SUMMARY

The Greene County, Iowa overlay project, completed in October 1973, was inspected on October 16 & 17, 1978 after five years of service.

The 33 fibrous concrete sections, four CRCP sections, two mesh reinforced and two plain concrete sections with doweled reinforcement were rated relative to each other on a scale of 0 to 100. The rating was conducted by the original members of the Project Planning Committee, Iowa DOT, Iowa Counties, Federal Highway Administration, University of Illinois and industry representatives. In all, there were 23 representatives who rated this project. The 23 values were then averaged to provide a final rating number for each section.

The highest panel rating (90) was assigned to the 5-inch thick, deformed bar reinforced PCC sections; an 86 to a 3-inch thick, 160 lbs. of fiber and 600 lbs. of cement on a partial bonded surface; an 84 to the 4-inch CRCP with elastic joints (bonded) and an 84 to a 4-inch mesh reinforced section.

One of the major factors influencing performance appears to be the thickness. In the fibrous concrete overlays, the greatest influence appears to be the fiber content. Overlay sections containing 160 lb/yd^3 of fiber are, in almost all cases, outperforming those containing 60 or 100 lb/yd^3.

It is obvious at this time that the 3-inch thick fibrous concrete overlays are, in general, out performing the 2-inch thick sections.

The performance of the fibrous concrete overlays appears to be favorably influenced by:

(1) The use of higher aspect ratio fiber (0.025 x 2.5 inches) versus (0.010 x 0.022 x 1.0 inches)

(2) The use of a lower cement content (600 versus 750 lb/yd^3)

However, these trends are less well defined and the improvements in overlay performance attributed to high aspect

ratio fibers and low cement contents are not large and may prove to be insignificant.

The intended type of bonding was referred to as: 1. Bonded; 2. Partial; 3. Unbonded. Based upon performance, the sections where bond was intended are in better condition than the partial or unbonded counterparts. Delamtect survey results that bond was not achieved even in the "bonded" sections.

Research on bonded pavement overlays in 1976 and 1977 by the Iowa DOT, Clayton County, Iowa, City of Waterloo and the Iowa Concrete Paving Association proves that bond can be achieved with grout applied to a prepared dry, clean surface.

The major distress in the fibrous concrete overlays is the presence of numerous longitudinal cracks over the widening section. In many cases, this was brought about by failure to achieve the intended overlay thickness.

The formation of longitudinal cracks in the fibrous concrete is more prevalent in the westbound lane over the widening section where traffic loads are greater. In sections where full width and full depth patching without widening was done there is no evidence of longitudinal cracking.

It is felt that the longitudinal cracks over the widening section could be reduced if higher strengths were attained, minimum overlay thickness was maintained or complete bond was achieved.