

Memorandum

*Making Conservation
a California Way of Life*

To: STRUCTURE POLICY BOARD

Date: August 2, 2019

From: RUTH FERNANDES *RF*
State Bridge Engineer (Acting)
Division of Engineering Services

Subject: **INTERIM TYPE SELECTION GUIDELINES FOR BRIDGE RAILINGS IN CALIFORNIA**

On December 22, 2015, the Federal Highway Administration (FHWA) and the American Association of State Highway and Transportation Officials (AASHTO) jointly released a memo approving a schedule for compliance with the Manual for Assessing Safety Hardware (MASH) for roadside safety hardware devices.

On December 23, 2016, Caltrans adopted an implementation schedule whereby bridge railings on projects on the State Highway System advertised on or after October 31, 2019, must comply with MASH criteria for all new permanent installations and full replacements.

Attachment 2 includes information on Caltrans' Division of Engineering Services (DES) MASH implementation plan for bridge railings revised July 2019.

Under MASH, the minimum height for bridge railings is increasing from 32 inches to 36 inches above the roadway for vehicular traffic railings for Test Level 4 locations. For Test Level 2 locations, the minimum railing height is increasing from 27 inches to 32 inches above the roadway for vehicular traffic railings and above the top of the walkway for combination railings.

The following type selection guidelines shown in the tables are recommended for projects with bridge railings in the planning and design phases. These guidelines will ensure adequate deck width and railing height during the transition to MASH approved systems.

Test Level 4 Locations (TL-4, speed greater than 45 mph):

Railing Type	Minimum Deck Width	Railing (MASH Compliant or Interim)	Avoid
Solid concrete parapet	1 foot-9 inches	<i>MASH Compliant</i> Concrete Barrier Type 836 (h = 36 inches) Concrete Barrier Type 842 (h = 42 inches)	Concrete Barrier Type 732, 736 & 742 (h = 32 inches, h = 36 inches, & h = 42 inches respectively)
Concrete parapet and metal rail	2 feet	<i>Interim</i> Concrete Barrier Type 90 (h=36 inches)	--
Post and Beam-steel	2 feet	<i>Interim</i> California ST-70 Bridge Rail (h = 46 ½ inches) California ST-20S Bridge Rail (h = 46 ½ inches) (bicycle h = 54 inches)	California ST-10 Bridge Rail (h=33 inches) California ST-30 Bridge Rail (h=32 inches)
Post and Beam-steel (side-mount)	N/A	<i>MASH Compliant</i> California ST-70SM Bridge Rail (h = 42 inches)	--
Post and Beam-concrete	2 feet	<i>Interim</i> Concrete Barrier Type 80 (h = 32 inches)	--

All Test Level 4 Rail systems listed above are adequate for Test Level 2 applications.

Railing Type	Minimum Deck Width	Railing (MASH Compliant or Interim)
Solid concrete parapet with sidewalk	1 foot plus 6 feet-2 inches minimum	<i>MASH Compliant</i> Concrete Barrier Type 732SW (h = 32 inches above sidewalk)
Post and Beam – concrete with sidewalk	2 feet plus 6 feet-2 inches minimum	<i>Interim</i> Concrete Barrier Type 80SW (h = 32 inches above sidewalk)
Post and Beam – steel with sidewalk	2 feet plus 6 feet-2 inches minimum	<i>Interim</i> California ST-40 Bridge Rail (h = 42 inches above sidewalk)

If a bridge rail currently under development is not available for use until after RTL but before Bid Opening, follow normal project addendum processes to revise the plans to include the new MASH-compliant bridge rail. If the bridge rail under development gets approved after Bid Opening, follow normal project change

order processes to include the new MASH-compliant barrier on the project.

Please revise your internal business practices to include the Bridge Railing Specialists in the transmittal of Type Selection, General Plans. It's strongly recommended to get the Bridge Railing Specialists involved in bridge railing issues as early as possible in a project, and any time there is a change to the bridge railing type or a proposed bridge railing modification.

For questions, please contact Joel Magaña at (916) 227-8018 or by email <desdesign@dot.ca.gov>.

Attachments

1. "Implementation of the Manual for Assessing Safety Hardware" Memo, dated 12/23/2016
2. "MASH Implementation for California Bridge Railings" table, dated July 2019

c: Joel Magaña, Chief, Office of Design and Technical Services

Bridge Design Office Chiefs

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