Civil-Tex

Geosynthetics & Engineering

GUIDE SPECIFICATION & INSTALLATION – Pro-Guard® 4592

HEAVY-DUTY COMPOSITE PAVING STRIP MEMBRANE

DESCRIPTION - This work shall consist of furnishing and placing a heavy-duty pavement repair composite membrane over pavement cracks, joints, and other pavement distress areas prior to placement of a pavement overlay. The membrane shall be installed as indicated on the plans and contract documents.

MATERIAL REQUIREMENTS - The pavement repair membrane shall consist of a modified asphalt layer sandwiched between a nonwoven, needle-punched, polypropylene fabric and a high modulus woven fabric. The membrane shall be **Pro-Guard® 4592** or approved equal and shall meet the physical requirements specified on Table 1.

Table 1. Physical Properties of the Heavy-Duty Composite Strip Membrane

Property	Test Method	English (1)	Metric (1)
Tensile Strength: Machine Direction Cross Machine Direction:	ASTM-D-882 (2)	 325 lb/in (2400) (lb/in^2) (3) 325 lb/in (2400) (lb/in^2) (3)	 56 kN/m (16,500 kN/m^2) (3) 56 kN/m (16,500 kN/m^2) (3)
Elongation (4)	ASTM-D-882 (2)	100 %	100 %
Peel Adhesion	ASTM-D-413	0.7 lbs/in	0.12 kN/m
Specific Gravity (mastic)	ASTM-D-70-82	1.67	1.67
Weight/Gallon (mastic)	ASTM-D-70-82	14.0 lbs	1.67 kg/l
Density	ASTM-E-12-70	80 lbs/ft^3	1280 kg/m^3
Weight	ASTM-D-5261	0.9 lbs/ft^2	4.4 kg/m^2
Thickness	ASTM-D-5199	0.135 in (5)	3.4 mm (5)
Water Absorption (mastic)	ASTM-D-517-92	1 % (6)	1 % (6)
Brittleness	ASTM-D-517-92	Passes	Passes
Softening Point (mastic)	ASTM-D-36-86	212^o F	100^o C
Cold Flex	ASTM-D-146-90 (7)	No Separation	No Separation
Heat Stability	-	Passes (8)	Passes (8)
Polymeric Reinforcement	AFFC (9)	3,500,000	3,500,000
Flammability	FMVSS 302	Passes (10)	Passes (10)

Notes:

1 Minimum average roll values unless otherwise noted
2 Using 12 in/min test speed and a 1" initial distance between grips
3 Based on specified thickness of 0.135 in
4 Elongation at break
5 Minimum 95% retained after loading
6 Maximum value
7 Using a 2"x 5" specimen, 180^o bend on a 2" mandrel at 0^{o}F
8 No dripping or delamination after 2 hrs at 190^{o}F on a 2" x 5" sample suspended vertically
9 Amoco test method, cycles to break (single fiber)
10 Self-extinguishing, no burn rate

The tack coat used to bond the pavement repair membrane to the pavement should be a paving grade asphalt cement. Asphalt emulsions may be used in certain cases where paving grade asphalt cement is not available or where there are equipment limitations. Asphalt emulsions should not be used unless the ambient temperature is 70° F (21 °C) and rising. The Contractor shall furnish and use the tack coat in accordance with the recommendations of the pavement repair membrane manufacturer. Materials shall be stored and handled in accordance with the manufacturer's recommendations.

USE - Pavement repair membrane is used for repair of localized pavement cracks and joints. The fabric dissipates stresses in the pavement, retards cracking, and reduces water infiltration. A tack coat is placed to bond the membrane to the pavement. The membrane is applied in strips over cracks and joints in Portland cement or bituminous concrete pavements. The membrane is then overlaid with a bituminous concrete overlay using standard paving procedures.

CONSTRUCTION METHODS - The pavement repair membrane shall be installed in accordance with the manufacturer's recommendations and the following requirements.

Preparation of existing surface: The pavement surface shall be cleaned of dirt and other foreign materials. The surface shall be dry, with no lingering moisture around pavement cracks. Cracks greater than 5/8 inch (16 mm) in width shall be filled with suitable crack filler. If necessary, Portland cement concrete slabs shall be stabilized.

Tack coat placement: A tack coat shall be furnished and placed on the prepared pavement as specified by the membrane manufacturer. The tack coat shall be applied uniformly to the prepared, dry pavement surface. The temperature of the tack coat shall be sufficiently high to permit uniform application. The tack coat application rate shall be 0.1 to 0.2 gallons per square yard (0.46 to 0.91 liters per square meter) as required by the roadway surface and environmental conditions. The target width of the tack coat application shall be equal to the pavement repair membrane width plus 2 inches (51 mm). If an emulsion is used, it must be allowed to cure **completely** before the pavement repair membrane is placed. Traffic shall not be allowed on the tack coat. Excess tack coat shall be cleaned from the pavement.

Membrane placement: The pavement repair membrane shall be placed immediately after tack coat application. The membrane shall be centered over joints and cracks to be treated and shall be rolled after placement. The membrane shall be extended at least 6 inches (152 mm) onto sound pavement beyond the ends and sides of the crack or joint. Should a crack require more than one strip, adjacent membrane strips shall be butt joined. Membrane which is damaged due to the Contractor's operations shall be removed and replaced at the Contractor's expense. The installed membrane shall be approved by the Engineer prior to paving operations.

Overlay placement: A standard pre-paving tack coat shall be applied over the pavement and pavement repair membrane. Paving mix should be applied as specified

in the plans and contract documents; however, a the first lift of asphalt concrete over the Pro-Guard membrane interlayer must have compacted overlay thickness of at least 1½ inches (38 mm).

Vehicle traffic: Traffic should not be permitted on the installed pavement repair membrane due to safety considerations. Traffic should be limited to construction vehicles. If traffic is required on the membrane before the overlay is placed, such traffic should be only temporary and must be approved by the Engineer. Harsh traffic conditions, such as high speeds, turning, and braking, must be avoided. Warning signs should be posted to alert drivers that the surface may be slippery. Signs should also post a safe speed.

Temperature: The pavement temperature shall be at least 45°F (8° C) and rising for tack coat application and membrane installation.

MEASUREMENT AND PAYMENT - The pavement repair membrane will be measured in place by the square yard (square meter). The accepted quantities of pavement repair membrane will be paid for at the contract unit price per square yard (square meter) in place.