RESEARCH NOTES HIGHWAY DIVISION RESEARCH SECTION
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RSN 85-1

RESEARCH PROJECT CONCLUDES LATEX MODIFIED FIBROUS CONCRETE NOT RECOMMENDED FOR PRESENT USE

Because of construction problems and long-term problems with cracking, spalling, and delamination, a recently completed Experimental Features research project concluded that Latex Modified Fibrous Concrete should not be recommended for bridge deck overlays.

Latex Modified Fibrous Concrete (LMFC) is concrete to which latex and small steel fibers are added. The fibers increase concrete strength, while the latex allows the water content to be reduced. The latex also serves to limit shrinkage and increase the bond between the fiber and concrete and the bond between the overlay and existing deck. Previous research indicated that a 1 1/2 inch overlay of LMFC should be as good as thicker overlays of low-slump latex modified concrete. Also it was believed that LMFC would have superior toughness and freeze-thaw durability, as well as better abrasion, skid, and impact resistance.

To test these claims, research was conducted on four Oregon bridges overlayed with LMFC in 1981. Problems immediately arose on the first overlay project while trying to finish the deck. The tining process tended to pull and tear the steel fibers on the surface, producing a rough and unpleasant ride. Concrete grinding was required to make the surface acceptable. Balling of the steel fibers in the concrete mix was also a constant problem in all of the overlays, with the balls having to be removed prior to finishing.

Post-construction evaluations produced mixed results, with the LMFC overlays showing signs of serious cracking at expansion joints, as well as cracking, spalling and delamination at the overlay meet lines. On the positive side, the overlays showed little sign of rutting, and after four years of service, severe transverse cracks on one structure had not reflected through the overlay.

While Latex Modified Fibrous Concrete is still thought to have good potential, until the problems mentioned above are corrected, it is not recommended for future use in Oregon.

For further information on this report contact Oregon State Highway Division Research Section. Ask for:

"Latex Modified Fibrous Concrete -- Experimental Features Final Report" by William Quinn and Leon Brock, Oregon State Highway Division, Research Section, March 1985

Experimental Features Project OR 81-01