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RESEARCH UPDATE

U95-3

THIN POLYMER OVERLAY - GEORGIA VT.

Reference:

Research Update U95-1

HISTORY:

Bridge Number 10, located on TH #1 in Georgia, Vermont was identified as in need of rehabilitation because of extensive and premature cracking. Rather than the standard waterproofing membrane and bituminous concrete overlay, the rehabilitation incorporated a thin polymer overlay to preserve the existing, at-grade joint. The Supplemental Specification for thin polymer overlays, Section 534, includes approval of three products. The contractor, Parent Construction, Inc. of Hinesburg, Vt. selected the Tamms (formerly Dural) Flexolith polymer concrete deck overlay system.

PRODUCT INFORMATION:

The Tamms Flexolith polymer concrete bridge deck overlay system consists of an epoxy polymer binder combined with an aggregate containing aluminum oxide. The Flexolith binder is a two component, 100% solids, epoxy resin compound.

CONSTRUCTION:

Project work began on 3 Aug '94. Deck preparation consisted of shot blasting, and thorough broom cleaning. This procedure was meticulously adhered to, but did not include drying with blown hot air, as previously reported.

As described in Research Update U95-1, mixing time of the two part epoxy resin is very critical because it begins to set up almost immediately after blending. Also, as previously reported, the polymerization process is extremely exothermic; however, the manufacturer has informed us that a worst case scenario involving a runaway reaction would result in a boil-over and advancement of the product to end point (i.e. the point at which the chemical reaction is complete and the product has solidified) in the mixing vessel. The construction process for the Georgia, BR #10 overlay went smoothly throughout, and there were no mishaps.

FIELD OBSERVATION AND COMMENTS:

BR #10 in Georgia was revisited on 18 Apr '95 and inspected for cracking and debonding. Chain dragging was performed at selected areas to detect delaminations. This inspection was performed because previous experience in Vermont with another thin polymer overlay had resulted in significant debonding after one winter in service. The survey of BR#10 in Georgia revealed no problems with cracking or debonding.

Development of thin polymer overlays is a relatively new technology, and earlier generations of these products had generally poor performance. But according to a recently published report from New York, which was quoted extensively in Research Update U95-1, more recent testing suggests optimism for suitability and durability of newer polymer systems. At this point in time, optimism would seem appropriate for the Georgia project as well.

FOLLOW UP:

Monitoring of BR #10 in Georgia will continue on an annual basis, with emphasis on inspection for cracks and debonded areas, until the overall performance of the treatment can be evaluated.