

Floyd County FN-18-6(14)--21-34

Background

1. The contractor was Fred Carlson, Inc. of Decorah, Iowa.
2. The fabric area of the project is located on U.S. 18 approximately one mile east of Rudd, Iowa eastward to Station 300+00.
3. The fabric was placed in the month of June, 1979. The asphaltic concrete overlay was all two inches in thickness except for one 2500 foot section of three inch.
4. The fabrics used in the reinforcement areas were Petromat, a nonwoven polypropylene manufactured by Phillips Petroleum Company, and Bidim C-28, a nonwoven polyester manufactured by Monsanto Company. The Cerex (3.0 oz.) and Mirafi 140 as listed on the plans were not used. The Cerex fabric was not available, and the Mirafi 140 was not recommended for this application.
5. A total of 23,955 square yards of fabric reinforcement was placed.
6. The cost of the fabric was \$1.10 per square yard in place.
7. Four (4) 2500-foot sections of fabric reinforcement were placed full width of the pavement, separated by comparison control sections. In addition, a 2500-foot test section of 3" ACC was placed. The fabric was lapped one foot in the direction of traffic and one foot longitudinally between lanes of ACC paving.

Areas of Placement of Fabric Reinforcement,
Control Sections, and 3" ACC

<u>Station</u>	to	<u>Station</u>	<u>Type</u>
50+00		75+00	3" ACC
75+00		100+00	Petromat
100+00		125+00	Control
125+00		150+00	Bidim
150+00		175+00	Control

Areas of Placement of Fabric Reinforcement,
Control Sections, and 3" ACC

<u>Station</u>	to	<u>Station</u>	<u>Type</u>
225+00		248+00	Petromat
248+00		275+00	Control
275+00		300+00*	Bidim
300+00		325+00	Control

*Bidim was placed to Station 296+00 on right side of the pavement and to Station 300+00 on the left side.

8. A crack survey was made on the first 1000 feet of each section before the asphalt overlay was placed. Only the lineal footage of all cracks was recorded. A follow-up crack survey was made January 25, 1980, of the first 1000 feet of each section and another was made on November 5, 1980. These follow-up crack surveys show the development of cracks at an early age.
9. More extensive surface patching was done in the area of Station 50+00 to Station 110+00 than on the remainder of the sections.
10. The 1979 AADT was 3720 VPD with 19% trucks.
11. The test areas are over PCC pavement, which has been resurfaced with 3 to 6 inches of ACC and which is 22 feet in width.

On May 18, 1983, Robert Shelquist, Don Jordison and John Roland made a field examination of the test and control sections with the purpose of evaluating the performance of the fabrics as compared with each other and as compared with the control sections.

The evaluation determinations made are as follows:

1. The 3" ACC section (Sta. 50+00 - 75+00) has the least amount of reflection cracking of any of the sections. There were numerous transverse cracks but very little longitudinal or random cracking.
2. The section (Sta. 125+00 - 150+00) containing Bidim fabric reinforcement was in the worst condition in regard to the magnitude and severity of cracking. This section was judged to be worse than any other section including the control areas.
3. The Petromat section (Sta. 75+00 - 100+00) was judged to have slightly less cracking than the other areas including control sections.
4. The other fabric reinforced sections and control sections were rated the same in regard to the footage and severity of cracking.
5. It is not possible to identify the fabric treated areas from the control sections from visual observation while walking over the resurfacing on the project.
6. The fabrics do not decrease the longitudinal and diagonal cracking as was expected. Secondary transverse cracking was also evident in both the fabric reinforced and control sections.
7. It would be very difficult to justify the additional \$26,350 expended for the fabric reinforcement when comparing these sections with the control sections.
8. To quantify these visual observations, it is suggested that Operations Research conduct a follow-up crack survey on the first 1000 feet of each section as was done previously by the residency. This would involve 9 sections (9000 ft.) and would permit a calculation of the percentage of cracks reflected (after 4 years) of those present before the overlay was placed.

Crack Survey Before Overlaid

A crack survey was made in the first 1000 ft. of each section. Lineal footage of cracks are as follows:

Areas of Placement and Control Sections

<u>Station</u>	<u>to</u>	<u>Station</u>	<u>L.F. Crack</u>	<u>Type</u>
50+00		75+00	3796	3" A.C.C.
75+00		100+00	5328	Petromat
100+00		125+00	6331	Control
125+00		150+00	3951	Bidim
150+00		175+00	4581	Control
225+00		250+00	4954	Petromat
250+00		275+00	3930	Control
275+00		300+00	4243	Bidim
300+00		325+00	4000	Control

FABRIC REINFORCEMENT ON U.S. 18 EAST OF RUDD

A follow-up crack survey was made January 24, 1980, in the first 1000 feet of each section. Lineal footage of cracks are as follows:

Areas of Placement and Control Sections

<u>Station</u>	to	<u>Station</u>	<u>L.F. Crack</u>	<u>Type</u>
50+00		75+00	22	3" A.C.C.
75+00		100+00	22	Petromat
100+00		125+00	88	Control
125+00		150+00	198	Bidim
150+00		175+00	264	Control
225+00		250+00	55	Petromat
250+00		275+00	440	Control
275+00		300+00	0	Bidim
300+00		325+00	110	Control

FABRIC REINFORCEMENT ON U.S. 18 EAST OF RUDD

A crack survey was made November 5, 1980, in the first 1000 feet of each section. Lineal footage of cracks are as follows:

<u>Station</u>	<u>to</u>	<u>Station</u>	<u>Type</u>	<u>L.F. Crack</u>	<u>Change</u>
50+00		75+00	3" A.C.	84	+62
75+00		100+00	Petromat	93	+71
100+00		125+00	Control	155	+67
125+00		150+00	Bidim	423	+225
150+00		175+00	Control	480	+216
225+00		250+00	Petromat	201	+146
250+00		275+00	Control	525	+86
275+00		300+00	Bidim	135	+135
300+00		325+00	Control	165	+55