Void Reducing Asphalt Membrane for Longitudinal Joints JSP-22-03A

**1.0 Description.** This work shall consist of applying a Void Reducing Asphalt Membrane (VRAM) at longitudinal joints at locations designated in the contract or as specified by the engineer.

**2.0 Materials.** The bituminous material used for the VRAM shall meet the requirements of Table 1. Elastomers shall be added to a base asphalt and shall be either a styrene-butadiene diblock or triblock copolymer without oil extension, or a styrene-butadiene rubber. Air blown asphalt, acid modification and other modifiers will not be allowed.

**Table 1: Bituminous Material Requirements**

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| --- | --- | --- |
| Test | Test Requirement | TestMethod |
| Dynamic shear @ 88°C (unaged), G\*/sin δ, kPa | 1.00 minimum | AASHTO T315 |
| Creep stiffness @ -18°C (unaged)Stiffness (S), MPam-value | 300 maximum0.300 minimum | AASHTO T313 |
| Ash, % | 1.0-4.0 | AASHTO T111 |
| Elastic recovery, 100 mm elongation, cut immediately, 25°C, % | 70 minimum | ASTM D6084 Method A |
| Separation of Polymer, Difference in ring and Ball , °C | 3 maximum | ASTM D7173 |

**3.0 Equipment.** The equipment used for applying the VRAM shall be capable of applying the VRAM in a single pass at the specified application rate and width.

**3.1 Pressure Distributor.** When a pressure distributor is used to apply the VRAM, the distributor shall be equipped with a heating and recirculating system along with a functioning auger agitating system or vertical shaft mixer in the hauling tank to prevent localized overheating.

**3.2 Melter Kettle.** When a melter kettle is used for transporting and/or application of the material. Equip the melter kettle with an oil jacketed double-boiler type with agitating and recirculating systems. Dispense material from the kettle through a pressure feed wand with an applicator shoe or with a spray bar.

**4.0 Construction.**

**4.1 Surface Preparation.** Prior to the application of the VRAM ensure the area of the intended longitudinal asphalt pavement joint is thoroughly cleaned and free of debris. Clean the area by sweeper/vacuum truck, power broom, air compressor or hand to the satisfaction of the Engineer. Ensure the existing surface is dry and free of moisture. Milled surfaces may require the use of compressed air to remove dust and fine materials from the area where VRAM will be applied.

**4.2 VRAM Location and Application.** When applying the VRAM material, the following location and application rate criteria shall be followed:

(a) The center of the VRAM application full width pass shall be within 2 inches of the project established centerline or established lane edge.

(b) When applying VRAM to one-half of an exposed joint on a mill and overlay project, the vertical face of the cold joint left in place shall be coated. This will be paid as VRAM Half Width.

(c) The VRAM shall be applied in a single pass to the existing surface. The tack coat may be applied before or after the VRAM. When applying VRAM after the tack coat, the tack coat shall be free of moisture as not to affect the bonding of the VRAM. At the time of installation, the pavement surface temperature and the ambient temperature shall be a minimum of 40 F (4 C) and rising.

(d) The width (W) of the VRAM shall be a minimum of 18 inches +/- 1.5 inches and the VRAM half width (W/2) application shall be a minimum of 9 inches +/- 1.0 inches as designated below. If the VRAM flows more than 2 inches from the initial placement width, stop paving and take remedial action subject to the Engineer’s approval.



VRAM

(e) The minimum full width VRAM application rates shall be in accordance with Table 2. Half width VRAM application rates shall be one-half of the full width application rate.

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| **Table 2: VRAM (Full Width 18-inch) Application Rates; lb/ft** |
| Mix Types | SP095 | SP125  | SP190 | SMA Mixtures(SP095BSM/SP125BSM) |
| Asphalt Lift Thickness |
| Less than45 % Passing No. 8 Sieve | > 45 % Passing No. 8 Sieve | Less than40 % Passing No. 8 Sieve | > 40 % PassingNo. 8 Sieve | Less than35 % Passing No. 8 Sieve | > 35 % PassingNo. 8 Sieve |
| 1 ¼” | 1.31 | 0.88 |  |  |  |  |  |
| 1 ½” | 1.47 | 0.95 |  |  |  |  | 1.26 |
| 1 ¾” | 1.63 | 1.03 | 1.63 | 1.03 |  |  | 1.38 |
| 2” | 1.80 | 1.11 | 1.80 | 1.11 |  |  | 1.51 |
| > 2 ¼” |  |  | 1.96 |  | 1.96 | 1.11 |  |

(f) Prior to start of paving of pavement course, ensure the paver end plate and grade control device is adequately raised above the finished height of the VRAM.

(g) The VRAM shall be suitable for construction traffic to drive on without pick up or tracking within 30 minutes of placement. If pick up or tracking occurs, stop paving and take remedial action subject to the Engineer’s approval.

(h) If rain is forecasted and traffic is to be on the VRAM or if pickup/tracking of the VRAM material is likely, the VRAM shall be covered immediately following its application with fine aggregate mechanically spread uniformly at a rate of 1.5 ± 0.5 lb/sq yd. Fine aggregate landing outside of the VRAM shall be removed prior to application of tack coat.

**4.3 VRAM Documentation.** The contractor shall provide a daily report with the following information:

1. Control Section/Project Number/County/Route/Engineer.

(b) Date/Detailed Weather Information/Pavement Temperature.

(c) VRAM Application Temperature.

(d) Beginning and Ending Stations of Placement.

(e) Source, Manufacturer, and date shipped for each load of VRAM.

(f) Dimensions: Length, Width, and Total Square Feet.

(g) Signature of Contractor's Authorized Representative.

**4.4 VRAM Sampling and Testing.** A one-quart sample shall be taken randomly from the pressure distributor or melting kettle at the jobsite once for each contract and sent to the Construction and Materials Central Laboratory at 1617 Missouri Blvd, Jefferson City, MO.

**4.5 VRAM Application Rate Verification.** The VRAM application rate shall be verified within the first 1,000 feet of the day’s placement and every 12,000 feet at random locations designated by the engineer thereafter. A suitable paper or pan shall be pre-weighed and placed in the path of the VRAM. After VRAM application, the paper or pan shall be weighed, and the application rate calculated. The tolerance between the application rate in Table 2 and the calculated rate shall be within +/- 10 percent. The VRAM shall be replaced in the area where the sample was taken.

**5.0 QC/QA Changes**

**Delete Section 403.16.1 and substitute the following:**

**403.16.1 Joint Composition.** Longitudinal joints shall be formed by the use of an edging plate fixed on both sides of the finishing machine. When the VRAM material is satisfactorily placed, the unconfined longitudinal joint density in the table within **Sec 403.19.3** for Test and Pay Factor Items will not be required and the pay adjustments will not apply. There will be no density requirement within 6-inches of the confined or unconfined longitudinal joint. The joint shall be compacted as a typical unconfined or confined longitudinal joint.

**Delete Section 403.23.6 Density Adjustment in its entirety.**

**6.0 Method of Measurement.** Final measurement of the surface treatment will not be made except for authorized changes during construction, or where appreciable errors are found in the contract quantity. Where required, measurement of the VRAM material, complete in place, will be made to the nearest linear foot. The revision or correction will be computed and added to or deducted from the contract quantity.

**7.0 Basis of Payment.** Payment for the VRAM will be paid for at the contract unit price per linear foot for one the following pay items:

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| --- | --- | --- |
| **Item No.** | **Unit** | **Description** |
| 405-99.03 | Linear Foot | Void Reducing Asphalt Membrane, Full Width |
| 405-99.03 | Linear Foot | Void Reducing Asphalt Membrane, Half Width |

No separate payment will be made for any additional construction methods or processes.