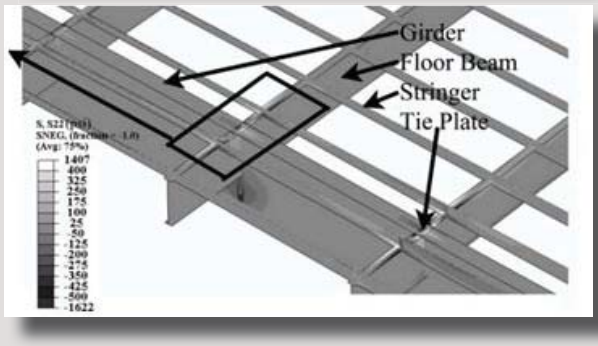
RESEARCH
PROJECT CAPSULE [18-4ST]
June 2018
TECHNOLOGY TRANSFER PROGRAM

Load Rating of Existing Continuous Stringers on Louisiana's Bridges



Top: Diagram of a trussed bridge
(Photo credit: Roads &Bridges, 2014)

Bottom: Bridge FEM details
Photo credit: **Journal of Bridge Engineering. *ASCE / JUNE 2013***

PROBLEM

In accordance with Louisiana Department of Transportation and Development (DOTD) policies and guidelines for bridge rating and evaluation, all bridges shall be rated using the Load and Resistance Factor Rating (LRFR) method as specified by the American Association of State Highway and Transportation Officials (AASHTO).

Both local buckling and lateral torsional buckling (LTB) are considered when determining flexural resistance of a girder compression flange. LTB resistance is determined for uniform major-axis bending moment, and a moment gradient factor (C_b) is applied to account for the effects of variable moment along an unbraced girder length.

The AASHTOWare Bridge Rating™ analysis software is used when load rating a bridge's continuous stringers. This software, by default, takes the C_b value calculated by the AASHTO LRFD design code. As a result, a bridge's rating may become low enough to require restrictive load posting or even closure. There is an immediate need for re-assessment of the methodology for load rating of existing continuous stringers.

OBJECTIVE

The objective of this project is to evaluate the true capacity of bridge structures built with continuous stringers and to develop a new approach for rating those structures, focused on more accurate values for the C_b factor.

METHODOLOGY

After conducting a review of relevant domestic and international guidelines and specifications, including research findings and industry experience, the research team will

JUST THE FACTS:

Start Date:
June 1, 2018

Duration:
15 months

End Date:
August 31, 2019

Funding:
SPR: TT-Fed/TT-Reg

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POINTS OF INTEREST:

Problem Addressed / Objective of Research / Methodology Used Implementation Potential

identify knowledge gaps in developing a reasonable C_b factor. Findings will be summarized in a presentation and interim report for the project review committee (PRC).

Based on PRC direction, the research team will prepare and submit a work plan for subsequent tasks. The work plan will include development of a methodology for C_b determination, including a procedural flowchart and Excel spreadsheet for bridge rating calculations. Laboratory testing and finite element analyses will be conducted for verification of the "new" methodology, and a detailed summary of the entire project will be produced as a final report.

IMPLEMENTATION POTENTIAL

Findings from this research will result in a more accurate load rating of existing continuous stringers. As a result, restrictive load posting or unnecessary rehabilitation of bridges may be avoided, allowing for more optimal allocation of resources while maintaining public safety.