

Public Abstract

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This paper covers the research performed to determine the reliability of infrared technology as an inspection tool for concrete bridge components. Concrete deteriorates due to the corrosion of embedded reinforcing steel. These cracks join to form delaminations, propagate to the surface which results in spalling. The ability to detect those delaminations in the structural components of a bridge (deck, superstructure and substructure) is vital when determining when those components need to be repaired or replaced.

The objectives of the research were to:

- Quantify the capability and reliability of thermal imaging technology in the field
- Field test and validate inspection guidelines for the application of thermal imaging for bridge inspection
- Identify implementation barriers faced by inspectors in the field

Infrared cameras were given to each participating state of a pooled fund project for field inspections. The states were trained to effectively use the technology. A verification trip to each state to gather data and ensure the inspectors are utilizing the technology correctly is in the process of completion. These data were consolidated to a shared data site for analysis. A new system was developed to address the quantification of infrared data. This system used multiple infrared images over time and measured the rate of change of infrared radiation, as opposed to instantaneous infrared images captured with a hand held camera. Phone interviews were conducted to determine possible implementation barriers of the technology. Infrared technology has proved to be a useful inspection tool for concrete bridge components. Results are quantifiable with the new system and further testing is being performed