

HR-244 Detection of Concrete Delamination by Infrared Thermography

Key Words: Bridges, Overlays, Delamination detection, Infrared thermography

ABSTRACT

Iowa has approximately 1000 bridges that have been overlaid with a nominal two inches of portland cement concrete (PCC). A Delamtect survey of a sampling of the older overlaid bridges indicated delaminations in several of them. Eventually these bridges as well as those that have not received an overlay must be programmed for rehabilitation.

Prior to rehabilitation the areas which are delaminated must be identified. There are currently two standard methods of determining delaminated areas in bridge decks; sounding with a metal object or a chain drag and sounding with an electro-mechanical sounding system (Delamtect). Sounding with a metal object or chain drag is time consuming and the accuracy is dependent on the ear of the operator and may be affected by traffic noise. The Delamtect requires less field time but the graphical traces require that data reduction be done in the office.

A recently developed method of detecting delamination is infrared thermography. This method is based on the temperature difference between sound and delaminated concrete.

A contract was negotiated with Donohue and Associates, Inc. of Sheboygan, Wisconsin, to survey 18 PCC overlaid bridge decks in Iowa using the infrared thermography method of detecting delaminations.

The objectives of the project were to assess the accuracy, dependability, and potential of infrared thermography for detecting delamination on PCC overlaid bridge decks and bonded overlays of PCC pavement.