system suitable for metal surfaces.

1. The coating system shall consist of a primer and a spray-applied, fast cure deck membrane covered by a seamless, spray-applied, high build, deck membrane protection course.
2. The deck membrane shall be applied, at a minimum, to the thickness used for all submitted physical property tests.
3. The deck membrane shall pass the ASTM C836 Crack Bridging Test at 80 mils, or the thickness applied shall be at least equal to the thickness used by the manufacturer for the ASTM C836 Crack Bridging Test.
4. The deck membrane shall meet AREMA Chapter 8, Section 29.9.10, Cold Applied Waterproofing Membrane, and shall be applied at a minimum thickness of 80 mils, or the deck membrane thickness applied shall be at least equal to the thickness used by the manufacturer to pass the ASTM C836 Crack Bridging Test. Primer is required.

5. The coating system shall be capable of sealing across expansion joints using an Expansion Joint System without the need to use a separate gland and bonding agents on the membrane. This will assure a continuous waterproofing system across the entire deck.
6. The coating system shall have a final color of green or orange to make it easy to identify any surface damage to the deck membrane protection course.
7. The coating system shall produce a seamless, continuous, resistant to water and resistant to chemical attack.

**B. Project Conditions.**

**1. Environmental Requirements.**

Install system when air and substrate temperature is above 40°F and substrate is above dew point.

**2. Personnel Requirements.**

Provide protective clothing, gloves, and respirators for use by installers as required.

**C. Quality Control Provisions.**

1. **Manufacturer Qualifications:** The manufacturer must have a minimum 5 years' experience providing similar coating systems on railroad bridge decks in North America. The manufacturer should be a primary blender with proprietary formulations, be a member of an Authorized Contractor program, and have the capacity to provide field technical services as required and manufacturer to issue warrantee to the Railroad.
2. **Contractor Qualifications:** The Contractor must hold a current Authorized Contractor Certificate from the manufacturer.
3. Schedule pre-installation conference to review installation schedule, shut down, and restricted access procedures. The Engineer and Contractor's Superintendent must attend.
4. Inspect surface preparation and application procedures, and review proposed dry film thickness at each installation location.
5. **Delivery, Storage, and Handling.**
  - a. Deliver product in manufacturer's original containers.
  - b. Store product in warm, dry condition.
  - c. Replace product damaged by shipment, weather, or job conditions.

**150266.03 MATERIALS.**

- A. Select one of the following pre-approved coating systems for the deck waterproofing. Use the same system for the primer coat, deck membrane coat and deck membrane protection course. No other alternate systems will be accepted.
  - Bridge Preservation - Bridge Deck Membrane with Integrated Ballast Mat.
  - D.S. Brown - Deckguard with Liquid Ballast Mat.
- B. The following minimum thickness of coating systems shall be installed as recommended by each individual manufacturer:
  - Bridge Preservation - Bridge Deck Membrane with Integrated Ballast Mat - 330 mils.
  - D.S. Brown - Deckguard with Liquid Ballast Mat - 450 mils.

- C. Steel Bridge Deck Steel Primer Coat: The primer shall be of the type compatible with the substrate and membrane type as recommended by the manufacturer.

**D. Deck Membrane Coat.**

1. The deck membrane coat shall be a rapid curing, two-component, 100% solids, spray-applied coating material as manufactured by Bridge Preservation, LLC of Kansas City, Kansas or D.S. Brown of North Baltimore, Ohio.
2. The following minimum thickness of the deck membrane shall be applied as recommended by each individual manufacturer:
  - a. Bridge Preservation - Bridge Deck Membrane = 80 mils
  - b. D.S. Brown - Deckguard = 80 mils
3. Deck membrane physical properties shall conform to AREMA Ch. 8, Table 8-29-3 and as outlined below:

Property	Test Method	Required Value
Solids Content		100%
Crack Bridging Test (1/8")	ASTM C836	10 Cycles @ -26°C
North American Ballast Test	2 Million Cycles	No Damage
Elongation	ASTM D638	>80%
Tensile Strength	ASTM D638	>930 psi
Adhesion to Steel	ASTM D4541	>290 psi
Adhesion to Concrete	ASTM D4541	>100psi
Water Vapor Transmission	ASTM E96, Procedure B or BW	Equal to or Less than 0.2 perms
Accept Direct Ballast		60 Minutes
Accept Construction Traffic		

**E. Deck Membrane Protection Course.**

1. The deck membrane protection course shall be a rapid curing, 100% solids, spray-applied coating material integrated with a protective elastomeric filler or layer as manufactured by Bridge Preservation, LLC of Kansas City, Kansas or D.S. Brown of North Baltimore, Ohio.
2. The following minimum thickness of deck membrane protection course shall be installed as recommended by each individual manufacturer:
  - a. Bridge Preservation - Integrated Ballast Mat = 250 mils consisting of Bridge Deck Membrane broadcast with a proprietary elastomeric filler
  - b. D.S. Brown - Liquid Ballast Mat = 370 mils consisting of a 20 to 30 mil adhesive layer of Deckguard atop the deck membrane coat, a layer 8mm pre-formed rubber mat set into the wet adhesive layer, a polymer primer and a 40 mil top coat of Deckguard deck membrane.
3. The deck membrane protection course shall integrate seamlessly with the underlying deck membrane coat.

**F. Equipment.**

Provide spray equipment suitable for use with products specified.

**150266.04 CONSTRUCTION.**

**A. Preparation.**

1. Provide a clean, sound metal substrate.
2. Sand blast metal surfaces to remove laitance and other contamination and provide suitable 3 to 5 mil blast profile.
3. Prepare metal surfaces to SSPC- SP10 White Blast or better.

**B. Inspection.**

1. Prior to application of primer, inspect and approve substrate preparation.
2. Test prepared surface using Elcometer adhesion testing (ASTM D4541). Minimum pull strength is 290 psi by bonding primer to steel substrate.
3. Metal surfaces must be above dew point prior to application.
4. Mask protected surfaces prior to spray applications.
5. Erect spray curtains and partitions as required.

**C. Installation.**

1. Metal surfaces must be dry, rust-free, and have proper SSPC profile and preparation.
2. Spray or roll steel primer at 400 to 600 square feet per gallon over steel surfaces to receive coating system. Allow primer to go tack-free before spraying deck membrane coat.
3. Reapply primer if it has set for more than 18 hours.
4. Spray base coat of deck membrane over primed surfaces at manufacturer's recommended thickness outlined above.
5. Retouch coat by filling low spots or areas with inadequate thickness.
6. Spray additional deck membrane coats to achieve specified deck membrane thickness. Retouch as required.
7. Install deck membrane protection course per manufacturer's recommendations.

**D. Field Quality Control.**

1. Perform dry film thickness tests of the deck membrane coat in accordance with SSPC-PA2 (Measurement of Dry Coating Thickness) as required. Deck membrane gels too rapidly to perform wet film test.
2. Use magnetic or ultrasonic test equipment, destructive testing, or stroke per gallon method of assuring proper film thickness of the deck membrane coat.

- a. Spray equipment is calibrated and tested to a stroke count per gallon of product sprayed. This is suitable for thickness assurance on most projects.
  - b. Ultrasonic testing is usually accurate to +/- 5%.
  - c. Repair destructive testing areas of the deck membrane by re-spraying or by filling with special two component gun grade material provided by manufacturer.
3. Maintain spray and other installation equipment in proper operating condition throughout installation. Provide reserve equipment as required.

**E. Cleaning.**

1. Clean spills and oversprays as they occur.
2. Consult manufacturer's literature and Material Safety Data Sheets for proper cleaning products and methods.
3. Clean the site to Railroad's and Engineer's satisfaction prior to final acceptance.

**F. Protection.**

1. Protect installed work prior to acceptance by Railroad.
2. Place ballast after deck membrane protection course has cured for a minimum of 1 hour.

**150266.05 METHOD OF MEASUREMENT.**

Measurement for Deck Waterproofing, in square feet deck waterproofing which have been incorporated into the completed and accepted work. The quantity will be based on the summation of the entire area of the horizontal surface of the floor plates, the inclined vertical surface of the ballast stop plates and other areas as shown on the Plans.

**150266.05 BASIS OF PAYMENT.**

For the quantity of Deck Waterproofing placed, as measured above, will be paid for at the contract unit price per square foot for Deck Waterproofing. The above price will be full compensation for furnishing and placing the multi-layered coating system, including the primer, field touch-up, and all other materials, labor, equipment and incidentals necessary to complete this item as shown on the Plans and specified herein.