

BRIDGE DESIGN BULLETIN 2020-1

TO: All Bridge Designers

FROM: David L. Eberhart, P.E.
State Bridge Engineer

CC: Chad Matty (Federal Highway Administration)

DATE: January 15, 2020

RE: ADOT MASH Compliant Bridge Railings

Purpose

The purpose of this memorandum is to inform all designers that the new ADOT Standard Drawings for MASH compliant bridge railings have been updated on the Bridge Group website. Also, the 1D sheet has been updated to reflect the changes to the SD 1 Railings Standard Drawings.

Implementation

All permanent bridge rails and transitions included on ADOT projects advertised after January 1st, 2020 must be Manual for Assessing Safety Hardware (MASH) compliant. The new SD 1 Railings series Standard Drawings are:

SD 1.10-1	38" Single Slope Bridge Concrete Barrier and Transition (1 of 2)
SD 1.10-2	38" Single Slope Bridge Concrete Barrier and Transition (2 of 2)
SD 1.11-1	42" Single Slope Bridge Concrete Barrier and Transition (1 of 2)
SD 1.11-2	42" Single Slope Bridge Concrete Barrier and Transition (2 of 2)
SD 1.12	Combination Pedestrian-Traffic Bridge Railing
SD 1.13	Pedestrian Fence for Bridge Railing SD 1.12
SD 1.20	32" Type F Roadway Barrier Transition to 38" Single Slope Bridge Barrier
SD 1.21	32" Type F Roadway Barrier Transition to 42" Single Slope Bridge Barrier
SD 1.22	42" Type F Roadway Barrier Transition to 42" Single Slope Bridge Barrier
SD 1.30	Barrier Junction Box

Bid item numbers for the new SD 1 Railings series Standard Drawings are:

- 6011150 38" Single Slope Bridge Concrete Barrier and Transition
- 6011151 42" Single Slope Bridge Concrete Barrier and Transition
- 6011132 Combination Pedestrian-Traffic Bridge Railing
- 6011142 32" Type F Roadway Barrier Transition to 38" Single Slope Bridge Barrier
- 6011143 32" Type F Roadway Barrier Transition to 42" Single Slope Bridge Barrier
- 6011144 42" Type F Roadway Barrier Transition to 42" Single Slope Bridge Barrier
- 7320475 Barrier Junction Box Type I
- 7320476 Barrier Junction Box Type II

Click on the link below to access SD 1 Railings Standard Drawings:

<https://azdot.gov/business/engineering-and-construction/bridge/structure-detail-drawings/sd-1-railings>

Click on the link below to access ADOT Bridge Railing Standard Drawings that have been archived:

<https://azdot.gov/business/engineering-and-construction/bridge/structure-detail-drawings/historical-standards>

Design Loads:

Dynamic Load (For barrier Design) = 80 kips for TL-4

Dynamic Load (For barrier Design) = 160 kips for TL-5

Equivalent Static Load (For footing design) = 28 kips

Barrier Type	Mb	Rw	Mc	Mw	Top rail Mp	Bottom rail Mp	Post Mp
38" Single Slope Barrier	0	97.38 kips	11.29 ^a	35.18	--	--	--
42" Single Slope Barrier	0	205.6 kips	18.65 ^b	78.13	--	--	--
Combination Pedestrian-Traffic Bridge Railing ^c	0	-	12.69 ^d	57.40 ^e	9.80	9.80 ^f	15.03

- a. Mc = 18.10 at open joints
- b. Mc = 19.17 at open joints
- c. Assume 10 inch curb height at parapet
- d. Mc = 15.39 at open joints
- e. Mw = 47.70 at open joints
- f. When fence is omitted

Plastic moment accounts for bolt holes in post and railing