RESEARCH NOTES HIGHWAY DIVISION MATERIALS & RESEARCH SECTION
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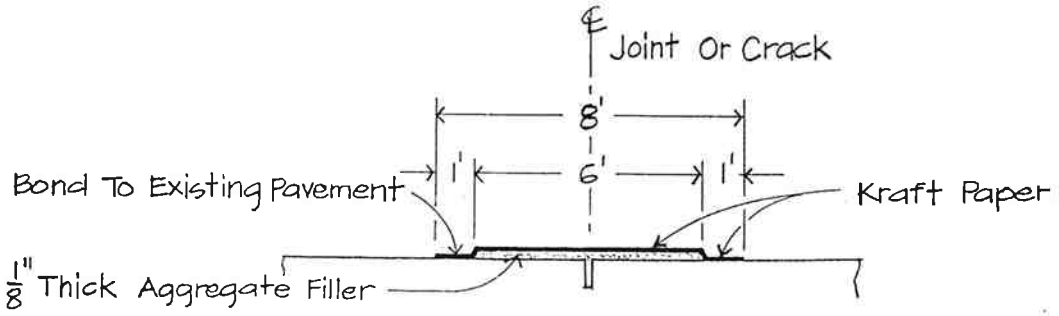
RSN 90-2

GEOTEXTILE STUDY

The Oregon Department Of Transportation has had the opportunity to use geotextile materials in two experimental feature studies. Both were unique applications and are not representative of all geotextile uses. These ODOT studies are.

Study 1: "Use Of Fabrics For Reflective Crack Control In Asphalt Concrete Overlays Over PCC Jointed Pavements"

This project was constructed in 1975 on a four lane section of I-5. Throughout the project a 3-inch base course, a 2-inch top course, and a 1-inch open graded wearing course were applied over existing PCC pavement with doweled joints spaced 62 +/- feet. A various combination of continuous geotextile fabrics and bond breakers (see figure 1) were placed in various levels of the overlay. The materials were: Petromat, by Phillips Petroleum Company; Fabric I-1980, by Burlington Glass Fabrics Company; and Typar Style 3401, by DuPont.



(Figure 1: Bond Breaker Details)

Fabrics placed directly over the PCC pavement without a bond breaker did not perform any better than the control sections (no fabrics or bond breakers). Fabrics placed at mid depth, without a bond breaker, delayed cracking at least 2 years. Where the fabrics were placed with a bond breaker, reflective cracking was delayed at least six years.

Even though the fabric-bond breaker combination retarded the occurrence of reflective cracking, the application is not believed to be cost effective at this site. In this case the cost of the fabric and bond breaker exceeded the benefit occurred by retarding the reflective cracking.

(over)

Study 2: "Geotextile Strips As A Reflective Crack Treatment For AC Over AC"

This project was constructed in 1988 on I-84. The section was overlaid with 2 1/4 inches of dense graded polymer modified asphalt concrete. In addition twenty four inch wide strips of AMOCO CEF Style 4545 geotextile fabric were placed over high severity thermal cracks. Strips were used in this case because the cracks were widely spaced (+/- 50'). This spacing did not justify the expense of continuous coverage.

This region has low rainfall and extreme temperature differentials. The average rainfall is 10 inches. The ambient air temperature can be as low as 0 deg. F in January and as high as 110 deg. F in July. The freeze thaw season is from October through April.

Within one year 67% (linear feet of original cracking) of the cracks had reflected through. Statistical analysis of the data showed no difference between the test section and the control section. In both sections most of the cracks extended across the road from shoulder to shoulder. No other types of distress were observed.

The light-weight, non-woven, geotextile strips placed directly over the cracks were not effective in preventing thermally caused transverse cracks from reflecting through the AC overlay. These lightweight geotextiles, by themselves, can not resist the stresses caused by thermal cracking.

The information here applies only to the conditions present in each test. The ability of paving fabrics to resist fatigue related cracking was not part of these studies.

A synthesis of current information and practices on the use of fabrics in asphalt overlays will be published by a national level research organization. When the synthesis is received we will publish another research note discussing their findings.