INSTRUMENTATION AND EARLY PERFORMANCE OF AN INNOVATIVE PRESTRESSED PRECAST PAVEMENT SYSTEM

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ABSTRACT

Traffic, weather and de-icing salts continually diminish pavement life. Current rehabilitation methods result in traffic congestion and lost work time. The use of prestressed, precast panels for the replacement of damaged roadways and intersections will give designers a significant advantage in improving pavement performance, decreasing construction time, and mitigating user costs.

A pilot project, funded by FHWA, was created for a 1,000 ft (305 m) stretch of pavement on I-57 in southern Missouri. Seven of the 100 precast roadway panels used were instrumented to monitor temperatures, strains, and strand strains during fabrication, construction, and service.

Objectives include examining early hydration temperatures and corresponding strains, comparing transfer strains (both pretensioning and post-tensioning) to analytical predictions, and analyzing service strains related to daily thermal variations, seasonal trends, and traffic. Condition surveys and materials studies complete the year long performance evaluation and are discussed in companion works by Brent Davis and Grant Luckenbill (currently underway).