

**SAMPLE SPECIFICATION
(ISAC)
Interlayer Stress Absorbing Composite**

Illinois Project No.:215-2612
AIP Project No.: 3-17-0136-B4
RANTOUL, ILLINOIS

ITEM AR201671 – CRACK CONTROL MATERIAL

DESCRIPTION

1.1- This item of work shall consist of the installation of an Interlayer Stress Absorbing Composite (ISAC) on existing longitudinal and transverse joints and on random cracks prior to construction of the bituminous overlay. The Resident Engineer will designate the cracks to which the ISAC will be applied.

1.2-COORDINATION

A pre-installation meeting between the Contractor and the manufacturer is required. The manufacturer shall be present during the installation of the ISAC membrane.

MATERIALS

2.1-ISAC MEMBRANE

The ISAC (Interlayer Stress Absorbent Composite) membrane shall be distributed on rolls 48 feet in length and 36 inches wide and 0.15 inches thick and shall be a system of materials manufactured in a composite fashion with performance substantiated through a defined laboratory testing using a LVTD device and simulated ACC overlay of PCC slab.

The ISAC shall consist of a viscoelastic membrane sandwiched between a low modulus, low stiffness geotextile (stiffness>700N/m) on top of the composite. The bottom geotextile shall be designed to fully bond with the existing pavement with the help of a tack coat, and be capable of accommodating sufficiently large stresses at the joint/crack without breaking its bond with the slab. The viscoelastic membrane shall be designed to prevent water entry into the pavement leveling course through cracks and/or joints in the pavement, and act as a Stress Absorbing Member Interlayer (SAMI) between the overlay and the underlying pavement. The high modulus, high stiffness geotextile on top of the composite shall be designed to fully bond with the overlay and provide high stiffness and reinforcement to the overlay.

The defined laboratory testing shall be completed at the University of Illinois on an LVDT device in an environmental chamber capable of simulating thermal stress in a slab and joint at varying temperature ranges.

An acceptable product covered by this special provision is the Pavetech ISAC Reflective Crack Retarding Composite available from Pavetech International.

2.2-STORAGE

The stress relief membrane shall be stored inside a closed building and not exposed to moisture or rain prior to installation. The plastic wrap packaging on the pallets does not protect the material from moisture or rain. Any material that becomes wet prior to installation shall be removed from the jobsite and discarded. Inside storage temperatures shall not exceed 120° F (49° C).

2.3-ISAC TACK COAT

The asphaltic tack applied to the pavement surface shall be an AC-20 (PG 64-22) Asphalt Cement which meets the requirements of AASHTO M266.

The minimum application temperature for AC-20 (PG 64-22) tack shall be between 310° - 340° F (154° to 171° C). The tack must be applied at a rate of approximately 0.15 gallons/square yard (0.70 liters/square meter) over existing surfaces and approximately 0.20 gallons/square yard (0.90 liters/square meter) over milled surfaces.

2.4- PAVING TACK COAT

A paving tack must be used over the ISAC membrane prior to paving. The tack shall be a rapid-set emulsified asphalt (such as SS-1 or SS1h) in accordance with item 603 at a rate of 0.20 gallons per square yard. Cutback asphalts are prohibited. Hot mix asphalt or washed sand can be broadcast ahead of the paver if the membrane is sticking to the tires or trucks or paving equipment.

CONSTRUCTION METHODS

3.1- SURFACE PREPARATION

The surface upon which the stress relief membrane will be placed must be free of dirt, water and vegetation. Surface cracks/joints 1/4" (6mm) wide or less need not be cleaned or filled. Cracks/joints wider than 1/4" (6mm) shall be cleaned, then filled with Pavetech's PCF-100 hot applied crack filler or approved equal, Mastic One, or hot-mix asphalt compacted to the existing elevation.

3.2- INSTALLATION

Adequate bonding of the stress relief membrane 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.

3.3 -SURFACE CONDITIONS

The stress relief membrane shall be applied when the existing surface temperature is a minimum of 50° F (10° C) and rising. The existing pavement surface must be clean and dry prior to installation of the stress membrane.

Caution: The use of solvents (i.e. kerosene, gasoline, diesel fuel and such) or other agents such as those used to clean paving equipment and tools are strictly prohibited. In the event that such solvents or agents come into contact with the membrane, the contaminated materials shall be immediately removed from the pavement and/or the jobsite and discarded.

3.4 -ISAC TACK COAT APPLICATION

Application of the tack coat directly from a distributor bar on a distributor truck is permitted for all transverse and longitudinal applications. If a distributor truck is used for longitudinal applications, the distributor bar nozzles should be set at 20° to the axis of the bar and care must be taken to apply the tack coat at the correct width and rate.

The maximum width of the tack coat application shall be such that the tack extends a maximum 1-1/2" (38 mm) on both sides of the stress relief membrane strip.

Caution: Application of the tack coat in excess coat in excess of the recommended rates and/or excessive tack coat spray widths may cause the stress relief membrane to slip or may cause the overlay to shove during the paving process. This slippage and/or shoving can cause a shadow of the stress relief membrane strip on the surface of the overlay or tears in the overlay resulting in an unacceptable ride quality.

The use of emulsified asphalts and/or cutbacks are strictly prohibited for use as a tack to bond the stress relief membrane to the existing pavement surface.

3.5 - PLACING STRESS RELIEF MEMBRANE

The stress relief membrane shall be cut (when necessary) with a razor knife from the woven polyester side (top). The woven polyester side of the material must be placed upon (exposed to traffic) with the nonwoven side rolled into the tack.

The stress relief membrane must be placed such that it is centered over the crack or joint on the existing surface and such that a minimum of 6" of the membrane extends beyond the edges of the joint.

The material shall be laid smooth and with no uplifted edges. It is critical that the edges of the stress relief membrane be securely bonded to the pavement surface. The stress relief membrane shall be placed and rolled **immediately** with a riding static drum roller or a rubber tire roller. The second rolling effort must follow the hand roller by no more than three (3) minutes.

The stress relief membrane should be placed at least 2 hours in advance of paving operations. If application must immediately precede the paving operation, a rubberized asphalt cement may be required as a tack coat to bond the stress relief membrane to the existing surface.

Where two or more pieces of membrane meet, the membrane must be butted.

Once the membrane is installed, it may be exposed to moisture and rain prior to the application of the overlay. However, the stress relief membrane must be dry at the time the overlay is placed.

Although not required, small amounts of washed sand may be used to blot excess asphalt cement tack coat when necessary to facilitate movement of traffic or construction equipment over the membrane prior to placement of the overlay. Remove and replace and damaged ISAC membrane with the corresponding width and length.

Paving operations shall only begin when the membrane is thoroughly bonded to the existing surface. The minimum asphalt overlay lift thickness shall be 2" (51mm) compacted.

Caution: Asphalt overlay lift thickness that are less than 2" (51mm) will impact the effectiveness of the membrane in reducing/retarding reflective cracking. In addition, overlay lift thicknesses less than 2" (51mm) may cause a shadow of the membrane on the surface of the overlay or tears in the overlay resulting in an unacceptable ride quality.

Asphalt hot-mix compaction procedures must be in accordance with acceptable asphalt paving standards and practices.

When using a vibratory roller for compaction, care must be taken to avoid the use of excessive amplitude. Use of excessive amplitude during the compaction process may cause a shadow of the stressed relief membrane strip on the surface of the overlay resulting in an unacceptable ride quality. The vibratory roller should be set to the lowest amplitude and highest frequency settings.

3.6 - TRAFFIC

The ISAC material should be minimized. Any traffic should be kept at low speeds with breaking and turning minimized and should be closely monitored. The Contractor must pave immediately after placement of the fabric provided it is dry.

METHOD OF MEASUREMENT

4.1 - ISAC membrane will be measured for payment in lineal feet along the joint in place satisfactorily installed and maintained.

The hot mix asphalt used to seal cracks/joints wider than 3/4" shall not be measured for payment but is incidental to this item.

BASIS OF PAYMENT

5.1 - Payment will be made at the contract unit price per lineal foot of the ISAC membrane. This price shall be full compensation for furnishing all ISAC materials, ISAC tack material, paving tack material and any required broadcast sand, equipment, labor and other incidentals to complete this item.

Payment will be made under:

Item AR201671 – Crack Control Material – per lineal foot.