

THE WAR ON REFLECTIVE CRACKING



Crack 140 (transverse) in September 1998 before overlay



Crack 140 (reflective) in May 1999 after overlay

HISTORY

Transverse cracking is a major problem on Highway 97. The design life of the pavement is shortened due to premature cracking, thus increasing maintenance costs. In September 1998, a test section near Chemult was established to study the effectiveness of 5 different geosynthetics in reducing reflective cracking. The test section was inspected in May 1999. The locations where the crack reflected through were numbered with silver paint on the east shoulder.

REFLECTIVE CRACKING

Reflective cracking is produced at nearly regular intervals in asphalt pavement due to shrinkage and brittleness during very cold temperatures. The minimum temperatures recorded by the Oregon Climate Service for two nearby sites were:

- 23°F (30 year low) in 10/98 at Silver Lake
- 20°F in 10/98 at Wickiup Dam

Crack 140 (treated with a geosynthetic) is shown above. The figure below is a crack covered with a geosynthetic prior to overlay.

INSPECTION RESULTS

Approximately 23% of the original reflective cracking returned for the control and crack fill only sections. Approximately 7% of the original reflective cracking returned for the geosynthetic products. *However, since the first inspection is less than 8 months after construction, no conclusions can be drawn from this data.* A cost analysis will be performed at the end of the project to evaluate the value of the geosynthetics.



Geosynthetic over crack before overlay

GEOSYNTHETIC TYPES

The 5 geosynthetics tested are listed below.

Geosynthetic Specifications

Glasgrid 8502®

Pavement reinforcing mesh consisting of fiberglass reinforcement coated with an elastomeric polymer and a pressure sensitive adhesive backing

GeoTac®

Peel-and-stick, thick waterproofing membrane manufactured from a rubberized asphalt, with a top layer of durable, tightly bonded polyester geotextile

PavePrep SA®

Heavy-duty crack reduction/stress relief interlayer consisting of a flexible high density asphaltic membrane laminated between a nonwoven and woven polyester geotextile, with an adhesive backing

Polyguard Cold Flex 2000 SA™

Peel-and-stick pavement repair membrane consisting of two layers of high strength polypropylene fabric with a layer of flexible mastic to provide stress relief

Polyguard 665™

Pavement waterproofing membrane consisting of a rubberized asphalt waterproofing adhesive, laminated to a strong woven polypropylene backing, with a silicone treated release sheet

INSPECTION OBSERVATIONS

There appeared to be patterns in the asphalt overlay that could be the start of reflecting cracks. However, since the overlay is an open-graded mix, the voids seem to form lines and play tricks on your eyes, as shown above. So, for this inspection, only the cracks that are obvious were noted.



Glasgrid 8502® exposed at surface of overlay
(Note: patterns apparent in mix)

CONSTRUCTION PROBLEMS

Overall, the overlay is in good condition. Of the installation problems noted in the construction report, the Glasgrid 8502® geosynthetic at crack 30 is exposed as seen above. When the paver paved over crack 30, the paver ski hooked the material and pulled about 2 m of it from the southbound shoulder. The end of the remaining material was not buried under the overlay, but left exposed at the surface. There does not appear to be any impact to the pavement so far.

FUTURE INSPECTIONS

The test section will be inspected in the spring of 2000 and 2001. A final report will be published by the fall of 2001.

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