

**ITEM 595.98209830--25 - ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING**

**MEMBRANE SYSTEM** 05/26/2013 11:19 PM05/26/201305/26/2013 11:19 PM05/26/201305/26/2013 11:19 PM05/26/201312/29/2019 2:49 PM

**1. DESCRIPTION:**

1.01 4.01—Furnish and install a spray-applied waterproofing membrane system in accordance with the contract documents, and as directed by the Engineer. Include all 'final surface preparation' and quality-control testing of: i) substrates being waterproofed and ii) the applied membrane system.

1.02 Except as modified by this special specification, all work for a spray-applied waterproofing membrane system shall be done in accordance with the NYSDOT Approved Material Detail Sheets for the specific spray-applied waterproofing membrane system being furnished.

1.03 A "severe braking" in-service environment exists, and the use of a Broadcast Aggregate, bonded or fused to the spray-applied waterproofing membrane, is required.

1.04 The spray-applied waterproofing membrane system will include the following fully compatible components: i) a substrate primer, ii) a 2 coat spray-applied waterproofing membrane, iii) a broadcast aggregate, and iv) a tack coat system

A. The **Substrate Primer** shall penetrate and seal a substrate's surface, enhancing the bond between the substrate's surface and the applied waterproofing membrane.

B. The **Spray-applied Waterproofing Membrane** shall be a 2 coat waterproofing membrane that prevents surface water from contacting a concrete substrate, resists deformation and degradation by transient vehicular loadings (both during and after construction), maintains adhesion to installed Substrate Primers and the concrete substrate, and maintains adhesion to the tack coats and surfacing materials installed atop the waterproofing membrane.

C. The **Broadcast Aggregate** shall be broadcast atop the uncured surface of the second coat of a waterproofing membrane system or atop the uncured surface of a tack coat system component, dependent on the spray-applied waterproofing membrane system employed; bonding the Broadcast Aggregate to the membrane and creating a textured surface to interlock surfacing materials to the membrane.

D. The **Tack Coat System** shall be one or more components applied to the cured waterproofing membrane. The final component of each tack coat system is a polymer modified bitumen 'heat activated' adhesive. The tack coat system binds the waterproofing membrane to installed hot mix asphalt (HMA) surfacing materials. The heat of applied HMA activates the applied final bitumen component of each system, and binds the HMA to the waterproofing membrane.

1.05 **Definitions:**

A. **Manufacturer's Representative**—The designated person(s) currently certified as trained by the Manufacturer, and having significant field experience, in the proper furnishing and installation of the spray-applied waterproofing membrane system employed.

B. **Supplier**—the company under contract to the Contractor to supply all materials components for the spray-applied waterproofing membrane employed.

C. **Applicator**—a subcontractor, currently authorized or licensed by the Manufacturer under contract to the Contractor to perform all on-site work paid for under this specification; including all on-site handling and storage of the membrane system components, the 'final surface preparation' of the substrate, and the installation of the spray-applied waterproofing membrane system.

D. **Final Surface Preparation**—Under other pay items; the Contractor shall prepare the substrate surface: (i) to a surface condition meeting the surface cleanliness and surface

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~~1.02 This work shall consist of the preparation of the concrete surfaces to be waterproofed, and the furnishing, installation and testing of the spray applied Eliminator Bridge Deck Waterproofing System in accordance with this specification and the contract documents.~~

2.01 Use a Spray-applied Waterproofing Membrane System for concrete surfaces appearing on the NYSDOT Materials Bureau approved list titled “Materials and Equipment Approved List (for Use on NYSDOT Projects)”, Sub-section: “Concrete, Waterproofing Membranes”.

2.02 The spray applied waterproofing membrane system to be furnished and applied shall be the spray-applied waterproofing membrane system employed shall meet the requirements found under their respective application and quality-control testing sections in the applicable NYSDOT Approved Material Detail Sheets and this specification.

~~Deck Waterproofing System manufactured by:~~

~~Stirling Lloyd Products, Inc.  
152 Rockwell Road, Building 'A'  
Newington, CT 06111  
Telephone: 860-666-5008  
FAX: 860-666-5106~~

~~2.02 — The fully compatible components of the Eliminator Bridge Deck Waterproofing System consist of the following components manufactured by Stirling Lloyd Products, Inc.:~~

~~A. **Primer**, the primer shall be Stirling Lloyd Products' PAR1 Primer for concrete substrates, and Stirling Lloyd Products' MR6 Primer for miscellaneous steel substrates.~~

**B. Waterproofing Membrane**—the waterproofing membrane shall be Stirling Lloyd Products' spray applied **two coat** Eliminator waterproofing membrane.

~~C. Tack Coat~~ the tack coat shall be Stirling Lloyd Products' SA1030 Tack Coat.

**2.03 Curing Period Ladders:** Each component of the spray-applied waterproofing membrane system must reach a cured condition before it can be overcoated with the succeeding component of the membrane system; and in the case of the tack coat component, it must reach a cured condition before it can be overlaid with asphalt pavement. The period of time required by a membrane component to cure is called the 'curing period' for that component. The curing period for each component to reach a cured condition will vary depending on: (i) the ambient temperature of the atmosphere, (ii) the solar insolation available, (iii) the temperature of the component and (iv) the temperature of the substrate, during that time period. Critical curing period estimates for each

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**ITEM 595.98209830--25 - ~~ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING~~**

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**2. MATERIALS: 3. CONSTRUCTION**

**DETAILS:**-(cont'd)

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**2.09 Basis of Acceptance:**

Spray-applied waterproofing membranes will be accepted on the basis of the Manufacturer's name, the brand name of the system, and NYSDOT approved Material Detail Sheets appearing on the NYSDOT's Approved List of Materials and Equipment for use on NYSDOT Projects.

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~~2. MATERIALS: (cont'd)~~

## 2. MATERIALS: (cont'd)

~~2.10 NO SMOKING MUST BE STRICTLY OBSERVED AT ALL TIMES ON SITE IN THE VICINITY OF THE MATERIALS AND THE APPLICATION.~~

### 3. CONSTRUCTION DETAILS:

3.01 **General:**

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3.01.I ~~General:General:~~ (cont'd)

- ~~3. CONSTRUCTION DETAILS: (cont'd)~~

~~3.01 General: (cont'd)~~

2. When applicable, the inside surfaces of weep tubes shall be coated with each spray-applied component of the spray-applied waterproofing membrane system to a depth of at least 1 inch below the deck surface. The second of two coats of Spray-applied Waterproofing Membrane shall be tack free before installation of a wire mesh square over the weep tubes. Each side of the wire mesh square shall be 3 inches larger than the diameter of the weep tube opening and shall be adhered to the membrane as per the recommendations of the Manufacturer.

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- M. When applicable, the inside surfaces of weep tubes shall be coated with each component of the Eliminator Bridge Deck Waterproofing System to a depth of at least 1 inch below the deck surface. The Eliminator membrane coats shall be tack free before installation of a wire mesh square over the weep tubes. Each side of the wire mesh square shall be 2 inches larger than the diameter of the weep tube opening and shall be adhered to the membrane as per the recommendations of Stirling-Lloyd Products, Inc.

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- G. NO SMOKING MUST BE STRICTLY OBSERVED AT ALL TIMES ON SITE IN THE VICINITY OF THE SPRAY-APPLIED WATERPROOFING MEMBRANE SYSTEM MATERIALS, DURING BOTH THE MATERIALS STORAGE AND INSTALLATION.

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2. ~~Acceptable~~ he-adhesion of of the Stirling Lloyd Products, Inc. PAR1 primer Substrate Primer to the substrate, and/or

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**3.03.D Tensile Bond Strength Tests**General:  
(cont'd)

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spray-applied waterproofing membrane system **Eliminator Bridge Deck Waterproofing System** to the substrate.

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test, (ii) the two components being tested for adhesion between each other at that location, and (iii) the test force at which an adhesion failure occurred, (iv) the interface location between any two components at that location where the failure occurred, (v) the contact area of the dolly, and (vi) the calculated Minimum Tensile Bond Strength "pull-off" (adhesion) Test Values at that location ( given in units of PSI).

**6.H.** Additional Tensile Strength Bond Tests may be required using an Elcometer Adhesion Tester Model 106, or similar, at locations and a frequency determined by the Engineer.

**3.04 Substrate Preparation:**

~~7. At no additional cost; all Tensile Strength Bond Tests will be performed and documented by the Applicator using the Stirling Lloyd Products, Inc. "QA & Materials Record" form and reported to the Stirling Lloyd Products, Inc. Representative and the Engineer.~~

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**3. CONSTRUCTION DETAILS:** (cont'd)

**3.04.A.1 Substrate Preparation:**  
(cont'd)~~General:~~ (cont'd)

**3. CONSTRUCTION DETAILS:** (cont'd)

**3.02 Substrate Preparation:**

**A. Preparatory Site Inspection To Be Performed By The Contractor, The Manufacturer's Representative and And The Applicator With The Contractor:**

1. Prior to the execution of the work performed under this specification; ~~executed by others under other pay items~~, the entire existing concrete bridge deck substrate will be exposed and inspected by the Contractor ~~under other pay items~~ to identify and map required concrete bridge deck repairs including: (i) concrete bridge deck areas to receive full and partial depth repair, (ii) structural cracks in the concrete bridge deck to be repaired and (iii) concrete substrate surface areas to be mechanically abraded to remove unsound punky cement and unbonded aggregate.

Unsound ~~punky~~ concrete ~~substrate~~ surfaces will be incapable of developing a Tensile Bond ~~Strength~~ Test ~~strength~~ "pull-off" (adhesion) test value greater than or equal to ~~400~~150 psi (with failure occurring in the concrete).

2. At no additional cost; at the time the entire existing concrete bridge deck is exposed and inspected by the Contractor to identify and map required concrete bridge deck repairs; ~~the Manufacturer's Representative and the Applicator will be present to review the preliminary mapped limits of all bridge deck repairs with the Contractor, and to inspect the exposed concrete bridge deck substrate for non-structural surface defects to be accepted or repaired by the Applicator when the Eliminator Bridge Deck Waterproofing Systems spray-applied waterproofing membrane system is installed by the Applicator.~~

3. At no additional cost; at the time the entire existing concrete bridge deck is exposed and inspected by the Contractor to identify and map required concrete bridge deck repairs; the ~~Representative~~Manufacturer's Representative and the Applicator will inspect the exposed concrete bridge deck for prior concrete bridge deck repairs that could contain incompatible mortar and/or concrete repair materials that could prohibit the development or maintenance of an adequate bond of the ~~Stirling Lloyd PAR+Substrate~~-Primer to an existing concrete repair's surface. Suspected areas of incompatible concrete repairs will be Tensile Bond ~~Strength~~ Tested by the Applicator.

- B. Under other contract pay items Prior and prior** to the execution of the work performed under this specification; the repair of the existing concrete bridge deck will be completed, with

~~C.~~ unsound concrete substrate surfaces identified, removed and repaired by work performed ~~by the Contractor under other contract pay items by the Contractor.~~

- ~~D-C.~~ Under other contract pay items and ~~p~~Prior to the execution of the work performed under this specification; the Contractor shall provide existing concrete substrate surfaces free of dirt, oil, grease, asphalt pavement, asphalt tack coat material, and any materials which may inhibit bonding of the ~~PAR+Substrate~~ Primer to the existing substrate surfaces.

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~~E.D.~~ Under other contract pay items and prior~~Prior~~ to the application of the ~~PAR1~~-Substrate Primer; new full depth, partial depth and surface concrete repairs constructed with a non-rapid-set moisture cured concrete shall be cured a minimum of seven days.

~~E.~~Under other contract pay items and prior~~Prior~~ to the application of the ~~PAR1~~-Substrate Primer; new full depth, partial depth and surface concrete repairs constructed with a rapid-set chemically cured concrete shall be cured: (i) to a minimum required compressive strength of 2500 psi, and (ii) until that time that a minimum Tensile Bond Strength Test ~~strength~~ "pull-off" (adhesion) test value greater than or equal to ~~100~~150 psi can be achieved (with failure occurring in the concrete exposing aggregate).

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### ~~3.02 Substrate Preparation: (cont'd)~~

**G.F. Deck Sounding by Applicator** - Prior to the application of the **PAR1 Substrate Primer**; the concrete bridge deck area and perimeter concrete curb area surfaces, detailed in the contract plans to be waterproofed with the **Eliminator Bridge Deck Waterproofing system** **spray-applied waterproofing membrane system**, shall be sounded by the Applicator to reveal deck concrete areas where additional surface preparation or concrete repair may be required to achieve the minimum required tensile bond strength between the **PAR1 Substrate P**-primer and the concrete substrate.

**G-Surface Texture** - To assure an excellent bond of the Substrate Primer to a concrete substrate;  
pPrior to the application of the PAR1 Substrate Primer; substrate surface texture  
irregularities must be prepared.

Additionally, areas of minor surface deterioration of 1/2 inch and greater in depth may have to be repaired by the Applicator to prevent possible ponding, and excessive usage, of the components of the spray-applied waterproofing membrane system ~~Eliminator Bridge Deck Waterproofing System~~. Thin surface patch repairs to eliminate component ponding are to be made as recommended by the Manufacturer's Representative. The extent and locations of thin surface patches to be made requires the approval of the ~~Stirling Lloyd Products, Inc.~~ and approved by the Engineer Representative before the waterproofing membrane system is applied.

1. Static cracks less than 0.02 inches may be oversprayed by the Applicator without pretreatment.
- ~~2. 2.~~ Cracks greater than 0.02 inches wide that are considered by the Engineer to be static (i.e., no significant movement due to loading or temperature changes over a range of [-20° F to 100° F]) shall be treated by the Applicator as follows:
  - ~~a. a.~~ the crack shall be routed out along its entire length with a disc cutter or other suitable means to a width of at least ½ inch and a depth of at least ½ inch.
  - ~~b. b.~~ The resulting debris shall be removed using clean, dry, oil-free compressed air or an industrial vacuum.

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### 3. CONSTRUCTION DETAILS: (cont'd)

### 3.04 Substrate Preparation:

(cont'd)~~General: (cont'd)~~

4. ~~As recommended by the Manufacturer's Representative and approved by the Engineer, c4. Construction joints in the deck slab shall be treated as cracks and treated/repared as recommended by the Stirling Lloyd Products, Inc. Representative's and approved by the Engineer.~~

### ~~3.02 Substrate Preparation: (cont'd)~~

J-K. At the time of the application of the PAR+Substrate Primer; all concrete substrate surfaces will be free from oil, grease, curing compounds, shutter release oils, loose particles, moss, algae growth, rust, friable matter, bitumen, asphalt, dirt and all other contaminants.

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**L.M. Substrate Preparation Preparation-Quality Control Testing - Tensile Bond Strength Testing:**

- ### **3.05 Substrate Primer - Application and Curing :**

~~The exact locations of Tensile Bond Strength Tests will be recommended by the Stirling Lloyd Products, Inc. Representative and approved by the Engineer~~

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**ITEM 595.98209830--25 - ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING**

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**3. CONSTRUCTION DETAILS: (cont'd)**

**3.05 Substrate Primer - Application and Curing (cont'd) General: (cont'd)**

**3. CONSTRUCTION DETAILS: (cont'd)**

**3.03 Application and Curing of the Primer: (cont'd)**

**G. Primer Cure (cont'd)**

From the time the PAR1 primer coat is applied at a location, the applied PAR1 Primer coat may require [30 minutes to (60 minutes or more)] to cure, see Section 2.07 of this specification.

H. Additional Primer Bond Testing General primer to substrate bond was verified by testing performed per "Section 3.02.L Substrate Preparation Testing" of this specification.

2. After the primer has cured and prior to the application of the waterproofing membrane; to determine the adequacy of surface preparation and the compatibility of the primer with in specific areas of existing substrate repair materials, additional Tensile Bond Strength "pull-off" (adhesion) Tests may be required to be performed by the Applicator as when recommended by the Stirling Lloyd/Manufacturer's Representative; and as directed approved by the Engineer.

3. If the additional Tensile Bond Strength "pull-off" (adhesion) Test results meet this specification's requirements, the substrate exposed subsequently by the "pull-off" tests must be repaired with PAR1 Primer, or MR6 Primer for steel the appropriate Substrate Primer, then allowed to cure before application of the succeeding waterproofing membrane system component.

4. Should the additional test results indicate adhesion below the specified minimum; the primer must be removed to the limits recommended by the Manufacturer's Representative and approved by the Engineer, and the exposed substrate surface re-prepared and reprimed at no additional cost. Additional Tensile Bond Strength Tests to the repaired area will be conducted when recommended by the Manufacturer's Representative and approved by the Engineer.

Should the additional test results indicate adhesion below the specified minimum; the primer must be removed to the limits recommended by the Stirling Lloyd Products, Inc. Representative and approved by the Engineer, and the exposed substrate surface re-prepared and reprimed at no additional cost. Additional Tensile Bond Strength Tests will then be conducted as recommended by the Stirling Lloyd representative and approved by the Engineer.

5. 'PAR1 Substrate Primer to substrate' Substrate' adhesion testing will be terminated when the Stirling Lloyd Products, Inc. Manufacturer's Representative recommends and the Engineer accepts approves that the adhesion of the primer Substrate Primer to the substrate within the substrate waterproofing limits detailed in the contract plans meets the requirements of this specification.

I.N. To prevent unnecessary contamination, construction and/or vehicular trafficking of the Substrate Primer, primer once applied should is to be avoided restricted. Restricted trafficking of the Substrate Primer -wherever possible- will be only be allowed as recommended the Manufacturer's Representative and approved by the Engineer. Should rain be anticipated before the Eliminator membrane can be applied; application of primer

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**10.** Primed substrate surfaces determined by the Manufacturer's Representative or the Engineer to be contaminated by dust or dirt shall be re-primed at no additional cost.

~~A. The Eliminator spray-applied waterproofing membrane component shall be applied following the "2 coat" application requirements of the spray-applied waterproofing membrane system employed shall be applied in two coats. The first coat of the membrane is pigmented yellow and the second coat is pigmented gray.~~

B. Temperature Restrictions: The NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed details the Ambient Temperature restrictions and Dew Point Temperature restrictions to be enforced during the application of both the 1<sup>st</sup> and 2<sup>nd</sup> coats of the spray applied waterproofing membrane component.

1. The substrate primer shall be coated with ~~the two~~<sup>2</sup> coats of the spray-applied waterproofing membrane ~~Eliminator membrane~~ in a methodical manner.

a. Each coat (course) of the 2 coat spray-applied waterproofing membrane applied must meet the “Dry” or “Wet and Dry” Film Thickness requirements of the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed. In addition; the measured cumulative 2 coat thickness will be greater than or equal to any total coat thickness requirements of the applicable approved NYSDOT Material Detail Sheets for the spray-applied waterproofing membrane system employed.

**c. Wet Film Thickness Testing**—When required; the wet film thickness of each coat (course) of a spray-applied waterproofing membrane component shall be checked and recorded using a wet film thickness gauge in accordance with ASTM D1212 or D4414. Substrate surfaces with surface textures prohibitive to the use of wet film thickness gauges may be tested with the use of smooth test plates dispersed at test locations and coated at the same time as the substrate. Coated test plates are to be removed, wet film thickness tested and their locations rechecked.

d. **Dry Film Thickness Testing** – When required; the dry film thickness of each coat (course) of a spray-applied waterproofing membrane component shall be checked and recorded using an ultrasonic gauge in accordance with ASTM D6132 or SSPC-PA9. Substrate surfaces with surface textures prohibitive to the use of dry film thickness tests may be tested with the use of smooth test plates dispersed at test locations and coated at the same time as the substrate. Coated

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**ITEM 595.98209830--25 - ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING**

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**3. CONSTRUCTION DETAILS: (cont'd)**

**3.06.C Spray-Applied Waterproofing Membrane - Application and Curing : (cont'd)General: (cont'd)**

test plates are to be removed and their locations recoated. Coated test plates are allowed to cure and are then tested.

- e. Alternatively, the thickness of one or both coats of the spray-applied waterproofing membrane component(s) may be checked by removing and measuring the dry film thickness of a small area of membrane in accordance with ASTM D1005. Areas damaged by thickness testing are to be repaired as recommended by the Manufacturer's Representative and approved by the Engineer.

3. Coverage Rates:

- a. For reference; nominal coverage rates for spray-applied waterproofing membrane components applied to smooth surfaces are given in the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed. Actual coverage rates for membrane components vary dependent on the surface texture of the substrate they are applied to.
- b. Based on an inspection of the surface texture of the substrate to be coated the Manufacturer's Representative will estimate a "Membrane Component Maximum Allowed Coverage Rate" that will achieve the minimum coat film thickness requirements for each coat of an applied component.
- c. The Manufacturer's Representative's estimated "Membrane Component Maximum Allowed Coverage Rate" will not be exceeded by the Applicator, unless a "Membrane Component Maximum Allowed Coverage Rate" change is recommended by the Manufacturer's Representative and approved by the Engineer.

4. Day Joints/Lapping – Where new membrane component material is to be applied to cured in-place/existing cured membrane component material; the lapping/day joint requirements for spray-applied waterproofing membrane component will be adhered to as detailed in the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed.

5. Membrane Component Curing - Each coat of membrane component has cured when the membrane material has set full depth and its surface becomes tack free to the touch.

6. The Applicator shall use masking tape, protection boards or other approved means to control overspray and provide a neat finish.

7. Spraying should be continuous to introduce fresh membrane materials to the pump and lines. In the event of delays; flush the spray lines, guns and mixing block through with solvent approved the by Manufacturer's Representative; storing the flushed material in a suitable drum with a closable top for proper disposal by the Applicator in strict accordance with the local and New York State regulations.

D. 1<sup>st</sup> Waterproofing Membrane Coat Application:

1. Per the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed; all Substrate Primer Overcoating (Overspraying) restrictions are to be followed.

2. Substrate Primer Surface Conditions - Prior to the application of the 1st coat of the spray-applied waterproofing membrane; the Substrate Primer shall be fully cured.

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**3.06.C.3.c Spray-Applied Waterproofing Membrane - Application and Curing : (cont'd)General:**  
(cont'd)

**3.06.C.E.4 Spray-Applied Waterproofing Membrane - Application and Curing : (cont'd) General:**  
(cont'd)

### E. 2<sup>nd</sup> Waterproofing Membrane Coat Application:

1. Per the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed; all 1<sup>st</sup> Coat Membrane Component Overcoating (Overspraying) restrictions are to be followed.
2. Prior to the application of the 2<sup>nd</sup> coat; the cured surface of the 1<sup>st</sup> coat of applied membrane shall be visually inspected by the Contractor, the Manufacturer's Representative, the Applicator and the Engineer. If any defects are found; the 1<sup>st</sup> coat defect(s) identified shall be repaired by the Applicator as recommended by the Manufacturer's Representative and approved by the Engineer. All repairs of defects must be fully cured before the 2<sup>nd</sup> coat of membrane component is applied.
3. Immediately prior to the application of the 2<sup>nd</sup> coat of the spray-applied waterproofing membrane, the surface of the 1<sup>st</sup> coat of waterproofing membrane applied shall be fully cured, clean and free from dust and loose debris, and free from moisture in any form. Any remaining dust or loose particles shall be removed by air blowing or vacuum methods.
4. Broadcast Aggregate Sequencing – A Broadcast Aggregate coating is required. The sequencing of the application of the broadcast aggregate is dependent on the spray-applied waterproofing membrane system employed. Before the 2<sup>nd</sup> coat of waterproofing membrane is applied, review the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed to prepare for the proper sequenced application of Broadcast Aggregate.
5. Follow all "3.03.C General Application Requirements".
6. Membrane Pin Hole "Holiday" Testing – As the curing of the 2nd coat of Spray-applied waterproofing membrane is completed; the Applicator will test the entire limits of the two coat Spray-applied waterproofing membrane for "holidays"/discontinuities (i.e.: pinholes, porosity or flaws ) in the membrane using non-destructive holiday detection equipment in accordance with ASTM D4787. When recommended by the Manufacturer's Representative and approved by the Engineer; identified discontinuities will be delineated, their location recorded and repaired by the Applicator with the application of an additional coating of spray-applied waterproofing membrane within those areas. Repaired areas will be retested.
7. Visual Inspection: Following the application of the 2nd coat; the cured surface of the 2nd coat shall be visually inspected for defects by the Contractor, the Manufacturer's Representative, the Applicator and the Engineer. If defects are found by visual

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**ITEM 595.98209830--25 - ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING**

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inspection; the 2nd coat defect(s) identified shall be repaired by the Applicator as recommended by the Manufacturer's Representative and approved by the Engineer.

B. Each coat of the membrane must be applied to give a measured wet film thickness of {60 mils} on a smooth surface.

C. For each coat, a minimum dry film thickness of {50 mils} on any peaks, rises and irregularities in the deck is required. A minimum dry film thickness can be achieved by a coverage rate of {26.8 SF./Gal.} on a smooth surface. The achievable coverage rate per gallon will decrease with surface irregularity.

D. Spray application may proceed while substrate temperatures are between {14° F to 104° F} providing the substrate temperature is at least 5 degrees above the dew point.

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~~3. CONSTRUCTION DETAILS: (cont'd)~~

G. Repair of Tensile Bond Strength Test Locations T\_\_\_\_\_ If the Tensile Bond Strength “pull off” (adhesion) Test results meet this specification’s requirements, the

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**ITEM 595.98209830--25 - ~~ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING~~**

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substrate exposed ~~subsequently~~ by the Tensile Bond Strength ('pull-off')/adhesion Tests ~~"pull-off" tests~~ must be properly repaired, with each component of the waterproofing system previously applied before the test. Each component of the repair shall be allowed to cure before application of the succeeding waterproofing membrane system component.

- H. ~~Tensile Bond Strength Test Failures - Should the test results indicate adhesion below the specified minimum; the waterproofing membrane system components applied within areas of inadequate adhesion are to be removed to the limits recommend by the Manufacturer's Representative and approved by the Engineer, and the exposed surface repaired at no additional cost. Additional Tensile Bond Strength Tests will then be conducted within repaired areas when recommended by the Manufacturer's Representative and approved by the Engineer.~~

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### ~~3.04 Application and Curing of the Eliminator Bridge Deck Waterproofing Membrane: (cont'd)~~

Should the test results indicate adhesion below the specified minimum, the waterproofing membrane system components applied within areas of inadequate adhesion are to be removed to the limits recommend by the Stirling Lloyd Products, Inc. Representative and approved by the Engineer, and the exposed surface repaired at no additional cost. Additional Tensile Bond Strength Tests will then be conducted within repaired areas as recommended by the Stirling Lloyd Products, Inc. Representative and approved by the Engineer.

System to ~~substrate-Substrate~~ Tensile ~~bond-Bond~~ Strength Testing will be terminated when the ~~Sirling Lloyd Products, Inc.-Manufacturer's~~ Representative ~~recommends~~ and the Engineer approves ~~that~~ adequate adhesion of the waterproofing system to the substrate ~~has been achieved~~ within the substrate waterproofing limits detailed in the contract plans.

B. The sequencing of the application of the broadcast aggregate is dependent on the spray-applied waterproofing membrane system employed. Before the 2nd coat of waterproofing membrane is applied, review the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed to prepare for the proper sequenced application of Broadcast Aggregate.

D. Broadcast Aggregate is to be spread uniformly to a nominal placement rate of [0.75 LB/SF] to achieve an [80% to 90%] saturation of the coated surface or as recommended by the Manufacturer's Representative and approved by the Engineer.

–The

**B-Tack Coat SA1030 shall be supplied to site in the manufacturer's unopened packaging. Packaging comprises a cardboard box containing two blocks of solid tack coat, each in plastic liners. The cardboard must be discarded prior to depositing the blocks into the heating kettle. The plastic liners may be deposited into the heating kettle with the tack coat.**

**C.Tack Coat SA1030 should be stored in cool, dry conditions, out of direct sunlight and in accordance with the relevant Health & Safety Regulations. Storage at elevated temperatures may cause deformation of the cardboard packaging. This should have no detrimental effect on the performance of the material unless the cardboard cannot be properly removed.**

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### 3. CONSTRUCTION DETAILS: (cont'd)

### 3.07 Broadcast Aggregate - Application: (cont'd)

~~4-F. Tack Coat Curing -- The final coat of a Tack Coat System. The SA1030 Tack Coat shall be considered cured when it has cooled to a temperature at which the placement and compaction of hot mix asphalt atop it can begin without damaging the Tack Coat System SA1030 tack coat or the Eliminator Bridge Deck Waterproofing System spray-applied waterproofing membrane components beneath it. The Tack Coat System SA1030 tack coat must cool to the ambient temperature of the deck before paving can commence, unless otherwise recommended by the Stirling Lloyd Products, Inc. Manufacturer's Representative and accepted approved by the Engineer.~~

~~3. CONSTRUCTION DETAILS: (cont'd)~~

### ~~3.05 Application and Curing of the Tack Coat SA1030: (cont'd)~~

## ~~I. Taek Coat Curing~~

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**ITEM 595.98209830--25 - ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING**

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From the time a coat of SA1030 Tack Coat is applied at a location, the applied SA1030 Tack Coat may require [45 minutes to (60 minutes or more)] to cure, see Section 2.07 of this specification.

G. J. The tack coat will accept foot traffic and vehicular traffic with rubber tires once it is dry on the Tack Coat System will be restricted as recommended by the Manufacturer's Representative and approved by the Engineer. However, to prevent unnecessary contamination vehicular traffic should be avoided.

**3.063.09 Multiple Zone Application of the Eliminator Bridge Deck Waterproofing Spray-applied Waterproofing Membrane System:**

When the Eliminator Bridge Deck Waterproofing System spray-applied waterproofing membrane system employed is installed sequentially in separate, but contiguous, zones of a bridge deck; the edge of each component layer of the last zone installed must be left exposed a minimum of (2-inches) per the Manufacturer's recommendations along its contiguous border with each adjacent zone of a bridge deck not yet waterproofed.

As succeeding bridge deck zones are waterproofed, each component installed in that succeeding zone is to be lapped per the Manufacturer's recommendations a minimum of (2-inches) to the same component placed as part of the installation of the previously installed adjacent and contiguous Eliminator Bridge Deck Waterproofing System zones spray-applied waterproofing membrane component.

**3.073.10 Repair of Damaged Membrane by the Applicator:**

A. At all locations; the damaged surface of any single component of the spray-applied waterproofing membrane system must be repaired prior to initiating the application of the next component of the system as recommended by the Manufacturer's Representative's and approved by the Engineer.

A. Cut back a damaged area to a perimeter with sound and undamaged waterproofing membrane system material adequately bonded to the substrate.

B. First scrape or abrade off the SA1030 Tack Coat within the cut back area and a minimum of (2-inches) beyond the perimeter of the cut back area, then solvent wipe the revealed (2-inch) minimum perimeter of the exposed Eliminator membrane component with acetone to remove all residual tack coat.

C. If the primer has been damaged or removed within the cut back area, properly re-prime the substrate using PAR1 Primer for Concrete or the MR6 Primer for Steel.

D. Apply Eliminator waterproofing membrane material to the damaged area ensuring that a continuous membrane with at least the required minimum thickness is obtained across the cut back repair area. Overlap the repair by a minimum of (2-inches) with the revealed existing membrane.

E. Once the membrane has cured, re-apply the tack coat onto the repaired area as required.

F. B. Additional Tensile Bond Strength "pull-off" (adhesion) Tests of repaired areas may be required to be performed by the Applicator as when recommended by the Stirling Lloyd Manufacturer's Representative, and as directed approved by the Engineer.

**3.083.11 Hot Rolled Asphalt Surfacing:**

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**3. CONSTRUCTION DETAILS:** (cont'd)

**3.10 Repair of Damaged Membrane by the Applicator:** (cont'd)**General:** (cont'd)

- A. The installation of hot mixed asphalt atop the cured Tack Coat System must be done in accordance with the NYSDOT approved Material Detail Sheets for the spray-applied waterproofing membrane system employed.
- B. The applied tack coat Tack Coat shall System shall be dry-cured and be contaminant free prior to the application of the a hot rolled asphalt (HMA) overlay.
- B. Surfacing can take place when the Tack Coat SA1030

**3. CONSTRUCTION DETAILS:** (cont'd)

**3.08 Hot Rolled Asphalt Surfacing:** (cont'd)

- A-C. The finished rolling temperature of the surfacing shall exceed both the activation temperature of [190°F] for Tack Coat SA1030 Tack Coat System employed and the minimum HMA rolling temperature permitted.
- B-D. The Manufacturer's maximum permissible surfacing temperature for hot mix asphalt application onto the Eliminator Bridge Deck Waterproofing System is [480°F] spray-applied waterproofing membrane system employed will not be exceeded.
- C-E. The mechanical action of asphalt pavers should be kept to a minimum. Wherever possible use pneumatic/balloon-tired vehicles. Tracked vehicles are more prone to causing pick-up of tack coat and so should only be used with extra care. Paver tires or tracks should be cleaned and sprayed regularly with a detergent solution [(washing-up liquid: water) at nominally 1:16, i.e. (one washing-up liquid to two gallons water)] before driving onto the tack coat and during paving as necessary. Spraying of the tires or tracks should continue during paving as necessary.
- D-F. Delivery vehicle tires should be inspected, cleaned and sprayed with a detergent solution [(washing-up liquid: water) at nominally 1:16, i.e. (one washing-up liquid to two gallons water)] before driving onto the tack coat and during paving as necessary. Spraying of the tires should continue as necessary during paving.
- E-G. Stationary vehicles on the Tack Coat SA1030 Tack Coat System should be avoided. If operations are suspended or delayed all vehicles should be removed or isolated from the SA1030 Tack Coat System by boards.

**3.093.12 Quality Control Documentation:** The Applicator shall supply the Contractor and the Engineer with the following:

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**3.12.B.2 Quality Control Documentation: (cont'd) General: (cont'd)**

1. A letter of certification shall be issued by Stirling Lloyd Products, Inc the Manufacturer for each delivery of waterproofing system materials to the construction site.

- ~~2. A copy of the Stirling Lloyd Products, Inc. “Eliminator – Bridge Deck Waterproofing: Standard Field Process Quality Control Plan”.~~

1. **Adhesion Tests** - The locations and results of Tensile Bond Strength ("Pull-off") Adhesion Tests performed by the Applicator at each step of the application of the waterproofing system per "Section 3.01-N03" of this specification are to be documented using the Stirling Lloyd Products, Inc. "QA & Materials Record" form by the Applicator and submitted to the Stirling Lloyd Products, Inc. Manufacturer's Representative and the Engineer.

- ~~3. CONSTRUCTION DETAILS: (cont'd)~~

### ~~3.09~~ Quality Control: (cont'd)

~~C. On-site: (cont'd)~~

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**ITEM 595.98209830--25 - ELIMINATOR SPRAY-APPLIED BRIDGE DECK WATERPROOFING**

**MEMBRANE SYSTEM** 05/26/2013 11:19 PM05/26/201305/26/2013 11:19 PM05/26/201305/26/2013 11:19 PM05/26/201312/29/2019 2:49 PM

specification. A map locating areas where holiday detection testing indicated discontinuities shall be provided.

**6.Samples** — When deemed necessary by the Engineer; for any individual component of the ~~Eliminator Bridge Deck Waterproofing System~~ spray-applied waterproofing membrane system being applied, coating samples of a minimum size [8 in. x 8 in.] shall be provided for every [500,2000 SF.] of the component being applied.

~~7.6. The requirements of this specification shall be verified during the course of the project via comparison with the sample properties.~~

**4. METHOD OF MEASUREMENT:**

**4.01** The quantity to be paid for under this item will be measured as the number of square feet of bridge deck substrate in-place that are coated with the spray-applied waterproofing membrane system installed in accordance with this specification within the limits detailed in the Contract Plans and approved by the Engineer.

**4.02** For all spray-applied waterproofing membrane system components; no additional payment will be made for the area of spray-applied waterproofing membrane component applied to create a required lap between two areas of that membrane component placed at different times; including all laps made during the application process, laps required at locations where a repair to the membrane system is required, or laps required as "day joints" between succeeding periods of installation or between succeeding stages of construction.

**4.03** For all spray-applied waterproofing membrane system components; no additional payment will be made for the area of spray-applied waterproofing membrane component applied to carry the membrane component vertically up a curb or barrier surface to an elevation a neat line 1 inch higher than the detailed completed asphalt overlay thickness at the curb or barrier face.

~~4.01 The quantity to be paid for under this item will be measured as the number of square feet of bridge deck substrate in-place that are coated with the Eliminator Bridge Deck Waterproofing System in accordance with this specification and accepted by the Engineer.~~

**5. BASIS OF PAYMENT:**

**5.01** The ~~spray-applied waterproofing membrane system installed~~ Eliminator Bridge deck Waterproofing System will be paid for at the contract unit price bid per square foot; which price shall be full compensation for substrate preparation, for furnishing and applying the ~~PAR+~~ Substrate Primer, for furnishing and applying the ~~two 2~~ coat spray-applied waterproofing membrane, for furnishing and applying the ~~SA1030 tack coat~~ Tack Coat System, and for performing and documenting all testing detailed within this specification.

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