



RESEARCH PROJECT CAPSULE [16-1ST]

July 2016

TECHNOLOGY TRANSFER PROGRAM

Retrofit of Existing Statewide Louisiana Safety Walk Bridge Barrier Railing Systems

JUST THE FACTS:

Start Date:
July 1, 2016

Duration:
24 months

End Date:
June 30, 2018

Funding:
SPR: TT-Fed/TT-Reg

Principal Investigator:
William F. Williams, P.E.
Crashworthy Structures Program-
Riverside 7091
Texas A&M Transportation Institute

Administrative Contact:
Tyson Rupnow, P.E., Ph.D.
Associate Director, Research
225-767-9124

Technical Contact:
Walid R. Alaywan, P.E., Ph.D.
Sr. Structures Research Engineer
walid.alaywan@la.gov
225-767-9106

Louisiana Transportation
Research Center
4101 Gourrier Ave
Baton Rouge, LA 70808

Sponsored jointly by the Louisiana
Department of Transportation and
Development and Louisiana State
University

POINTS OF INTEREST:

Problem Addressed / Objective of
Research / Methodology Used
Implementation Potential

WWW.LTRC.LSU.EDU

PROBLEM

Currently, the Louisiana Department of Transportation and Development (DOTD) maintains approximately 200 miles of concrete safety walk barrier railing systems on its bridges. Some of these vintage systems do not meet the current crash performance requirements of the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (AASHTO MASH) specifications.

Most existing safety walk bridge barrier railing systems consist of a concrete curb, a concrete safety walk, and a concrete parapet or post and rail system. The safety walk on these bridges is desirable for bridge inspection/maintenance activities, and for general safety of stranded drivers or pedestrians. Retrofits that meet the current MASH requirements for Test Level 4 (TL-4) and maintain the concrete safety walk are needed.

OBJECTIVE

The purpose of this research project is to evaluate the strength and performance of the safety walk bridge barrier railing systems currently used by DOTD. The system designs will be evaluated with respect to MASH specifications. For the common barrier railing systems that do not meet the requirements, retrofit options will be engineered, designed, and detailed.

METHODOLOGY

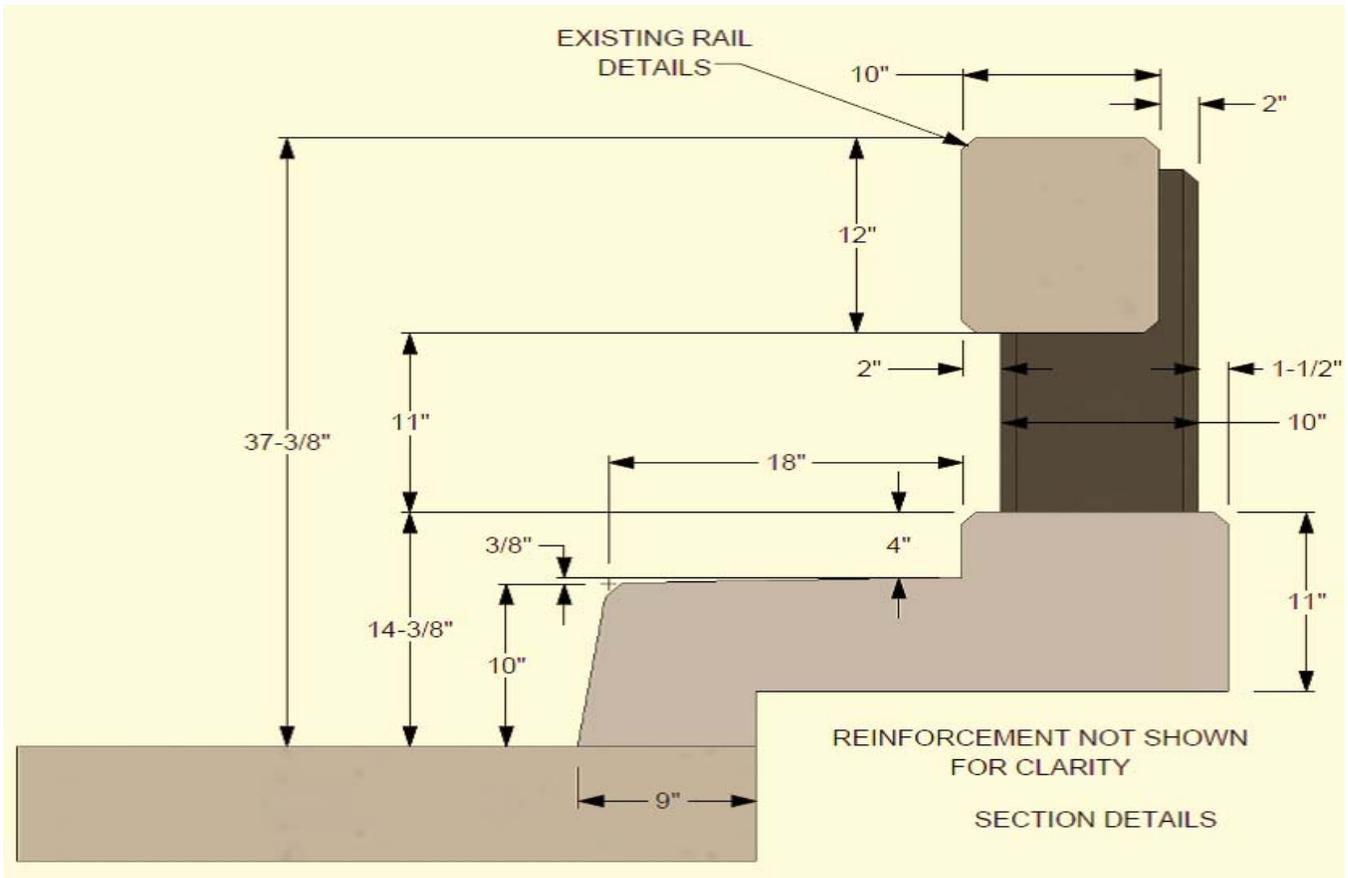
An extensive review of all available safety walk bridge barrier railing systems used by DOTD will be performed. The research team will work closely with DOTD personnel to select the most common types used in Louisiana and will perform engineering analyses on the selected designs in accordance with guidelines of the American Concrete Institute and the American Institute of Steel Construction.

Loads used in the analyses will be in accordance with MASH TL-4 impact conditions. Some existing barrier railing systems may only be acceptable for MASH TL-3 conditions. A three-beam-guardrail block out system and a precast-concrete-panel block out system are two retrofit options for consideration. The retrofit options developed for this project will improve the crash performance of the bridge barrier railing systems while maintaining the safety walk.

At DOTD's discretion, a full-scale crash test may be performed with a chosen barrier railing system.

IMPLEMENTATION POTENTIAL

The research team will design crashworthy retrofit structural details for any bridge barrier railing system that requires modification in order to meet MASH specifications. These details will be ready for immediate implementation by the DOTD.



Section view of post and beam bridge rail