Develop MASH Bridge Railing that Satisfies State and Federal Historical Preservation Requirements

Develop a MASH 2016 compliant TL-4 bridge railing to replace existing concrete baluster bridge railings on rehabilitation and replacement projects for California bridges on the State and National Historic Registers.

WHAT IS THE NEED?

There are many bridges within the State of California and National Historic Register that were built with an aesthetically pleasing concrete baluster rail which does not meet the Manual for Assessing Safety Hardware (MASH) 2016 standards. There is a need to design and develop an alternative historic appearing rail (Type 86H) that is capable of handling MASH 2016 TL-4 impact loads and meet current MASH crash testing guidelines.

There is also a need to replace existing concrete baluster bridge railings on rehabilitation and replacement projects for California bridges on the State and National Historic Registers. The process will likely require a preliminary investigation, review of state and federal requirements for historic structures, analysis, design, crash testing, stakeholder review, and publication of revised standards.

WHAT ARE WE DOING?

The California Department of Transportation (Caltrans) Division of Engineering Services has completed the design of the Type 86H rail that is structurally capable of handling MASH 2016 TL-4 impact loads. A Minor B contract will be used for construction of the Type 86H rail at the Caltrans Dynamic Test Facility and will be overseen by Caltrans staff.

Once built, the test article will be crash tested to MASH 2016. The test results will be presented to Division of Engineering Services to determine if the Type 86H can be adopted as an alternative barrier rail for use by Caltrans.
WHAT IS OUR GOAL?

The goal is to design, construct, crash test and obtain approval for a MASH TL-4 compliant bridge rail that supports environmental and cultural requirements for historic structures.

WHAT IS THE BENEFIT?

The project will provide a bridge rail that meets federal safety requirements for use on state historic bridges and will be eligible for Federal-aid reimbursement. In addition, it will reduce delays of project delivery for upgrading and repairing state historic bridges.

WHAT IS THE PROGRESS TO DATE?

The Type 86H bridge rail has been designed by Structures. A minor B contract package for construction of the test article has been awarded and executed by Caltrans Division of Procurement and Contracts. Work began at the Caltrans Dynamic Test Facility on November 2, 2020 and was completed on January 11th, 2021. Both the 2270P (pickup) and 10000S (Single-Unit Truck) test vehicle Purchase Orders were executed and we have received the vehicles. The 1100C (Passenger Car) crash test was completed on May 26th, 2021 and the results are pending.

IMAGES

Image 1: Type 86H Cross Section Detail

Image 2: Type 86H Concrete Barrier looking North East

Image 3: Type 86H Concrete Barrier looking North West

Image 4: Type 86H Concrete Barrier looking North