

RESEARCH NOTES

Program Steering Committee (PSC): Design/Construction

June 2014

Title: Development of Aesthetic, Low-Maintenance Guardrail System Alternatives

Task Number: 0918

Start Date: August 1, 2005

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Product Category: New or improved tool or equipment (Primary), new or improved technical standard, plan, or specification (Secondary)

Task Manager:

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PROJECT TITLE:

Aesthetic, Low-Maintenance Guardrail System for Rural Areas

Development of Aesthetic, Low-Maintenance Guardrail System Alternatives

WHAT IS THE NEED?

Many rural agencies are demanding that the California Department of Transportation build highway projects that include roadside barriers with an aesthetic appearance, which standard W-beam guardrail does not provide. Some highway construction projects are delayed because the barriers do not present an aesthetically acceptable appearance. There are only a limited number of National Cooperative Highway Research Program (NCHRP) Report 350 (previous crash testing guidelines) and Manual for Assessing Safety Hardware (MASH) (current crash testing guidelines) Test Level 3 (TL-3) compliant aesthetic barriers, but most are proprietary, expensive to build and expensive to maintain.

WHAT ARE WE DOING?

In order to provide a range of new barrier alternatives for guardrail applications, a concrete foundation was designed to mount different types of bridge rails. This would allow approved bridge rails to be used as guardrail systems. Several existing bridge rails are considered aesthetically acceptable. The CA ST-10 bridge rail was chosen as the most conservative system to mount onto the concrete foundation and be tested to the latest federal crash testing guidelines.

WHAT IS OUR GOAL?

The objective of this research is to develop and test new guardrail systems to MASH's TL-3 full scale crash testing guidelines. The system will meet California's needs for an aesthetically acceptable guardrail and be able to sustain vehicular impacts with minimal or no damage. It will have a relatively low life cycle cost, contain a minimum number of parts for reduced maintenance, and be easy to repair or replace if required.

WHAT IS THE BENEFIT?

This research will provide Caltrans with new aesthetic guardrail systems that will meet the demands of many rural agencies, which will decrease project delays due to aesthetics. Also, the new systems will require less maintenance than W-beam guardrail which will lower risk to maintenance crews and lower down time on roadways due to repair work.

WHAT IS THE PROGRESS TO DATE?

On October 16, 2013 a full scale crash test was conducted on a CA ST-10 bridge rail mounted onto a 30 inch (762 mm) deep by 20 inch (508 mm) wide concrete trench footing foundation. The test ultimately failed due to the vehicle rolling on to its side. Although this combination failed MASH's evaluation criteria, the trench footing reacted as designed. Therefore, many bridge rail barriers can be mounted onto the concrete foundation. The final report is currently being drafted.

IMAGES

