Detail Sheets for Bridge Deck Membrane™ Waterproofing System as manufactured by Bridge Preservation

Prepared for State of New York Department of Transportation March 1, 2011

I. Surface Preparation

a. Method of Cleaning

Prepare concrete surfaces in accordance to SSPC-SP 13/NACE No 6. Surface Preparation of Concrete, which includes, shot blasting, sand blasting or high-pressure water blasting. Prepare metal surfaces to SSPC-SP10/NACE No. 2 Near-White Blast Cleaning.

b. Level of Cleanliness

The degree of cleanliness is such that no deleterious matter is to be left on the surface including residual curing compound, laitance, oils or other that could prevent bonding to the concrete surface. The concrete's surface profile is not to exceed $\frac{1}{4}$" (6 mm) unless authorized by the Manufacturer's site representative and to minimally be that of very coarse sandpaper having some aggregate exposed and the surface to be open.

In the case of a steel deck, the finish is to be SSPC-SP 10 with a 3 – 5 mil blast profile, and must done such that the steel primer can be applied within 4-6 hours of the surface preparation. The steel surface must be devoid of any mil scale, rust or oil that could prevent proper bonding of the waterproofing system.

c. Bond Strength to Substrate

The acceptability of the surface preparation and integrity of substrate shall be determined by means of applying primer to the prepared deck then attaching a metal dolly to the primed area of deck then pulled according to ASTM D4541. The pull test method and frequency of adhesion tests shall be followed in accordance with ASTM D4541. The pull test will be deemed acceptable if a result of minimum of 150 psi (1 MPa) for concrete and 300 psi (2 MPa) for steel has been achieved.

d. Moisture Content of Concrete

Moisture content of the concrete deck prior to application of concrete primer must be below 5.0% when measured with a Tramex Concrete Moisture Encounter moisture meter or other as approved by Bridge Preservation. Various moisture meters will provide different readings on the same area of concrete and therefore other meters must have been previously been calibrated by the membrane manufacturer.

e. Acetone Wipe down

After surface preparation of steel surfaces to SSPC-SP 10, should there be any contamination of this surface, acetone may be used to clean the affected surface prior to applying the steel primer.

II. Primer Application

a. Storage and Handling

Store material in original unopened factory containers, preferably between 55°F and 95°F (13°-
35°C). Avoid freezing.

b. **Weather Limitations**
   Primer can be applied to substrates at temperatures ranging from -20°F to 180°F (-29°-82°C), and to substrates whose temperatures are 5 degrees above the dew point with the temperature rising.

c. **Moisture content of Substrate**
   Moisture content of the concrete substrate must be below 5.0% when measured with a Tramex Concrete Moisture Encounter moisture meter or other as approved by Bridge Preservation. Various moisture meters will provide different readings on the same area of concrete and therefore other meters must have been previously been calibrated by the membrane manufacturer.

d. **Protection of Traffic, Workers, Environment and Adjacent Features**
   Primer to be applied by squeegee on concrete surfaces therefore eliminating chance of overspray and airborne contaminants. Where surface profile is between 1/8” and ¼” inch (3-6 mm) and when the manufacturer deems it necessary, airless spray as a method of application is acceptable.
   Workers to follow safety instructions indicated in MSDS sheets with respect to respirators and safety equipment.

e. **Application Rate**
   Concrete Primer to be applied between 150 and 200 ft² per gallon (3.7 – 4.9 m²/l) depending on surface profile of the concrete.

f. **Curing Time @ 73° (23°C)**
   Primer will have achieved cure sufficient to receive membrane within 30 minutes.

g. **Reactivity with non-cementitious Patches**
   Concrete Primer is not recommended for use over Magnesium Phosphate patches unless special preparation is done including removal of top surface, install mechanical anchors, treat with cementitious patch then prepare surface. All other non-cementitious materials to be prepared according to manufacturer's instructions.

h. **Quality Control Testing**
   Moisture readings of concrete surface along with temperature and humidity readings to be taken to ensure surface is above the dew point. Adhesion pull tests to be conducted per ASTM D4541 to determine sufficient surface preparation indicated by a pull resistance greater than 150 psi (1 MPa) on concrete and 300 psi (2 MPa) on steel.

i. **Deficiency Repairs**
   Deficiencies found in the Primer can be repaired by re-applying the primer by roller, squeegee or spray method. No special preparation of the primer surface is required if reapplication is needed provided the area is clean and free from any deleterious material that could interfere with the bond.

III. **Membrane Application**

a. **Storage and Handling**
   Store material in original unopened factory containers, preferably between 55°F and 95°F (13°-35° C). Avoid freezing.

b. **Weather Limitations**
   Membrane can be applied to substrates at temperatures ranging from -20°F to 180°F (18°-82°C), and to substrates whose temperatures are 5 degrees above the dew point with the temperature rising.
c. **Moisture content of Substrate**
   Moisture content of the concrete substrate must be below 5.0% when measured with a Tramex Concrete Moisture Encounter moisture meter or other as approved by Bridge Preservation. Various moisture meters will provide different readings on the same area of concrete and therefore other meters must have been previously been calibrated by the membrane manufacturer. Primed surfaces to receive the membrane are to be dry and free of any standing water.

d. **Protection of traffic, workers, environment and adjacent features**
   Workers in the immediate area are to follow guidelines set out in the MSDS with respect to gloves, respirators, etc. Portable barriers are to be used to trap any overspray of the membrane and to reduce any chance of accidentally spraying adjacent traffic. Any area immediately adjacent the spray area should be taped off or horded to prevent contamination.

e. **Application Rate**
   Membrane to be applied at 80 mils nominal thickness. If the gradient of the bridge exceeds 4.5%, or there is areas where severe braking is anticipated, a second application of membrane will be required at 30 to 40 mils nominal with a broadcast aggregate being placed at 0.5 lbs. per ft² (2.4 kg/M²) prior to having the tack coat applied at 25 ft² per gallon (2 m²/l).

f. **Curing Time**
   Membrane will achieve sufficient cure within 30 minutes to 1 hour at 73°F (23°C) to receive construction traffic.

g. **Bond Strength to substrate**
   Bond strength to substrate to be minimum of 150 psi (1 MPa) on concrete and 300 psi (2 MPa) on steel.

h. **Reactivity with non-cementitious Materials**
   Provided the Primer has been installed to manufacturer’s specifications, the substrate constituency is irrelevant. Compatibility of the primer with the substrate is the major concern.

i. **Quality Control Testing**
   Coating thickness shall be tested in accordance with SSPC-PA 2. On concrete substrates a non-galvanized metal coupons are to be installed by applying a spot application of membrane onto previously primed surface and immediately placing the coupon into the wet membrane. During spray application of membrane a suitable magnetic mil gauge to be used to measure mil thickness to corroborate compliance with specification.

Number of Measurements: Make five (5) separate spot measurements spaced randomly over each 10 m² (100 ft²) area to be measured. If the contracting parties agree, more than five (5) spot measurements may be taken in a given area. The five spot measurements shall be made for each 10 m² (100 ft²) of area as follows:

a. For structures not exceeding 30 m² (300 ft²) in area, each 10 m² (100 ft²) area shall be measured.

b. For structures not exceeding 100 m² (1,000 ft²) in area, three 10 m² (100 ft²) areas shall be randomly selected and measured.

c. For structures exceeding 100 m² (1,000 ft²) in area, the first 100 m² (1,000 ft²) shall be measured as stated in Section i.b. and for each additional 100 m² (1,000 ft²) of area or increment thereof, one 10 m² (100 ft²) area shall be randomly selected and measured.

Spot Measurement: Repeated gauge readings, even at points close together, may differ due to small surface irregularities of the coating and the substrate. Therefore, a minimum of three (3)
gauge readings shall be made for each spot measurement of either the substrate or the coating. For each new gauge reading, move the probe to a new location within the 1.5 inch (4 cm) diameter circle defining the spot.

Adhesion of coating to the substrate shall be in accordance with ASTM D4541 to ensure minimum adhesion values of 150 psi (1 MPa) on concrete and 300 psi (2 MPa) on steel. Pull testing at a rate of 3 minimum or 1 per 2000 ft² (200m²).

At the owners request, spark testing of membrane to be done per manufacturer's instructions. All readings to be recorded in Field Inspection report to be filed with the owner at the completion of the project.

j. *Deficiency Repairs*

If less than spec mil thickness is indicated, re-spraying of the adjacent area may be carried out without any pre-treatment of the repair area, should 8 hours elapse from time of initial spraying surface to be re-activated by wiping with Bridge Deck Membrane Surface Activator at discretion of applicator. Pinholes identified may be re-sprayed or repaired using Bridge Deck Membrane Patch Coat.