

**Standard Department of Transposition Specification**  
**STRESS ABSORBING MEMBRANE S/A (Self Adhesive)**

**DESCRIPTION**

**005-1.1** This item shall consist of the installation of a Stress Absorbing Membrane S/A system applied to a repaired concrete surface on longitudinal and transverse cracks and over joints and patches in preparation for asphalt overlay, in accordance with these specifications and in conformity to the dimensions and typical cross sections shown on the plans, or as directed by the engineer.

**005-2.1** The Stress Absorbing membrane S/A shall be a system of materials manufactured in a composite fashion with performance substantiated through defined laboratory testing using a LVDT device and simulated A/C overlay or PCC slabs.

The Stress Absorbing Membrane S/A shall consist of a viscoelastic self adhesive membrane sandwiched between a release film liner and a polyester fabric meeting the requirements of AASHTO M288-92. The viscoelastic self adhesive membrane shall be designed to fully bond with the existing pavement with the help of a tack coat on milled surfaces, and be capable of accommodating sufficiently large stresses at the joint/crack without breaking its bond with the PCC slab or A/C pavement. The viscoelastic membrane shall be designed to prevent water entry into the pavement base course through cracks and/or joints in the pavement, and act as a Stress Absorbing Membrane S/A between the overlay and the underlying pavement. The geotextile on the top of the composite shall also be designed to fully bond with the overlay and provide high tensile stiffness reinforcement to the overlay. Stress Absorbing Membrane S/A shall be supplied in rolls of minimum 36-in. width.

Acceptable products covered by this specification are Pavetech International, Paveprep S/A Reflective Crack Retarding Composites. To be approved by the Engineer, test performance of the product submitted must at a minimum meet the quality standards discussed above. Contractor shall make the materials submittals at least 14 days prior to planned initial installation. No installation will be permitted until the submittal(s) is/are approved in writing by the engineer.

**005-2.2** If marginal existing surface temperatures are present or the Stress Absorbing membrane S/A is being placed onto a milled PCC / A/C pavement, a tack coat is required to ensure optimum adhesion. Use of a tack coat is required over all milled surfaces. Typical tack coats include AC 20, AC 30, PG 64-22, PG 67- 22, SS-1, SS-1h, CSS-1, or CSS-1h. Tack coats should be applied at 0.15 gallon/square yard (0.75 liters/square meter). AC/PG tack coats are preferred but when emulsified tack coats are used, they should be allowed to fully “break” before material is placed.

**CONSTRUCTION METHODS**

**005-3.1 INSTALLATION.** Adequate bonding of the Stress Absorbing Membrane S/A is a combined function of tack coat application rate, application temperature and spray width, temperature of the existing surface during application, and rolling equipment and procedures. The installer must fully comply with the installation requirements listed in these procedures. The Stress Absorbing Membrane S/A shall be installed according to the manufacturer’s recommendations.

**005-3.2 PREPERATION OF SURFACE.** The surface upon which the Stress Absorbing Membrane S/A will be placed must be free of dirt, water, and vegetation. In all areas milled (ground down) to receive the overlay pavement, surface cracks/joints exposed by the milling shall be treated as follows. Surface crack/joints ½” (13mm) wide or less need not be cleaned or filled. Surface cracks/joints and other distressed areas greater than ½” (13mm) but less than 2” (51mm) wide shall be cleaned and filled with an approved crack filler or hot-mix asphalt (maximum 3/8” (9.5mm) aggregate size) compacted to the existing elevation. Cracks/joints and other distressed areas greater than 2” (51mm) wide shall be cleaned and filled with hot-mix asphalt (maximum 3/8” (9.5mm) aggregate size) compacted to the existing elevation. Cracks and joints or milled ridges with vertical elevation variations greater than ½” (13mm) shall be wedged with compacted hot-mix asphalt to level the distressed area.

If hot-mix asphalt is used to fill cracks or pre-level vertical elevation variations, any loose asphalt particles shall be broomed or blown clean in areas where the Stress Absorbing Membrane S/A will be applied.

**05-3.3 ASPHALT TACK COAT.** A properly applied asphalt tack coat is required to help adhere the Stress Absorbing Membrane S/A to milled surfaces. The width of the tack coat application shall be such that the tack coat extends a maximum 1-1/2 inches on both sides of the Absorbing Membrane S/A strip.

Typical tack coats include AC 20, AC 30, PG 64-22, PG 67- 22, SS-1, SS-1h, CSS-1, or CSS-1h. Tack coats should be applied at 0.10 gallon/square yard (0.50 liters/square meter). AC/PG tack coats are preferred but when emulsified tack coats are used, they should be allowed to fully “break” before material is placed.

Pavetech International PCF-100™ adhesive, or approved equivalent, or a rubberized asphalt cement crack filler meeting the requirements of ASTM D 3405 (employing no solvents) may be used as tack coat for difficult applications, such as when the overlay must follow immediately after application of the tack coat, placing **STRESS ABSORBING MEMBRANE S/A** in cold weather, or when applying on heavily spalled pavements. The minimum recommended application temperature for PCF-100 is 350 degrees F.

The contractor shall use one of the following options to apply the tack coat to the existing surface:

- A. Use a hand-held wand with a nozzle that produces a fan shaped spray and apply a tack coat evenly at the specified rate and width.
- B. Use a hand-held wand without a spray nozzle to apply the tack coat to the existing surface and use a squeegee to spread the asphalt to the specified rate and width.
- C. Application of the tack coat directly from the distributor bar on a distributor truck is permitted for all transverse and longitudinal applications. The distributor bar nozzle should be set at 20 degrees to the axis of the bar and care must be taken to apply the tack coat at the correct width and rate.

The width of the tack coat application shall be such that the tack extends out from the edge of the Absorbing Membrane S/A strip being installed a minimum of ½” (13mm) and a maximum of 1-1/2” (38mm) on both sides. The area to be tack coated may have to be outlined on the existing pavement surface if the required width cannot be otherwise controlled.

**CAUTION:** Application of the tack coat in excess of recommended rates and/or excessive tack coat widths may cause Stress Absorbing Membrane S/A to slip or may cause the overlay to shove during the overlay or tears in the overlay resulting in unacceptable ride quality.

#### **005-3.4 PLACING Stress Absorbing Membrane S/A**

**SURFACE CONDITIONS:** Stress Absorbing Membrane S/A shall be applied when existing surface temperature is a minimum of 50 °F (10°C) and rising. The existing surface must be *clean and dry* prior to installing the Stress Absorbing Membrane S/A

**CAUTION:** The use of solvents (i.e., kerosene, gasoline, diesel fuel, and such) or other materials such as those used to clean paving equipment and tools is strictly prohibited. In the event that such solvents or materials come in contact with the Stress Absorbing Membrane S/A, the contaminated Stress Absorbing Membrane S/A shall be immediately removed from the jobsite and discarded.

**CUTTING TO SIZE.** The Stress Absorbing Membrane S/A shall be cut (when necessary) with a razor knife from the woven polyester (or top) side. Frequent changes of the knife blade may be necessary to maintain a sharp blade and avoid frayed edges.

**JOINING** Stress Absorbing Membrane S/A strips shall be butted together at transverse and longitudinal joints or where two rolls must be joined. **Do not overlap.** The transverse strips shall be continuous; longitudinal strips shall be cut at the transverse strips.

**PLACEMENT INTO THE ASPHALT TACK COAT.** The high strength grid (silver - gray) side of the Stress Absorbing Membrane S/A composite must be placed up (traffic side), with the SELF ADESHIVE Polymer side with the blue plastic release film removed (black) side placed into the tack coat. The Stress Absorbing Membrane S/A shall be centered as closely as possible over the crack or joint, but in no case shall the edge of the Stress Absorbing Membrane S/A be less than 15 inches from the crack or joint.

Place Stress Absorbing Membrane S/A immediately after the tack coat is applied to the surface.

Stress Absorbing Membrane S/A should be placed at least 2 hours in advance of paving operations. If application must immediately precede the paving operation, a rubberized asphalt cement or adhesive (such as PCF-100™) is required as a tack coat to bond the Stress Absorbing Membrane S/A to the existing surface.

The material shall be laid smooth with no uplifted edges. It is critical that the edges of the SAM be securely bonded to the pavement surface.

**ROLLING:** Stress Absorbing Membrane S/A shall be rolled with a riding static drum or rubber wheeled roller **immediately** after it is placed on the tack coat with. A hand roller weighing a minimum of 100 lbs. is permissible. Care should be taken to insure that the edges of the Stress Absorbing Membrane S/A are securely bonded to the pavement surface.

On milled surfaces, the Stress Absorbing Membrane shall be rolled into the tack coat with a rubber wheeled roller. The rolling effort should consist of one to three passes.

**TRAFFICKING AND PROTECTION OF the Stress Absorbing Membrane S/A.** Construction traffic only, while such use should be minimized, may begin using the area on which the Stress Absorbing Membrane S/A has been installed as soon as the tack coat has been cooled to ambient temperature. Any traffic should be kept at slow speeds with braking and turning minimized, and should be closely monitored. Small amounts of dry washed absorptive (non-silica) sand may be used to blot excessive asphalt tack when necessary to facilitate movement of construction traffic over the Stress Absorbing Membrane S/A prior to placement of the asphalt overlay. Placed material exposed to freezing conditions shall be overlaid as soon as possible (such exposure not to exceed 48 hours). The combination of cold, brittle tack coat, and unnecessary traffic may cause damage to the SAM. Repair any Stress Absorbing Membrane S/A damaged after the placement by removing (3) three feet (1m) in either direction of the damaged area and replace with new material, without overlapping, following the above procedure. Damaged Stress Absorbing Membrane S/A shall be removed and replaced at Contractor's expense.

Paving operations can only begin when the Stress Absorbing Membrane S/A is thoroughly bonded to the existing surface.

**005-3.5 ASPHALT OVERLAY.** Once the Stress Absorbing Membrane S/A is installed, it may be exposed to moisture and rain prior to the application of the overlay. However, **the Stress Absorbing Membrane S/A must be dry at the time the overlay is placed.**

A paving tack coat shall be applied over the Stress Absorbing Membrane S/A and the entire surface to be overlaid at the rate shown in the project plans, or as a specified by the engineer. **Cutback asphalts are prohibited.** Hot-mix asphalt or dry washed absorptive sand or limestone dust can be broadcast ahead of the paver if the SAM is sticking to the tires of the trucks or paving equipment.

The minimum compacted asphalt **overlay** thickness shall be 2" (51mm). Milling may be required at transitions between types of pavement being overlaid and at the edges of overlay in order to meet the 2" (51mm) thickness requirement. The minimum **lift** thickness shall be 1-1/2 inches, compacted.

**CAUTION:** Asphalt **overlay** thickness less than 2" (51mm) would reduce the effectiveness of Stress Absorbing Membrane S/A in reducing reflective cracking. In addition, overlay **lift** thickness less than 2" (51mm) would likely cause a shadow of the Stress Absorbing Membrane S/A strip on the surface of the overlay or tears in the overlay resulting in unacceptable ride quality.

Hot-mix asphalt compaction procedures shall be in accordance with acceptable asphalt paving standards and practices.

**When using a vibratory roller for compaction, avoid the use of excessive amplitude. Use of excessive amplitude during the compaction process may cause a shadow of the Stress Absorbing**

**Membrane S/A strip on the surface of the overlay, resulting in unacceptable ride quality. The vibratory roller should be set to the lowest amplitude and highest frequency settings allowable while meeting the compaction requirements of the overlay.**

### **METHOD OF MEASUREMENT**

**005-4.1** The quantity of membrane system to be paid for shall be the number of square feet in place installed in accordance with the specifications and accepted by the Construction Manager as complying with the plans and specifications.

### **BASIS OF PAYMENT**

**005-5.1** Payment shall be made at the contract unit price per square foot for the membrane system. This price shall be full compensation for furnishing all materials (except tack coat for overlay) and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item MC-003 **STRESS ABSORBING MEMBRANE S/A per Square Foot**

### **MATERIAL REQUIREMENTS**

AASHTO M-288

ASTM D-977

ASTM D-3381

ASTM D-3404

ASTMD-3405

AC 20- AC 30- PG 64-22- PG 67- 22-

SS-1H, CSS-1- CSS-1H.

**END OF ITEM STRESS ABSORBING MEMBRANE S/A**