

January -April 2010 Project Update

PennDOT Project #070202

Project Title: Inspection Methods & Techniques to Determine Non Visible Corrosion of Prestressing

Strands in Concrete Bridge Components (LU ID 541671)

Contract #: 355I01

Lehigh University / ATLSS Research Center

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Overview

This interim report provides an update on the progress of PennDOT Project: Inspection Methods & Techniques to Determine Non Visible Corrosion of Pre Stressing Strands in Concrete Bridge Components. The project initiated in December 20, 2007 and was originally scheduled to be completed on December 19, 2009. A no-cost extension to the project has been granted by PennDOT and the new scheduled completion date is June 19, 2010. This report covers the time period from the January 18, 2010 to April 05, 2009.

Organizational Modifications

The project has continued to operate with the original upper level staff. The project is being conducted by Clay Naito (PI), Stephen Pessiki (co-PI), Richard Sause (co-PI), and Ian Hodgson (co-PI). Larry Jones is working as the primary graduate researcher on the project and will continue through to project completion.

Project Tasks

In the past months work has progressed in several areas. First, draft reports have been submitted to PennDOT for approval; comments are pending. Second, concrete test-slabs were designed and constructed such that the two magnetic NDT technologies will be used to attempt to detect various reinforcement damage. Third, feasibility of 3D Laser Scanning for bridge monitoring will be investigated and a short report will be issued.

NDE Inspections

The non destructive evaluation of the beams has been completed. Lehigh University had concrete test-slabs designed and fabricated such that two of the original NDE Contractors could be further evaluated. The Vector Group – Remnant Magnetization – and Dr. Al Ghorbanpor – Magnetic Flux Leakage – have recently completed testing of their NDE methods on these slabs. The results of the laboratory experiments are currently being analyzed. The NDE method of 3D Laser Scanning will be further evaluated in terms of feasibility and practicality of field use.

The NDE test-slabs were fabricated at Lehigh University. This effort required purchase of materials and technician time. The material costs included lumber, concrete, and plastic sheeting for curing of the slabs.

Destructive Evaluation of Beams

The destructive evaluation of the beams has been completed.

Forensic Evaluation of Concrete Cores

Erlyn and associates has returned their full report. All data has been analyzed and included in the draft Forensic Report issued to PennDOT in December of 2009.

Upcoming Schedule

- Analyze the results of Magnetic Flux Leakage and Remnant Magnetization methods for accuracy and scope in identifying strand defects.
- 3D Laser Scanning methods will be investigated for feasibility and practicality of use in the field.
- Inspection Training Documentation. If one of the techniques studied is viable, training documentation and specifications will be prepared for this technique by Specialty Engineering, Inc. If it is deemed that no viable technology exists, revisions to current inspection guidelines (Pub. 238) along with accompanying training material (e.g., PowerPoint presentation) will be prepared by Specialty Engineering, Inc. A determination will be made after discussions with PennDOT.
- Revisions to reports shall be made upon receipt of comments from PennDOT with respect to the Forensic Evaluation and NDT Reports.