ITEM 595.9820--25 - ELIMINATOR BRIDGE DECK WATERPROOFING SYSTEM

1. DESCRIPTION:

1.01 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. MATERIALS:

2.01 The spray applied waterproofing membrane system to be furnished and applied shall be the Eliminator Bridge Deck Waterproofing System manufactured by:

Stirling Lloyd Products, Inc.
152 Rockwell Road, Building 'A'
Newington, CT 06111
[redacted]

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 The membrane system; including the PAR1 Primer (or MR6 Primer), the two coat Eliminator membrane and the SA1030 Tack Coat components; shall be applied to the prepared substrate surfaces by an Applicator licensed by the Stirling Lloyd Products, Inc.

2.04 All material components shall be supplied to the job site in Stirling Lloyd Products' unopened packaging; and shall be clearly identified with the product name, date of manufacture and batch number.

2.05 All material components of the system shall be stored in cool, dry conditions out of the direct sunlight and in accordance with their Material Safety Data Sheets (MSDS) and all relevant Health and Safety regulations. Storage temperatures must not exceed 90 F (32 C). Do not store metal containers on any completed sections of the Eliminator system as rust rings may be deposited in the event of rain.

2.06 Copies of Stirling Lloyd Products' Material Safety Data Sheets (MSDS) for all materials shall be kept on site for review by the Engineer or other NYSTA personnel.

2.07 Each component of the waterproofing system must reach a cured condition before it can be overcoated with the succeeding component of the waterproofing system; and in the case of the tack coat component, it must reach a cured condition before it can be overlayed with asphalt pavement. 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. C~~c~~ritical ~~overcoating~~ time curing period estimates for each component to reach a cured condition~~s for all components~~ shall be provided by Stirling Lloyd Products, Inc., along with a curing ladder for that component~~s~~.

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ITEM 595.9820--25 - ELIMINATOR BRIDGE DECK WATERPROOFING SYSTEM

2. MATERIALS: (cont'd)

2.08 The applied and cured waterproofing membrane system shall be capable of carrying the direct load of rubber-tired equipment or vehicles when the "Surfacing" guidance of Stirling Lloyd Products' "Eliminator – Bridge Deck Waterproofing: Standard Field Process Quality Control Plan" is adhered to.

2.09 Miscellaneous steel substrates, should they be encountered, must be primed using Stirling Lloyd Products, Inc. MR6 Primer following Stirling Lloyd Products, Inc. recommended steel substrate preparation procedures, and MR6 Primer application procedures.

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

2.11 Wire Mesh, where required at bridge deck weep tubes, shall be a (¼-inch) Mesh 22 Gauge (0.028") Galvanized Hardware Cloth.

3. CONSTRUCTION DETAILS:

3.01 **General**:

A. For the duration of the contract and at no additional cost; Stirling Lloyd Products, Inc will employee a company Representative that shall oversee the furnishing and installation of the Eliminator Bridge Deck Waterproofing System. The Representative will provide installation guidance and recommendations for, and will perform quality assurance inspections of, the Eliminator Bridge Deck Waterproofing System being installed.

~~A.~~B. A Stirling Lloyd Products, Inc. Representative shall be present during the ~~construction~~ furnishing and installation of the Eliminator Bridge Deck Waterproofing System.

C. A Stirling Lloyd Products, Inc. Representative shall be present during the construction of any asphalt pavement course placed directly in contact with the Eliminator Bridge Deck Waterproofing System.

D. Each component of the Eliminator Bridge Deck Waterproofing System will be furnished through and installed by an Applicator licensed by Stirling Lloyd Products, Inc. A licensed Applicator is a Subcontractor employed directly by the Contractor that is trained and certified by Stirling Lloyd Products, Inc. to be capable of installing an Eliminator Bridge Deck Waterproofing Membrane System. A list of competing regional Applicators licensed by Stirling Lloyd Products, Inc. is available from Stirling Lloyd Products, Inc.

E. The Applicator shall submit proof of having the skill and experience necessary to construct the Eliminator Bridge Deck Waterproofing System detailed in this specification and the contract plans.

F. The following work required to construct an Eliminator Bridge Deck Waterproofing System shall be completed by an Applicator licensed by Stirling Lloyd Products, Inc.:

1. Substrate Preparation.
2. Application and Curing of the PAR1 Primer (or MR6 Primer).
3. Application and Curing of the 2 coat Eliminator Bridge Deck Waterproofing Membrane.

~~1.~~4. Application and Curing of the Tack Coat SA1030.

G. The Eliminator Bridge Deck Waterproofing System (including the PAR1 primer (or MR6 Primer), two coat Eliminator membrane and SA1030 Tack Coat) shall be applied to the prepared concrete surfaces strictly in accordance with the requirements of this specification, or in accordance with the requirements of the Stirling Lloyd Products, Inc. "Eliminator Bride Deck Waterproofing: Standard Field Process Quality Control Plan" when directed by the Engineer.

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ITEM 595.9820--25 - ELIMINATOR BRIDGE DECK WATERPROOFING SYSTEM

3. CONSTRUCTION DETAILS: (cont'd)

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

~~B.A Stirling Lloyd Products, Inc. Representative shall be present during the construction of any asphalt pavement course placed directly in contact with the Eliminator Bridge Deck Waterproofing System.~~

~~C.Stirling Lloyd Products, Inc. licenses Applicators that are trained and certified to be capable of constructing an Eliminator Bridge Deck Waterproofing Membrane System. A list of competing regional Applicators licensed by Stirling Lloyd Products, Inc. is available from Stirling Lloyd Products, Inc.~~

~~F.The Stirling Lloyd Products, Inc. Representative and the Applicator are two different personnel, with the Representative performing quality assurance inspections of the Applicator's work.~~

H. All construction, Applicator and Stirling Lloyd personnel in close proximity to the application shall observe all safety precautions in accordance with the products MSDS

~~H.~~I. A one pint sample of each component of the Eliminator Bridge Deck Waterproofing System shall be retained by the Engineer for informational testing.

~~I.~~J. Immediately prior to the application of any component of the waterproofing system, the deck shall be dry and any remaining dust or loose particles shall be removed by air blowing or vacuum methods

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

~~K.~~L. Where applicable on vertical curb, concrete barrier and header surfaces; each component of the Eliminator Bridge Deck Waterproofing System shall be applied and finished off in a neat line 1 inch higher than the completed asphalt overlay.

~~L.~~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 3 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.

N. **Tensile Bond Strength Tests:**

1. Tensile Bond Strength Tests will be performed by the Applicator to confirm the adhesion of the Stirling Lloyd Products, Inc. PAR1 primer to the substrate and/or to confirm the adhesion between two or more components of the Eliminator Bridge Deck Waterproofing System to the substrate.
2. Each Tensile Bond Strength Test will be executed in accordance to ASTM D4541.
3. Test spots shall: (i) be PAR1 Primed and cured, (ii) be coated with a small amount of the Eliminator membrane component, (iii) have a test loading fixture/"dolly" (per ASTM D4541) gently pressed into the membrane component without extruding the membrane component outside of the dolly area, and (iv) allow the membrane component to cure before the ASTM D4541 test is performed. A thickness of at least 40 mils of membrane component will be achieved between the PAR1 primed surface and the dolly.
4. At Tensile Bond Strength Test locations; the Eliminator membrane material coating to which the test loading fixture is seated may require [30 minutes to (60 minutes or more)] to cure prior to performing the test, see Section 2.07 of this specification.
5. Minimum Tensile Bond Strength "pull-off" (adhesion) Test values shall be greater than or equal to 100 psi for a concrete substrate (with failure occurring in the concrete exposing aggregate), and greater than 290 psi for a steel substrate.

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

3. CONSTRUCTION DETAILS: (cont'd)

3.02 **Substrate Preparation**:

A. **Preparatory Site Inspection To Be Performed By The Representative 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 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 surfaces will be incapable of developing a Tensile Bond Test strength "pull-off" (adhesion) test value greater than or equal to 100 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 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 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 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 PAR1 Primer to an existing concrete repair's surface. Suspected areas of incompatible concrete repairs will be Tensile Bond Tested by the Applicator.

B. Prior to the execution of the work performed under this specification; the repair of the existing concrete bridge deck will be completed, with unsound concrete substrate surfaces identified, removed and repaired by work performed under other contract pay items by the Contractor.

C. 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 PAR1 Primer to the existing substrate surfaces.

D. Prior to the application of the PAR1 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. Prior to the application of the PAR1 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 Test strength "pull-off" (adhesion) test value greater than or equal to 100 psi can be achieved (with failure occurring in the concrete exposing aggregate).

3. CONSTRUCTION DETAILS: (cont'd)

3.02 **Substrate Preparation**: (cont'd)

F. **Deck Sounding by Applicator** - Prior to the application of the PAR1 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, 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 primer and the concrete substrate.

All unsound substrate surface material revealed by the Applicator is to be removed and repaired by the Applicator prior to placement of the PAR1 Primer coat. Spans and areas where unsound substrate surface material is removed shall be repaired with a mortar/concrete compatible with the Eliminator Bridge Deck Waterproofing System. The Stirling Lloyd Products, Inc. Representative shall determine the necessity and adequacy of the repairs.

G. **Surface Texture** - Prior to the application of the PAR1 Primer; substrate irregularities must be prepared.

Surface features having sharp external edges or internal angles are to be made level by the Applicator by grinding; leaving a peak to valley surface texture not to exceed ¼ inch, unless otherwise recommended by the Stirling Lloyd Products, Inc. Representative and accepted by the Engineer.

Additionally, areas of minor surface deterioration of l/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 Eliminator Bridge Deck Waterproofing System. The extent and locations of thin surface patches to be made requires the approval of the Stirling Lloyd Products, Inc. Representative before the waterproofing membrane system is applied.

H. **Deck Crack Inspection and Repair** - Prior to priming of the substrate surface, the Engineer and the Applicator shall inspect the deck for cracks.

1. Static cracks less than 0.02 inches may be oversprayed by the Applicator without pretreatment.
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. 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.

      The resulting debris shall be removed using clean, dry, oil-free compressed air or an industrial vacuum.
   b. The crack shall be filled with a rapid-set cement mortar that meets the approval of the Stirling Lloyd Products, Inc Representative and the Engineer. The mortar shall be troweled into place, completely filling the routed areas and leveling those areas with the substrate.
3. Cracks wider than 0.02 inches that are moving due to temperature and/or loading shall be inspected by the Stirling Lloyd Products, Inc. Representative and the Engineer. The Engineer will determine the method of treatment for non-static structural cracks. Non-static structural cracks determined by the Engineer to require repair, will be repaired and paid for under other contract items prior to installing the PAR1 Primer.
4. Construction joints in the deck slab shall be treated as recommended by the Stirling Lloyd Products, Inc. Representative's and approved by the Engineer.

3. CONSTRUCTION DETAILS: (cont'd)

3.02 **Substrate Preparation**: (cont'd)

I. 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, shall be cleaned by the Applicator in accordance with ASTM D4259 to remove all fines, laitance, curing compounds, etc., from the surface, exposing aggregate not to exceed 1/4 inch peak to valley surface texture to assure an excellent bond of the PAR1 Primer to substrate.

Concrete surfaces shall be cleaned by the Applicator with automatic shot-blasting units or as recommended by the Stirling Lloyd Products Inc. Representative. For those areas not accessible to this machinery, the surface shall be cleaned with abrasive blast cleaning equipment.

Automated shot-blast units shall use steel shot, be self propelled and include a vacuum to recover spent abrasives.

Magnetic rollers or other devices shall be used to remove any spent shot remaining on the deck after vacuuming.

J. At the time of the application of the PAR1 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.

K. There shall be no visible moisture present on the surface of the concrete at the time of application of the PAR1 Primer coat. Compressed oil-free air and/or a light passing of a propane torch may be used to dry the surface of the deck.

L. **Substrate Preparation Testing:**

1. **Tensile Bond Strength Testing** - After substrate preparation and prior to the PAR1 Primer application; the substrate must be tested by the Applicator for Tensile Bond Strength in accordance to ASTM D4541. See "Section 3.01.N" for test details and "pull-off" requirements.

   A minimum of two Tensile Bond Strength tests will be required for each continuous substrate area less than or equal to [500SF.] to which PAR1 Primer is applied.

   For continuous substrate areas exceeding [500 SF.]; a minimum of two Tensile Bond Strength Tests will be required for the first [500 SF.] of that substrate area, with one additional test required for every additional prepared substrate area equal to or less than [500 SF.] containable within the continuous substrate area.

   Within each continuous area of prepared substrate; additional Tensile Bond Strength Tests may required at locations recommended by the Stirling Lloyd Products, Inc. Representative and accepted by the Engineer.

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

2. **Surface Moisture Testing** - Immediately preceding the application of the PAR1 Primer; all concrete surfaces must have a maximum surface moisture content of 5% as determined by the Applicator with a moisture meter acceptable to and approved by the Stirling Lloyd Products, Inc. Representative and the Engineer.

   A minimum of two Surface Moisture Content tests will be required for each continuous substrate area less than or equal to [500 SF.] to which PAR1 Primer is applied.

3. CONSTRUCTION DETAILS: (cont'd)

3.02 **Substrate Preparation**: (cont'd)

L. **Substrate Preparation Testing:** (cont'd)

For continuous substrate areas exceeding [500 SF.]; a minimum of two Surface Moisture Content tests will be required for the first [500 SF.] of that substrate area, with one additional test required for every additional prepared substrate area equal to or less than [500 SF.] containable within the continuous substrate area. .

Within each continuous area of prepared substrate; additional Surface Moisture Content tests may required at locations recommended by the Stirling Lloyd Products, Inc. Representative and accepted by the Engineer.

The exact locations of Surface Moisture Content tests will be recommended by the Stirling Lloyd Products, Inc. Representative and approved by the Engineer.

3.03 **Application and Curing of the Primer**:

A. The existing substrate material being coated shall be compatible with the applied primer. Concrete substrates must be primed using Stirling Lloyd products, Inc PAR1 Primer. Miscellaneous steel substrates, should they be encountered, must be primed using Stirling Lloyd Products, Inc. MR6 Primer.

For substrates other than concrete and steel, the Engineer shall determine the appropriate primer type based on Stirling Lloyd Products, Inc. recommendations.

B. The coverage rate of the primer application shall be monitored by checking the volume of material used against the area covered.

The PAR1 Primer may be roller-applied or spray-applied at a coverage rate of between [125-175 SF./Gal.], depending on the porosity of the concrete substrate. MR9 Primer applied to miscellaneous steel can be roller or spray applied at a coverage rate of between [125-175 SF./Gal.].

One application is normally sufficient, and the correctly applied material will cure with a visible surface sheen. Should a visible sheen not be present at the completion of the curing of the appropriate primer, the primer may have been absorbed by higher concrete porosity or else may have been under-applied, and must be overcoated with the appropriate primer to provide a visible sheen.

C. Application may proceed provided the substrate temperature is at least 5 F above the dew point. Hardener powder is mixed into the PAR1 Primer prior to application at the dosage specified in the Stirling Lloyd Products, Inc. Mixing Guide.

D. The substrate shall be coated in a methodical manner.

E. Ponding/puddling of the primer must be avoided. Should ponding/puddling occur, the surplus primer must be removed or evenly dispersed by brush or roller.

F. All weather and primer consumption data is to be recorded on a standard Stirling Lloyd Products, Inc. "QA & Materials Record" form.

G. **Primer Cure** - The primer shall cure tack free and with a visible sheen before application of the waterproofing membrane. The Stirling Lloyd Products, Inc. Representative shall recommend when the primer cure is adequate to install the next component of the waterproofing system. The installation of the next component can continue with the Engineer's acceptance of the Representative's recommendation.

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.

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 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 recommended by the Stirling Lloyd Representative, and as directed by the Engineer.

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, then allowed to cure before application of the succeeding waterproofing membrane system component.

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.

'PAR1 Primer to substrate' adhesion testing will be terminated when the Stirling Lloyd Products, Inc. Representative recommends and the Engineer accepts the adhesion of the primer to the substrate within the substrate waterproofing limits detailed in the contract plans.

I. To prevent unnecessary contamination, vehicular trafficking of the primer once applied should be avoided wherever possible. Should rain be anticipated before the Eliminator membrane can be applied; application of primer to as large an area as possible, (before the rain while remaining within this specification's requirements) will facilitate faster subsequent drying-out of the deck.

J. Primed surfaces determined by the Representative or the Engineer to be contaminated by dust or dirt shall be re-primed at no additional cost.

3.04 **Application and Curing of the Eliminator Bridge Deck Waterproofing Membrane**:

A. The Eliminator membrane shall be applied in two coats. The first coat of the membrane is pigmented yellow and the second coat is pigmented gray.

The primer shall be coated with the two coats of the Eliminator membrane in a methodical manner.

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, arises 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.

3. CONSTRUCTION DETAILS: (cont'd)

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

E. Spraying should be continuous to introduce fresh 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 Stirling Lloyd Products, Inc. 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.

F. **Wet Film Thickness Testing** -The wet film thickness of each coat of the Eliminator membrane component applied shall be checked and recorded at least once every [100 SF.] 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 removed, wet film thickness tested and their locations recoated. Alternatively, the thickness of one or both coats of the Eliminator membrane component(s) may be checked by removing and measuring a small area of gelled membrane.

G. **Eliminator Membrane Cure** – Each coat of the Eliminator membrane has cured when the membrane material has set full depth and its surface becomes tack free to the touch.

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

H. Each Eliminator membrane coat shall be visually inspected by the Stirling Lloyd Products, Inc. Representative and the Engineer prior to the application of the next coat.

I. **Overcoating** - There is an unlimited overcoating time (i.e. no maximum) of the Eliminator waterproofing membrane onto the primer (and primer to primer, and Eliminator to Eliminator), however overcoating of the primer should take place as soon as possible following its application to avoid unnecessary surface contamination.

J. **Eliminator "Holiday" Testing** – As the curing of the second coat of Eliminator membrane is completed; the Applicator will test the entire limits of the two coat Eliminator membrane for "holidays"/discontinuities (i.e.: pinholes, porosity or flaws) in the membrane using non-destructive holiday detection equipment in accordance with ASTM D4787. As recommended by the Stirling Lloyd Products, Inc. Representative and accepted by the Engineer; identified discontinuities will be delineated, their location recorded and repaired by the Applicator with the application of an additional coating of Eliminator membrane within those areas. Repaired areas will be retested.

K. **Additional Eliminator Membrane Bond Testing** - After the first and/or second coat of the waterproofing membrane has cured; to determine the adequacy of the adhesion of the applied waterproofing system components to the substrate and each other, additional Tensile Bond Strength "pull-off" (adhesion) Tests may be required to be performed by the Applicator as recommended by the Stirling Lloyd Representative and as directed by the Engineer .

If the Tensile Bond Strength "pull-off" (adhesion) Test results meet this specification's requirements, the substrate exposed subsequently by the "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.

Comment [B1]: Construction has asked to identify the type of solvents to be used MSDS will be required to be provided for any solvent used Proper disposal is the most important issue to the Engineer

3. CONSTRUCTION DETAILS: (cont'd)

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

K. **Additional Eliminator Membrane Bond Testing** (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.

L. Eliminator Bridge Deck Waterproofing System to substrate Tensile bond Strength Testing will be terminated when the Stirling Lloyd Products, Inc. Representative and the Engineer approve the adequate adhesion of the waterproofing system to the substrate within the substrate waterproofing limits detailed in the contract plans.

3.05 **Application and Curing of the Tack Coat SA1030**:

A. Tack Coat SA1030 is a polymer-modified bitumen product used as a hot melt adhesive.

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.

D. A fire blanket or a lid for the heating vessel shall be available in case the flash point of Tack Coat SA1O3O of [480 F] is exceeded and a fire occurs.

E. The waterproofing membrane shall be allowed to cure until the Stirling Lloyd Products, Inc. Representative recommends, and the Engineer accepts, that the curing of the waterproofing membrane is adequate to allow the SA1030 tack coat to be applied.

F. Tack coat SA1030 shall be applied to the cured waterproofing membrane system in all areas due to receive hot rolled asphalt.

G. Tack Coat SA1030 is heated and melted in a bitumen pot at a temperature between [350 F - 400 F]. Heating above this temperature will degrade the product. It is then applied by squeegee at a coverage rate of approximately [140 SF. per 50 lbs at 40 mils thick].

H. During the application use a straight edge or other means at the day joint or overlap area to keep it free from tack coat by 2inches. This is important in order to prevent any contamination of existing membrane affecting the adhesion of subsequent laps of Eliminator.

I. **Tack Coat Curing** - 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 SA1030 tack coat or the Eliminator Bridge Deck Waterproofing System beneath it. The 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. Representative and accepted by the Engineer.

3. CONSTRUCTION DETAILS: (cont'd)

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

I. **Tack Coat Curing**

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.

J. The tack coat will accept foot traffic and vehicular traffic with rubber tires once it is dry. However, to prevent unnecessary contamination vehicular traffic should be avoided.

3.06 **Multiple Zone Application of the Eliminator Bridge Deck Waterproofing System**:

When the Eliminator Bridge Deck Waterproofing System 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) 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 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 zone.

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

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. Additional Tensile Bond Strength "pull-off" (adhesion) Tests may be required to be performed by the Applicator as recommended by the Stirling Lloyd Representative, and as directed by the Engineer.

3.08 **Hot Rolled Asphalt Surfacing**:

A. The applied tack coat shall be dry and be contaminant free prior to the application of the hot rolled asphalt.

B. Surfacing can take place when the Tack Coat SA1030 has cooled to ambient deck temperature, unless otherwise recommended by the Stirling Lloyd Products, Inc. Representative and accepted by the Engineer; or it can be delayed indefinitely with no detriment to the adhesion strength achieved provided the surface is dry and free from contaminants. Preferably it should be applied without undue delay to prevent unnecessary contamination. If the tack coat should become contaminated with dust or other debris it shall be cleaned as necessary.

3. CONSTRUCTION DETAILS: (cont'd)

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

A. The finished rolling temperature of the surfacing shall exceed both the activation temperature of [190 F] for Tack Coat SA1030 and the minimum rolling temperature permitted.

B. The maximum permissible surfacing temperature for hot mix asphalt application onto the Eliminator Bridge Deck Waterproofing System is [480 F].

C. 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. 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. Stationary vehicles on the Tack Coat SA1030 should be avoided. If operations are suspended or delayed all vehicles should be removed or isolated from the SA1030 by boards.

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

A. **From Stirling Lloyd Products, Inc.** –

1. A letter of certification shall be issued by Stirling Lloyd Products, Inc. for each delivery of waterproofing system materials to the construction site. The first shipment shall include a copy of the Stirling Lloyd Products, Inc quality assurance program, listing all in-house testing criteria.
2. A copy of the Stirling Lloyd Products, Inc. "Eliminator – Bridge Deck Waterproofing: Standard Field Process Quality Control Plan".

B. **On-site**:

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.N" of this specification are to be documented using the Stirling Lloyd Products, Inc "QA & Materials Record" form and submitted to the Stirling Lloyd Products, Inc. Representative and the Engineer.
2. **Temperature Records**- Ambient air temperature, substrate temperature and the dew point shall be recorded at the time of placement of each component of the Eliminator Bridge Deck Waterproofing System. Dew points shall be calculated from the temperature and humidity using standard tables. If the Relative Humidity (RH) is greater than 85% at any time during the installation of any component of the waterproofing system, the Stirling Lloyd Products, Inc. Representative must give written confirmation that application can continue without affecting the performance properties of waterproofing system component being applied.

3. CONSTRUCTION DETAILS: (cont'd)

3.09 **Quality Control**: (cont'd)

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

3. **Membrane Thickness** – The thickness of each coat of the Eliminator membrane component applied shall be checked and recorded at least once every [100 SF.] per Section 3.04.F of this specification.
4. **Coverage Rates** - Coverage rates for each component applied should be monitored and recorded by checking the quantity of material used against the area covered.
5. **Holiday Detection** - The entire surface of the waterproofing membrane system shall be holiday tested by the Applicator as per Section 3.04.J of this 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 being applied, coating samples of a minimum size [8 in. x 8 in.] shall be provided for every [500 SF.] of the component being applied.
7. 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 Eliminator Bridge Deck Waterproofing System in accordance with this specification and accepted by the Engineer.

5. BASIS OF PAYMENT:

5.01 The 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 PAR1 Primer, for furnishing and applying the two coat waterproofing membrane, for furnishing and applying the SA1030 tack coat, and for performing and documenting all testing detailed within this specification.