

Relationship between Asphalt Interlayers

And

A. Asphalt Stripping

*B. Bleeding or Rutting
pavements*

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Two issues of misinformation consistently plague the Fabric Interlayer Industry and need to be clarified.

1. *Non permeable membranes CAUSE hot mix asphalt to strip.* The following information much better depicts the situation.

Three conditions must exist for Asphalt stripping to occur.

- a. The use of an aggregate that is “incompatible” or “stripping prone” with the asphalt binder
- b. Existing conditions that result in the asphalt section being saturated with water. (e.g. high water table, evapotranspiration in arid climates, lack of free draining road base).
- c. Heavy loads at high frequency (Truck traffic)

A properly installed membrane *will* intercept water coming from the surface and stop that water from passing through the AC section to the base and subbase. Therefore the moisture content of the layer above the membrane *may* be higher for a short period of time prior to evaporation or lateral discharge. In the reverse scenario where the water is coming from below, it will be intercepted and again will remain until it can be discharged laterally. In both cases, if the section was inadequately compacted during construction, the potential for increased water storage is definitely a possibility.

In summary, the controlling elements as to the eventual failure of the section are;

- A. Incompatible aggregate and asphalt binder
- B. Inadequate compaction of hotmix and resultant excess voids
- C. Impermeable or non-draining road base
- D. Lack of edge drains

The above design shortcomings can be exacerbated by an impermeable membrane, BUT are not CREATED by a membrane.

Therefore, the substantial benefits provided by an impermeable membrane;

- A. Extend the flexural life of asphalt section
 - B. Maintain structural value of base and subbase due to stopping surface water penetration
 - C. Mitigate the propagation of cracks in the existing lift into the new lift
- should not be abandoned due to inherent shortcomings of the initial hotmix design.

2. *The binder used in the interlayer, unless minimized, causes bleeding or rutting of overlays.* The misconception is that the interlayer is a source for “excess” asphalt. In reality, a properly installed membrane system uses ALL of the asphalt applied for the interlayer system. Specifically, the manufacturer provides the asphalt retention volume for their fabric. This is typically about .25 gallons per square yard(33.6 oz/sy, .1.14 kg/m²) for a 3.7-3.8 oz/sy (126-129gm/m² fabric). {Note: The .25 gallons/sy includes .05 gal/sy to tack to the old and new surface}. In other words, when placing a fabric of this weight, ALL of the liquid asphalt placed at the prescribed rate will be needed for the interlayer system with no asphalt is available for any other system(the asphalt overlay).

Current construction practices, unfortunately, find installers reducing the binder application rate in order to avoid “potential” bleeding, rutting and slipping problems of the new overlay. However, when one looks at the volume of asphalt available from the interlayer system, one can see that the quantity is insufficient to impact the integrity of the overlaying section.

Example:

Assume compacted asphalt weight to be 144 lbs/cf. For a 2” lift that translates to 216 pounds per sy. If the mix is 5.5% asphalt binder that is 190 oz of liquid asphalt in the hot mix. Based on the studies by Mr. Button, of TTI, the asphalt content of the hot mix has to be increased by .6 to 1.0% to change the physical properties of the mix. This is an additional 21 to 35 oz/sy. To add this much liquid asphalt in the interlayer phase, one would need to apply the binder at between .50 & .53 gal/sy.