

SECTION 418 – BRIDGE STRUCTURAL REPAIR

418.02 MATERIALS

Under the materials list, change Subsection reference for Non-Metallic, Non-Shrink Mortar or Grout to 905.13. Add the following to the Materials List:

Non-shrink High Strength Mortar..... 905.12

[Note to Designer: "Substructure Waterproofing" is required for small areas and spall repair areas (i.e. miscellaneous structural repair contracts) "Substructure Membrane Waterproofing" is required to waterproof entire substructure elements. "Substructure Membrane Waterproofing" shall not be applied to piers located below continuous superstructure spans.]

418.06 SUBSTRUCTURE WATERPROOFING

Include the existing provisions of this Subsection in a new Paragraph (A) entitled "Substructure Waterproofing" as follows:

(A) Substructure Waterproofing

The following is added after the first paragraph:

Adjacent roadways, waterways, sidewalks, and ROW of others shall be protected during the cleaning operations through the use of a containment system. The Contractor shall contain, collect and dispose of all materials off NJTA ROW at completion of the cleaning operations. The Contractor is alerted to the fact that abutment bridge seats and pier caps may be covered with debris. Contractor shall clean entire bearing areas, pier top and abutment seats prior to preparing concrete surfaces for waterproofing.

Delete existing Paragraphs (A) and (B), and add the following Subparagraphs (1) and (2):

(1) Pier

The waterproofing material shall be applied to the pier cap seat, exposed concrete bearing pads and extend down the vertical surface one foot below the seat elevation, or to the limits shown on the Plans.

(2) Abutment

The waterproofing material shall be applied for the full height of the front face of the abutment backwall and headblock, the abutment seat and drainage trough, exposed concrete bearing pad surfaces and the vertical front face for the abutment extended one foot below the seat elevation or to the limits shown on the Plans.

The following Paragraph (B) is added:

(B) Substructure Membrane Waterproofing

Concrete placed for repair of spalls, as specified in Subsection 418.03, shall be fully cured and all other work in the vicinity of the substructure unit shall be completed before waterproofing material is applied. The concrete surfaces to

receive the waterproofing membrane system shall be thoroughly cleaned by sandblasting to remove all existing coatings, laitance, grease, rust, waxes, algae, slime and pollutant coatings. Masonry plates to be waterproofed shall be cleaned in accordance with SSPC-SP3. Cleaning shall include the removal of existing waterproofing materials which are peeling or otherwise deteriorated by cutting, scraping and sandblasting. Existing asphalt and concrete spillage shall be removed. If waterblasting is used, the equipment must be capable of a minimum of 4,000 psi.

The Contractor is alerted to the fact that abutment bridge seats and pier caps may be covered with debris. Contractor shall clean entire bearing areas, pier top and abutment seats prior to preparing concrete surfaces for waterproofing.

The Contractor shall provide a containment system to prevent blasting medium and debris from falling from pier caps. The system shall be approved, by the Engineer, prior to beginning work. Adjacent roadways, sidewalks, and ROW of others shall be protected during the cleaning operations through the use of temporary shielding or other containment measures. The Contractor shall contain, collect and dispose of all materials off NJTA ROW at completion of the cleaning operations.

After thorough cleaning of the substructure unit, any depression deeper than ½ inch on the horizontal surfaces shall be filled with non-shrink high strength mortar.

Prior to application of the waterproofing membrane, the perimeter of the steel masonry plate at the interfaces with the concrete substructure shall be sealed. .

Material, air and surface temperature shall range between 32 degrees F and 85 degrees F during application and cure, unless a special formulation is being used and the manufacturer has been consulted and issues a written approval. The maximum application/substrate/material temperature shall be 104 degrees F. Material shall not be placed when rain is forecast within 24 hours. Relative humidity at the time of application in the specific location of the application shall be less than 85 percent and the surface temperature shall be at least 5 degrees above the dew point.

Sufficient material to place the entire membrane system shall be in storage at the site prior to any field preparation, so that there shall be no delay in procuring the material for each day's applications.

The material shall be stored so as not to be damaged from the elements and to insure the preservation of their quality and fitness for the work. The storage space shall be kept clean and dry, shall contain a recording high-low thermometer, and the temperature of the storage space shall not fall below or rise above that recommended by the manufacturer. Every precaution shall be taken to avoid contact with flame.

Stored materials, even though accepted before storage, shall be inspected by the manufacturer prior to their use in the work and shall meet the requirement of the Contract at the time of use. Any material which is rejected because of failure to meet the required tests or that has been damaged so as to cause rejections shall be immediately replaced at no additional cost to the Authority.

The entity ("applicator") performing the work of this section shall submit proof of having the skill and experience necessary for the installation of the specified membrane system placed on jobs of equal complexity to this Contract. Such proof shall include but not be limited to the name and resume of the individual superintendent who will be responsible for the field work. The resume shall list experience with such installation, including the project name, the name of the owner for whom the work was performed and the scope of the work performed, and shall be submitted to and approved by the Engineer prior to commencing these operations. A Technical Representative from the material manufacturer must be on site for such time until the applicator has demonstrated competence in material application as determined by the Engineer.

All handling, mixing and addition of components for the primer and waterproof coating shall be performed in a safe manner to achieve the desired results in accordance with the manufacturer's recommendations as approved or directed by the Engineer. The system shall not be applied when weather or surface conditions are such that the material cannot be properly handled, sprayed, and cured within the specified requirements.

SECTION 923 - MISCELLANEOUS

[Note to Designer: "Substructure Waterproofing" is required for small areas and spall repair areas.
"Substructure Membrane Waterproofing" is required to waterproof entire substructure elements.
"Substructure Membrane Waterproofing" shall not be applied to piers located below continuous superstructure spans

923.06 DAMPPROOFING AND WATERPROOFING

The following Paragraph (H) is added:

(H) Waterproofing Systems for Substructures

Substructure Waterproofing shall conform to the requirements of (E) Epoxy Resin Waterproofing.

Substructure Membrane Waterproofing shall consist of a primer and the membrane. The membrane system must originate from one manufacturer to insure compatibility. The membrane system shall be Eliminator by Stirling Lloyd Products, Inc., North Haven, CT, Wabo Guardian "Traffic Deck System" by Watson Bowman Acme, Amherst, NY 716-691-7566 or an approved equal. The membrane shall conform to the following:

<u>Property</u>	<u>Test Method</u>	<u>Criteria</u>
Solids Content		100%
Coverage Rate 80 mils (2mm)		20.5 sq. ft./gal
Cure Time		30 minutes at 68 degrees F
Water Vapor Transmission	ASTM E96	4.3 g/m ² /day
Water Absorption	ASTM D570	<0.5%
Tensile Strength	ASTM D638	400 psi (min)
Elongation (min)	ASTM D638	100%
Adhesion to Concrete	ACI 503A	100 psi (min)
Crack Bridging	ASTM C836	Pass at 15 degrees F 62.5 mils at 25 cycles
<u>Resistance To:</u>		
Ethylene Glycol	ASTM D543	Pass
Calcium Chloride	ASTM D543	Pass
Diesel Fuel	ASTM D543	Pass
Gasoline	ASTM D543	Pass

The following samples and information along with the current published technical product data and material safety data sheets for the system selected shall be submitted to the Engineer at least one month before application of the waterproof membrane system is anticipated by the Contractor:

- The design mix for the membrane system, including samples for testing and approval prior to ordering any materials for the waterproofing membrane.

- *Primer Coat – 1 quart*
- *Liquid Components of the membrane – 1 quart each*
- *Hardener Powder*
- *Aggregate – 25 lbs.*
- *Written procedures for the surface preparation, application, quality control and placement of the waterproof membrane.*
- *Manufacturer’s Literature including descriptive data and specific recommendations for surface preparation, mixing, and application of all materials, and a copy of the manufacturer’s quality assurance program listing all in-house testing criteria.*
- *Manufacturer’s “Materials Safety Data Sheets” for each respective product to be used.*