EXECUTIVE SUMMARY

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 Ohio Route 50 Joint Sealant Experiment

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This is the third and Final Report for a research project that entailed the construction and evaluation to date of a stretch of a four-lane highway near Athens, Ohio. The main purpose of this project has been to evaluate concrete pavement performance in connection with various sealant types and joint configurations in the Wet-Freeze climatic zone. A detailed description of previous work conducted from Fall 1996 to March 2000 can be found in two interim reports submitted to ODOT during the course of the project.

Fifteen different material-joint configuration combinations have been used. The new pavement consists of a 250-mm (10-in.) jointed reinforced concrete slab with 21-ft joint spacing, placed over a 100-mm (4-in.) free-draining base layer, constructed over a 150-mm (6-in.) crushed aggregate subbase, resting over the predominantly silty clay local subgrade. The highway has a twenty year design period, with design traffic level of 11 million ESALs. The eastbound lanes were constructed first and have been open to traffic since Spring 1998, whereas the westbound lanes have been serving traffic only since Spring 1999.

Three joint sealant, profilometer and pavement performance surveys are described in this Report. These evaluations were conducted in October 2000, June 2001, and October 2001 in accordance with an evaluation plan developed by the University of Cincinnati research team based on statistical principles. Sealant effectiveness values are calculated and treatments are ranked according to a rating scheme that describes each sealant type very good, good, fair, poor, or very poor. Results from these evaluations are analyzed and compared to those from earlier inspections to delineate the major trends exhibited by the test pavement.

During the March 2000 evaluation, a significant flooding event was witnessed. Apparently in the days prior to the evaluation substantial amounts of rainfall had occurred. The Hocking River, which runs along the highway, could not handle the amount of water from the storm. Several fields adjacent to the roadway were flooded and the drainage ditches overflowed. The extensive flooding concerned the UC research team and an investigation of the drainage aspects of the test pavement was initiated soon after. Following the flooding several transverse cracks were noticed in the pavement. Both the development of structural distresses and the drainage features of the pavement system are also examined in this Report. It is reported that significant mid-slab cracking has been observed in the test pavement, but that this distress appears unrelated to the performance of the sealant treatments.

It is anticipated that pavement and sealant performance monitoring will continue for several years. Several recommendations for future investigations are formulated.