SPECIAL PROVISION FOR STRESS ABSORBING MEMBRANE INTERLAYER (SAMI)

This Special Provision will apply when indicated on the plans or in the proposal. Section references herein are to the Department's Standard Specifications for Road and Bridge Construction, current edition.

1.0 DESCRIPTION. Furnish all materials and construct a stress absorbing membrane interlayer (SAMI).

2.0 MATERIALS. Use either asphalt-rubber or polymerized emulsion. Use the same material throughout the project.

2.1 Asphalt-Rubber Mixture (Vulcanized). Use a PG 58-22 that is fully compatible with the rubber. Use granulated rubber conforming to the following requirements:

Sieve Size	Percent Passing
No. 8	100
No. 10	95-100
No. 30	0-10

Specific Gravity: 1.15 ± 0.02

Ensure the granulated rubber is free of fabric, wire or other contaminating materials, except that calcium carbonate dust may be included not to exceed 4 percent by weight, to prevent the particles from sticking together.

2.2 Polymerized Emulsion. Use CRS-2P conforming to Section 806.

2.3 Cover Aggregate. Conform to Section 805. For asphalt-rubber mixture, use size No. 57 or size No. 9M, as the Engineer directs. For polymerized emulsion, use size No. 9M. For sealing or repairing joints, cracks, and spalls, use size No. 11 with no more than 3.0 percent passing a No. 200 sieve, according to KM 64-606 or AASHTO T-11 Procedure B.

Regardless of whether an asphalt-rubber mixture or a polymerized emulsion is used for the SAMI, do not allow the portion of cover aggregate passing a No. 200 sieve to exceed 3.0 percent, as determined by KM 64-606.

For asphalt-rubber mixture, precoat with 0.75 ± 0.25 percent by weight PG 64-22 asphalt binder, and deliver to the project at a minimum temperature of 248 °F.

Prior to beginning work, submit a sample of the aggregate and asphalt material to be used for determination of an initial application rate. The aggregate application rate may be adjusted during construction as the Engineer directs.

2.4 Technical Representative. Provide a technical representative from the producer of the asphalt-rubber or polymerized emulsion, as applicable, to advise at the start of the project. Ensure the technical representative is available thereafter to assist in the event problems or special circumstances arise. Provide technical assistance at no additional cost to the Department.

3.0 CONSTRUCTION.

3.1 Preparation of Underlying Pavement. Fill any joint or crack greater than 1/4 inch wide, flush with the pavement using PG 64-22, hot-poured joint sealer, or other sealant material as directed, prior to placing the SAMI. Patch any spall greater than 3 inches wide and one inch deep using an asphalt mixture the Engineer approves. At the Contractor's option, any joint or crack greater than 1/4 inch wide may be sealed using the SAMI asphalt-rubber or emulsion and immediately blotted with the cover aggregate, prior to placing the SAMI. Any spall less than 6 inches wide and one inch deep may be repaired by mixing, or layering, the asphalt-rubber or emulsion and cover aggregate. Use equipment conforming to Subsection 405.02.03, except that it shall be directed only to the area of repair and be uniform and consistent. The equipment and application used are subject to approval by the Engineer. Patch larger spalls using asphalt mixture, or other materials as approved by the Engineer.

Regardless of the materials used, the completed repairs shall be uniform in consistency and appearance and shall be flush with, or no more than 1/4 inch above, the existing pavement surface.

Sweep the pavement according to Subsection 403.03.02.

3.2 Test Strip. Place a test strip, 500 feet long and one traffic lane wide, to demonstrate that the proposed materials and construction techniques will provide a satisfactory SAMI. Make any adjustments to the operation shown to be necessary by the test strip before continuing work. If the test strip is not acceptable, perform additional work to complete the test strip in an acceptable manner at no additional cost to the Department.

3.3 Asphalt-Rubber. When using asphalt-rubber for the SAMI, provide equipment conforming to Subsection 405.02 and construct according to Subsection 405.03. Use a method and equipment designed to allow the Engineer to readily determine the percentage, by weight, of each of the two materials being incorporated into the mixture. Ensure the equipment maintains a uniform, homogeneous mixture throughout the sealing operation.

Provide an asphalt material and the granulated rubber mixture, proportioned by weight, with 75 to 80 percent asphalt and 20 to 25 percent granulated rubber, subject to the Engineer’s approval. Combine the materials as rapidly as possible for such a time and at a temperature that the consistency of the mix approaches that of a semi-fluid material. The reaction time and temperature of the asphalt material and rubber may vary from a minimum of ten minutes at 450 °F to as much as one hour at 350 °F. The Engineer will verify the reaction before allowing the material’s application to the roadway.

To obtain optimum spraying and wetting viscosity, it may be necessary to add kerosene. If kerosene is necessary, use a high boiling-point kerosene (not less than 350 °F) that does not exceed 2.0 percent by volume of the hot asphalt-rubber composition. Ensure the temperature of the asphalt-rubber does not exceed 350 °F when the kerosene is added. Furnish all equipment and tests necessary to provide control of the mixture and ensure uniform consistency from batch to batch.

Place the asphalt-rubber SAMI only when all of the following conditions can be met.

1) The ambient air temperature is above 65 °F;
2) When placed on stabilized aggregate base, the curing seal of the stabilized base is absolutely dry, or when placed on an existing or new pavement course, the pavement is absolutely dry;
3) The wind conditions are such that a satisfactory membrane with uniform coverage can be achieved.

Immediately after reaching the proper consistency, apply the material and in no case allow the material be held at a temperature over 350 °F for more than 1.5 hours after reaching proper consistency.

Apply the hot asphalt-rubber material at the rate of 0.60 ± 0.05 gallon per square yard.

Make all transverse and longitudinal joints according to Subsection 405.03.03.

Precoat and preheat the cover aggregate and apply according to Subsection 405.03.04.

Apply precoated cover aggregate at the approximate rate of 30 lbs per square yard, or as the Engineer directs. The rate of application is the amount the Engineer deems necessary to protect the membrane.

3.4 Polymerized Emulsion. When using polymerized emulsion for the SAMI, provide equipment conforming to Subsection 405.02 and construct according to Subsection 405.03, except roll and sweep as described below.

Application rates will range between 2.75 to 3.20 lbs of cured residue per square yard for the polymerized emulsion and approximately 30 lbs per square yard for the cover aggregate. The Engineer will establish a specific application rate for the emulsion using the formula:

$$\text{Emulsion Application Rate} = \frac{\text{Desired Rate of Residue}}{\text{Wt/gal x \% Asphalt}}$$

The rate will normally be near the mid-point of the range, but may vary depending on project conditions.

3.5 Compaction of Asphalt Rubber or Polymerized Emulsion SAMI. Use at least 2 pneumatic rollers weighing 10 tons. Provide additional pneumatic rollers as necessary to ensure that the entire surface of the SAMI receives at least 4 complete coverages, with the rollers moving no faster than 5 mph. Make the first pass immediately behind the spreader, and if the spreading is stopped, move the spreader ahead so that all cover material spread may be immediately rolled. Continue rolling until a minimum of 4 complete coverages have been made. Remove loose cover material with an approved mechanical sweeper within 4 hours of final rolling. Continue sweeping until all loose material is removed. The Engineer will make the final judgment on when to sweep the pavement, and when sweeping is completed.

3.6 Tack Coat. When the SAMI is to be covered by an asphalt mixture, apply a tack coat according to Section 406.

3.7 Maintenance and Protection. Keep construction traffic on the completed SAMI to the minimum necessary to complete the work. Do not allow public traffic on the unswept SAMI unless approved traffic control devices or pilot vehicles are

used to keep speeds below 50 mph. Remove loose aggregate by sweeping and/or vacuuming as directed before normal traffic may resume. Cover the completed SAMI with the next course within 48 hours of its exposure to traffic, unless the Engineer permits otherwise.

Before constructing the succeeding course, recheck areas subjected to traffic for grade, cross section and any damage and repair as the Engineer directs.

Repair any damage to the SAMI by hauling or other means at any time at no additional cost to the Department.

3.8 Pavement Construction. Construct subsequent pavement courses as the Contract specifies.

4.0 MEASUREMENT.

4.1 SAMI. The Department will measure the quantity in tons according to Section 109. The accepted quantity of stress absorbing membrane interlayer will be weighed in accordance with Section 109. When asphalt-rubber is used, measurement will include the total quantity of asphalt, rubber, and kerosene.

The Department will not measure for payment any materials or work necessary to fill cracks or spalls, or sweep an underlying pavement and will consider it incidental to this item of work.

4.2 SAMI Cover Aggregate. The Department will measure the quantity in tons according to Section 109.

5.0 PAYMENT. The Department will pay for the completed and accepted quantities under the following:

Code	Pay Item	Pay Unit
00101	SAMI	Ton
00102	SAMI Cover Aggregate	Ton

The Department will consider payment as full compensation for all work required under this provision.

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