

Research in Progress

Development of Comprehensive Inspection Protocols for Deteriorated Steel Beam Ends

Research Need

The outcome of a recently completed research project has found new parameters which are extremely important when assessing the residual capacity of deteriorated bridges and the load rating procedure. It is important for MassDOT to strongly consider the new load rating procedures in drawing realistic conclusions accounting for these new parameters

Goals/Objectives

The objectives of this project are:

1. Effective and consistent procedures for collecting important data from deteriorated steel beam ends using new procedures and providing a clear list of measurements and tasks for inspectors to follow during inspections.
2. Explore new practical inspection techniques and also provide inspection solutions using new technology such as LiDAR scanning or drone technology to obtain the critical measurements.
3. A comprehensive inspection and documentation protocol which will be used along with the new load rating procedures for more accurate and effective load rating of steel bridge beam ends.
4. Identification and classification of unique cases which would require future research or advanced modeling that cannot be described by the new load rating procedures.

Research and Technology Transfer Section
MassDOT Office of Transportation Planning
Planning.Research@dot.state.ma.us

Project Information

This project is being conducted as part of the Massachusetts Department of Transportation (MassDOT) Research Program with funding from Federal Highway Administration (FHWA) State Planning and Research (SPR) funds.

Principal Investigators:

Dr. Simos Gerasimidis and Dr. Sergio Brena

Performing Organization:

University of Massachusetts Amherst

Project Champion:

Alexander Bardow, MassDOT

Project Start Date:

February 2020

Expected Project Completion Date:

September 2021

Methodology

This research will include the review and documentation of current inspection procedures across the different MassDOT districts and identify the impact of the important parameters in the remaining capacity of deteriorated beam ends.

The research will use LiDAR and unmanned aircraft systems technology to obtain critical data for the load rating procedure. Measurements in the lab and on the site will be taken and their accuracy and efficiency will be assessed. Based on these findings, a homogenization of the data will be performed for the new inspection protocol.

The system behavior of bridges with deteriorated beam ends will be explored through computational methods.

