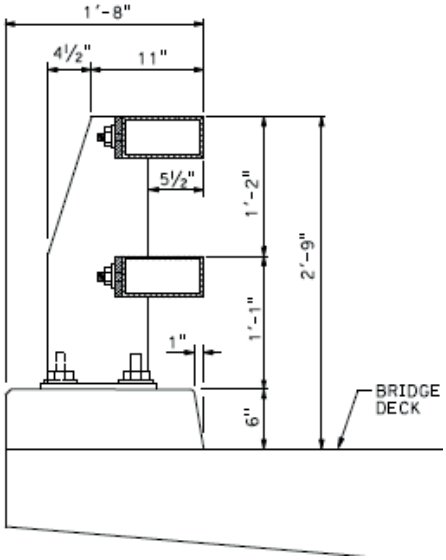
Systems with a TL-4 Crash Test Rating

These railings are approved for use in California in a high-speed location (regulatory speed limit of greater than 45 miles per hour) or a low speed location (regulatory speed limit of 45 miles per hour or less).

See the Caltrans Standard Plans and the Caltrans Bridge Standard Details for complete plan sheets.

California ST-10 Bridge Rail



Description
NCHRP Report 350

Vehicular Traffic Railing Post and Beam (steel with concrete curb)

Hollow structural section (HSS) with 6-inch height concrete curb.

Height is 2 feet-9 inches

Width is 1 feet-8 inches

Post spacing is 10 feet maximum

Modifiable for bicycles.

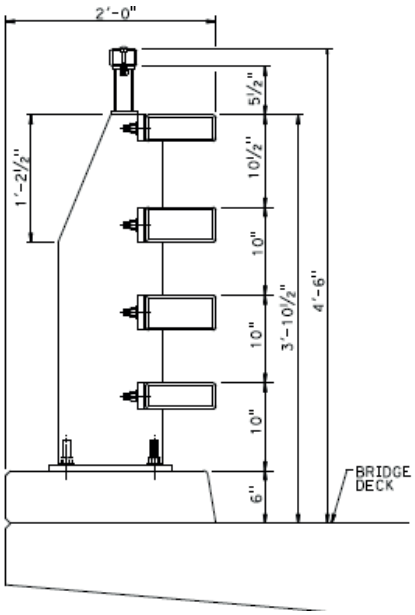
Aesthetic see-through railing

MASH Strategy
No replacement planned for bridge rails less than 3 feet in height. All current steel post and beam rails will be replaced by proposed MASH compliant ST-75.

Do not use ST-10 next to high speed traffic where high-speed means speed greater than 45 miles per hour.

Obsolete after October 31, 2019

California ST-20S Bridge Rail



Description
NCHRP Report 350

Combination Traffic Railing (vehicular and bicycle with modification of lowermost clear opening)

Post and beam (steel with concrete curb)

Hollow structural section (HSS) with 6 inches concrete curb.

Height is 3 feet-10 ½ inches vehicular railing height, 4 feet-6 inches bicycle railing height.

Width is 2 feet

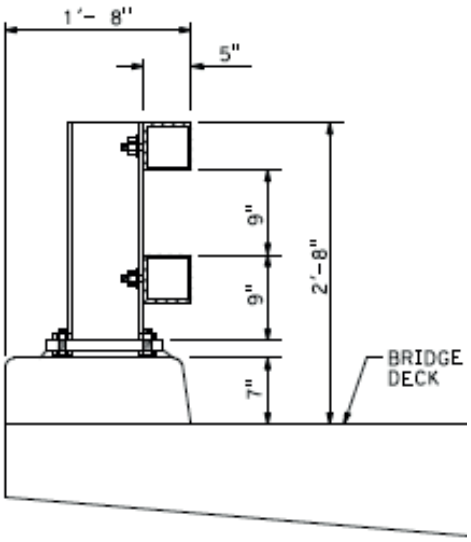
Post spacing is 10 feet maximum

Aesthetic see-through railing.

MASH Strategy
ST-20S (Standard Plans B11-71, 72, 73, and 74) will be replaced by proposed MASH compliant California ST-75 Bridge Rail.

Obsolete after October 31, 2019

California ST-30 Bridge Rail



Description
NCHRP Report 350

Vehicular Traffic Railing Post and Beam (concrete curb and metal)

Hollow structural section (HSS) with 7-inch height concrete curb

Height is 2 feet-8 inches

Width is 1 foot-8 inches

Post spacing is 10 feet maximum

Modifiable for bicycles

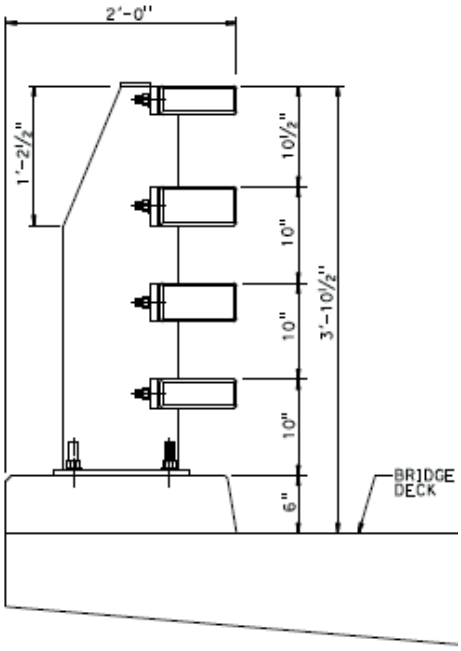
Aesthetic see-through rail

MASH Strategy
No replacement planned for bridge rails less than 36 inches in height. All current steel post and beam rails will be replaced by proposed MASH compliant ST-75.

Do not use ST-30 next to high speed traffic where high speed means greater than 45 miles per hour.

Obsolete after October 31, 2019

California ST-70 Bridge Rail



Description
NCHRP Report 350

Combination Traffic Railing (vehicular & bicycle with modification of lowermost clear opening)

Post and beam (concrete curb and metal)

Hollow Structural Section (HSS) with 6-inch height concrete curb.

Height is 3 feet-10 ½ inches

Width is 2 feet

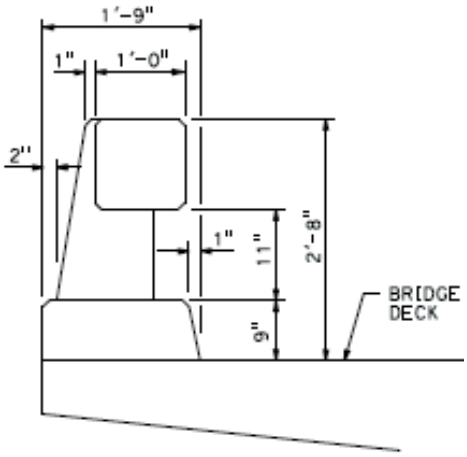
Post spacing is 10 feet maximum

Aesthetic see-through rail

MASH Strategy
ST-70 (Standard Plans B11-75, 76, 77, and 78) will be replaced by proposed MASH compliant California ST-75 Bridge Rail

Obsolete after October 31, 2019

Concrete Barrier Type 80



Description
NCHRP Report 350

Vehicular Traffic Railing

Post and beam (concrete)

Concrete with 9 inches curb

Height is 2 feet-8 inches

Width is 1 feet-9 inches.

Post spacing is 6 feet-6 inches maximum

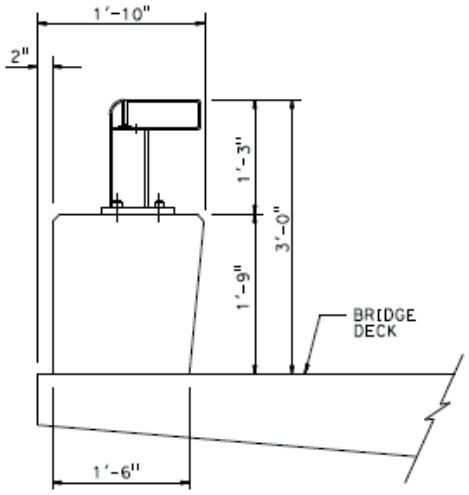
Modifiable for bicycles

Aesthetic see-through rail

MASH Implementation
Type 80 (Standard Plans B11-60 and B11-61) will be replaced by proposed MASH compliant Concrete Barrier Type 85.

Obsolete after October 31, 2019

Concrete Barrier Type 90



Description
NCHRP Report 350

Vehicular Traffic Railing

Concrete parapet and metal rail

Height is 3 feet

Width is 1 foot-8 inches plus 2 inches clear to edge of deck

Post spacing is 10 feet maximum

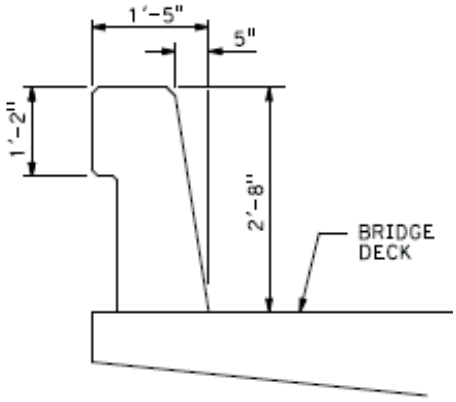
Modifiable for bicycles

Aesthetic see-through rail

MASH Strategy
No replacement planned for Type 90 (Bridge Standard Details Sheets xs16-050-1, 2, and 3).

Obsolete after October 31, 2019

Concrete Barrier Type 732



Description

NCHRP Report 350 compliant Vehicular Traffic Railing

Solid concrete barrier

Height is 2 feet 8 inches

Width is 1 foot 5 inches

Modifiable for bicycles

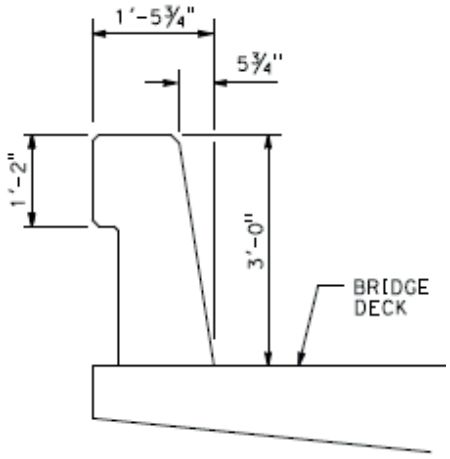
MASH Strategy

No replacement planned for bridge rails less than 36 inches in height.

2018 Standard Plan B11-55 was cancelled on April 19, 2019.

Type 732 was replaced by MASH compliant Concrete Barrier Type 836

Concrete Barrier Type 736



Description
NCHRP Report 350 compliant Vehicular Traffic Barrier

Solid concrete barrier

Height is 36 inches

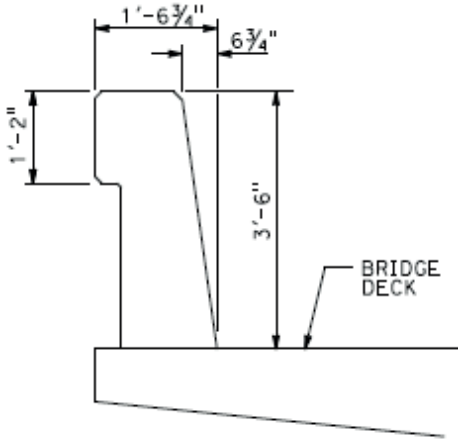
Width is 1 foot-5 ¾ inches

Modifiable for bicycles

MASH Strategy
Type 736 (Standard Plan B11-56) was cancelled from 2018 Standard Plans on October 19, 2018.

Type 736 was replaced by MASH compliant Concrete Barrier Type 836

Concrete Barrier Type 742



Description

NCHRP Report 350 Combination Traffic Barrier (vehicular & bicycle)

Solid concrete barrier

Height is 42 inches

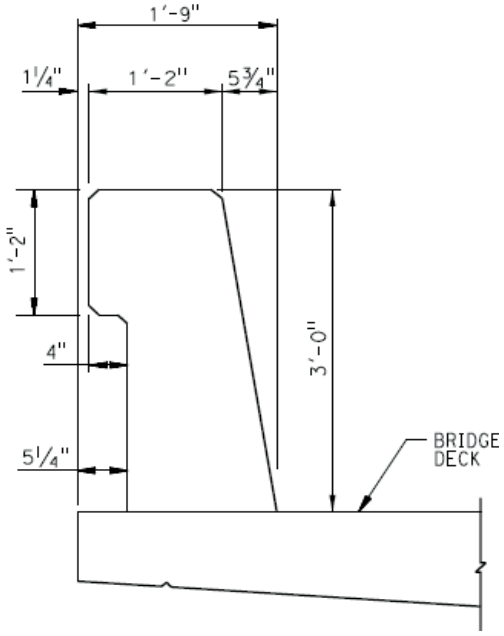
Width is 1 foot-6 ¾ inches

MASH Strategy

Type 742 (Standard Plan B11-57) was cancelled from 2018 Standard Plans on October 19, 2018

Type 742 was replaced by MASH compliant Concrete Barrier Type 842

Concrete Barrier Type 836



Description
MASH compliant Vehicular Traffic Railing

Solid concrete barrier

Height is 3 feet

Width is 1 feet-9 inches

Modifiable for bicycles

FHWA requires 36 inches minimum height for traffic barriers next to high speed traffic where high-speed means speed greater than the 45 miles per hour, but if future overlay is anticipated Concrete Barrier Type 842 must be used.

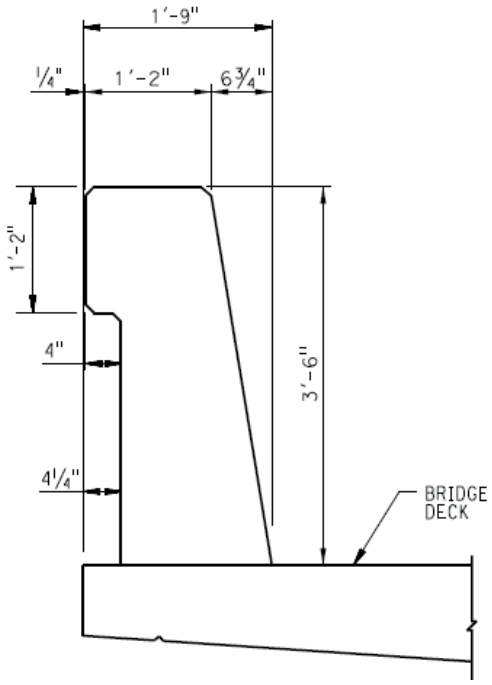
MASH Strategy
Type 836 replaces Types 732 & 736.

Originally approved for use and posted to Bridge Standard Detail Sheets in mid-January 2018.

Concrete Barrier Type 836 was elevated from Bridge Standard Detail Sheets to the Caltrans Standard Plans 2018 on October 19, 2018.

Caltrans Standard Plans 2018 RSP B11-79 and 80

Concrete Barrier Type 842



Description
MASH compliant Vehicular Traffic Railing

Solid concrete barrier.

Height is 3 feet-6 inches

Width is 1 feet-9 inches

Modifiable if need bicycle railing height greater than the minimum bicycle railing height of 3 feet-6 inches.

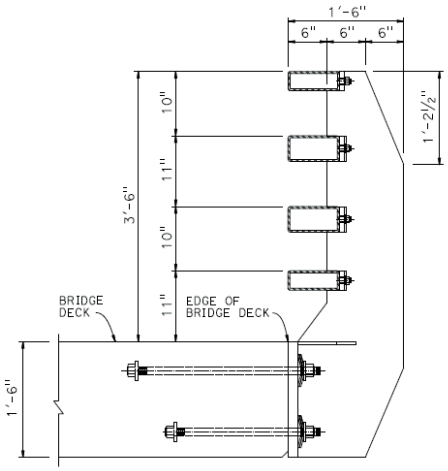
MASH Strategy
Type 842 replaces Type 742.

Originally approved for use and posted to Bridge Standard Detail Sheets in mid-January 2018.

Concrete Barrier Type 842 was elevated from Bridge Standard Detail Sheets to the Caltrans Standard Plans 2018 on October 19, 2018.

Caltrans Standard Plans 2018 RSP B11-81 and 82

California ST-70SM Bridge Rail



Description

MASH compliant Combination Traffic Railing (vehicular and bicycle with modification of 2 of 4 clear openings)

Post and beam (all metal)

Hollow structural section (HSS) side-mounted (no curb)

Height is 3 feet-6 inches

Width is 1 foot-6 inches (beyond Edge of Deck, EOD)

Post spacing is 10 feet

Aesthetic see-through rail

Can be used where there are right of way issues or other limitations.

MASH Strategy

ST-70SM is a new Side Mounted Bridge Rail (There were no approved NCHRP Report 350 compliant Side Mounted Bridge Rails.)

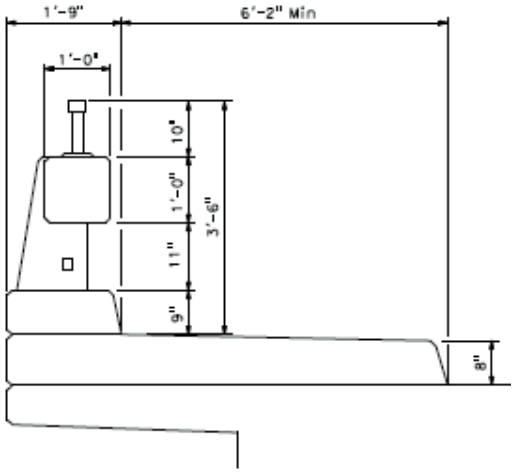
ST-70SM approved for use on California Highways and posted to the Bridge Standard Detail Sheets (xs16-115-1, 2, 3, and 4) on January 25, 2019.

Systems with a TL-2 Crash Test Rating

These railings are approved for use in California in a low speed location only (regulatory speed limit of 45 mph or less).

See the Caltrans Standard Plans and the Caltrans Bridge Standard Details for complete plan sheets.

Concrete Barrier Type 80SW



Description

NCHRP Report 350 compliant

Combination Traffic Railing (vehicular and pedestrian)

Post and beam (concrete).

Concrete with tubular hand rail, 8 inches curb and integral raised sidewalk.

Height = 32 inches above top of sidewalk plus tubular hand railing (minimum 42 inches height above top of sidewalk) mounted on top of concrete parapet.

Width is 1 feet-9 inches parapet width plus minimum 6 feet-2 inches sidewalk width

Post spacing is 6 feet-8 inches maximum

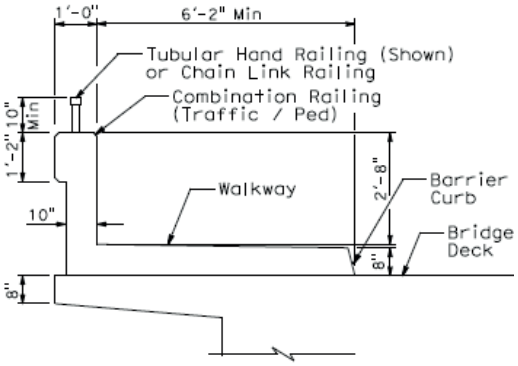
Aesthetic see-through rail

MASH Strategy

Type 80SW (Standard Plans B11-62, B11-63, and B11-64) will be replaced by proposed MASH compliant Concrete Barrier Type 85SW

Obsolete after October 31, 2019

Concrete Barrier Type 732SW



Description
MASH compliant

Combination Traffic Railing (vehicular and pedestrian)

Solid concrete rail with tubular hand railing or chain link railing, 8 inches curb and integral raised sidewalk.

Height is 32 inches above top of sidewalk plus tubular hand railing (minimum 42 inches above top of sidewalk) or chain link railing mounted on top of concrete parapet

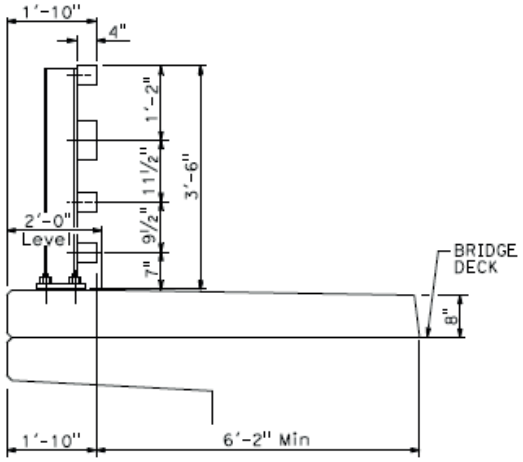
Width is 1-foot parapet width plus minimum 6 feet-2 inches sidewalk width

MASH Strategy
Concrete Barrier Type 732SW replaced NCHRP Report 350 compliant Concrete Barrier Type 26.

Added to Caltrans Standard Plans 2010 and 2015 on January 20, 2017 as RSP B11-58 and RSP B11-59 (cancelled Concrete Barrier Type 26 on same date).

Caltrans Standard Plans 2018 B11-58 and B11-59

California ST-40 Bridge Rail



Description
NCHRP Report 350 compliant

Combination Traffic Railing (vehicular and pedestrian)

Post and beam (steel) on concrete sidewalk.

Hollow Structural Section (HSS) with 8” concrete curb and integral raised sidewalk

Height is 42 inches above top of sidewalk

Width is 1 foot-10 inches parapet width plus minimum 6 feet-2 inches sidewalk width

Post spacing is 8 feet maximum

Aesthetic see-through rail

MASH Strategy
ST-40 (Standard Plan B11-66 and B11-67) will be replaced by proposed MASH-compliant California ST-75SW Bridge Rail.

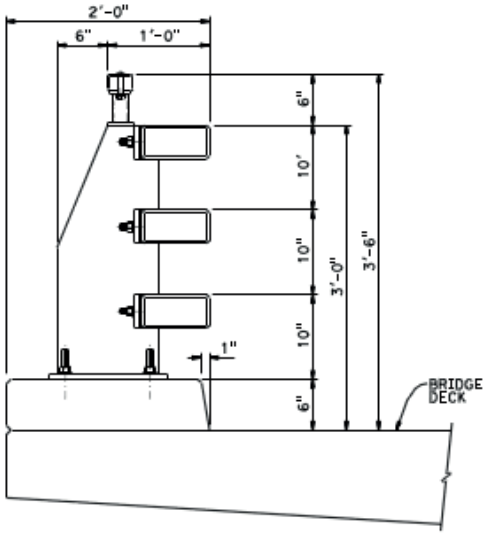
Obsolete after October 31, 2019

Systems under development

These railing systems are currently under development for use in California.

See the Office of Safety Innovation and Cooperative Research website in the Division of Research, Innovation and System Information for more information.

California ST-75 Bridge Rail



Description

MASH TL-4

Combination Traffic Railing (vehicular and bicycle)

Post and beam (steel with concrete curb)

Hollow structural section (HSS) with 6-inch concrete curb

Height is 36 inches vehicular railing height, 42 inches bicycle railing height

Width is 2 feet

Post spacing is 10 feet

Aesthetic see-through rail

MASH Strategy

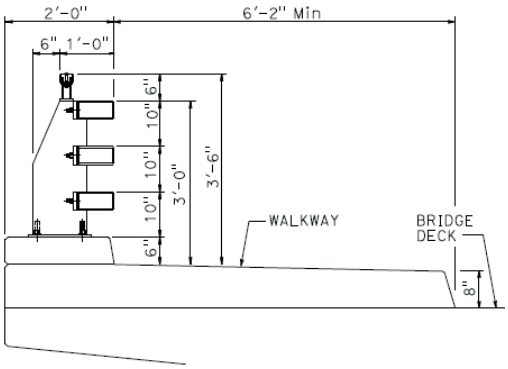
Caltrans research project for 36" vehicular bridge rail and 42" combination bridge rail.

Approval and posting anticipated for late October 2019.

Use is pending successful MASH crash test completion.

ST-75 will replace the NCHRP Report 350 compliant ST-10, ST-30, ST-70, and ST-20S.

California ST-75SW Bridge Rail



Description
MASH TL-2

Combination Traffic Railing (vehicular and pedestrian)

Post and beam (steel with concrete curb on sidewalk)

Hollow structural section (HSS) with 6 inches concrete curb over sidewalk.

Geometric data from bottom of curb and above matches Type 75. The only new feature is the sidewalk.

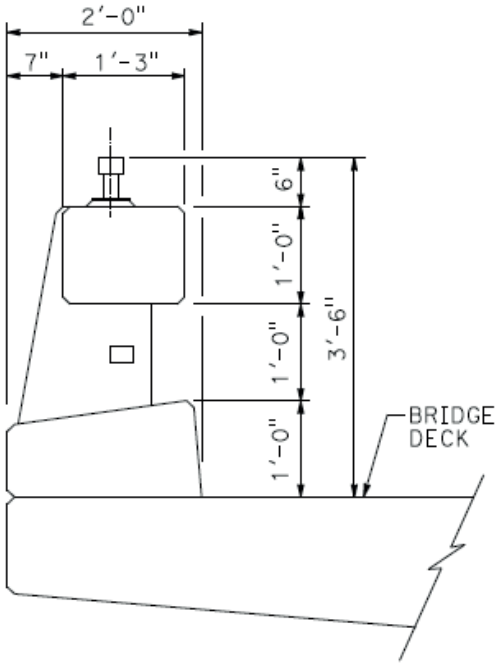
8 inches sidewalk height at curb face and sidewalk slopes at 1.5% upward toward edge of deck for a minimum width of 6 feet-2 inches

MASH Strategy
Approval and posting anticipated for late October 2019.

Use with raised integral sidewalk is pending successful MASH crash test completion of CA ST-75 without a sidewalk at TL-4.

ST-75SW will replace the NCHRP Report 350 compliant ST-40.

Concrete Barrier Type 85



Description
MASH TL-4

Combination Traffic Railing (vehicular and bicycle)

Post and beam (concrete)

Concrete with curb that transitions in height front-to-back from 12 inches to 9 inches

Height is 36 inches vehicular railing height, 42 inches bicycle railing height

Width is 2 feet

Post spacing is 10 feet maximum

Height and clear openings conform to requirements for bicyclists.

Aesthetic see-through rail

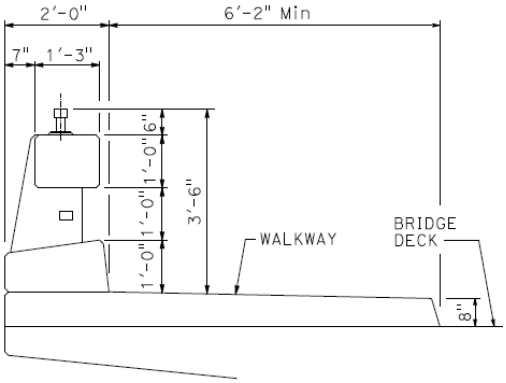
MASH Strategy
Caltrans research project for 36 inches vehicular bridge rail and 42 inches combination bridge rail.

Approval and posting anticipated for mid-July 2020.

Use is pending successful MASH crash test completion.

Type 85 will replace NCHRP Report 350 compliant Type 80.

Concrete Barrier Type 85SW



Description
MASH TL-2

Combination Traffic Railing (vehicular and pedestrian)

Post and beam (concrete)

Concrete with curb that transitions in height front-to-back from 12-inches to 9-inches on top of raised integral sidewalk.

Geometric data from bottom of curb and above matches Type 85. The only additional feature is the raised integral sidewalk.

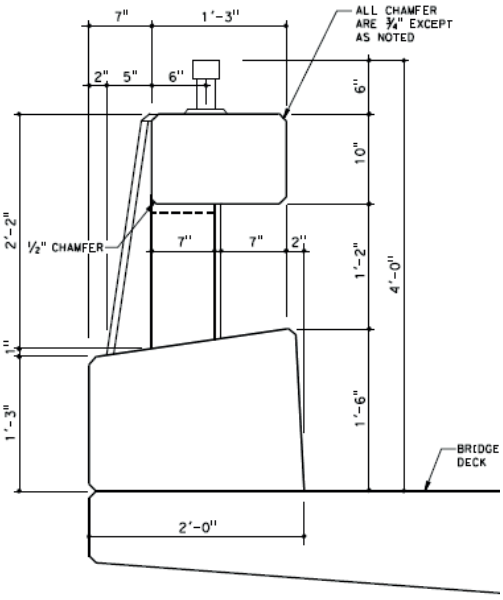
8-inch sidewalk height at curb face and sidewalk slopes at 1.5% upward toward edge of deck for a minimum width of 6 feet-2inches.

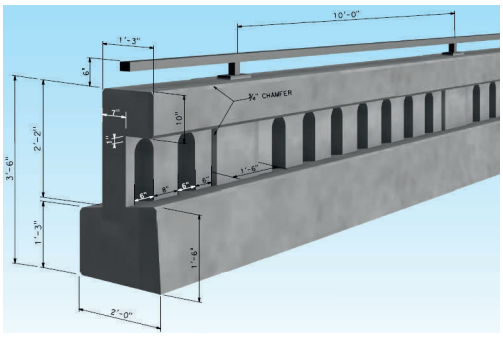
MASH Strategy
Approval and posting anticipated for mid-July 2020.

Use with sidewalk is pending successful MASH crash test completion of CA ST-85 without a sidewalk at TL-4.

Type 85SW will replace the NCHRP Report 350 compliant Type 80SW.

Concrete Barrier Type 86H





Description
MASH TL-4

Combination Traffic Railing (vehicular & bicycle)

Post and beam (concrete with concrete balusters between main posts)

Concrete with curb or lower beam that transitions in height front-to-back from 18-inches to 15-inches

Height is 42-inches vehicular railing height, 48-inches bicycle railing height

Width is 2 feet

Post spacing is 10 feet maximum

Height and clear openings conform to requirements for bicyclists (with or without bike railing on top).

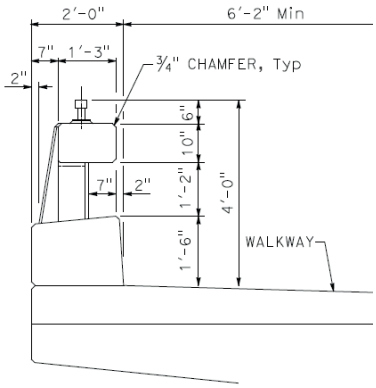
Aesthetic see-through rail version to mimic historic concrete baluster bridge rails for SHPO compliance.

MASH Strategy
Approval and posting anticipated for mid-July 2022.

Use is pending successful crash test completion.

There is no comparable NCHRP Report 350 bridge rail that the Type 86H replaces. Existing concrete baluster bridge rails around the State were constructed between 1900 and 1966, the majority of which are 42 inches height.

California ST-86HSW



Description
MASH TL-2

Combination Traffic Railing (vehicular and pedestrian)

Post and beam (concrete)

Concrete parapet with curb that transitions in height front-to-back from 18-inches to 15-inches

Vehicular railing height is 42-inch above top of sidewalk and meets 48-inch height pedestrian hand railing

8-inch sidewalk height at curb face and sidewalk slopes at 1.5%

Minimum width is 8 feet-2 inches

Post spacing is 10-feet

Railing conforms to requirements for pedestrians

Aesthetic see-through rail

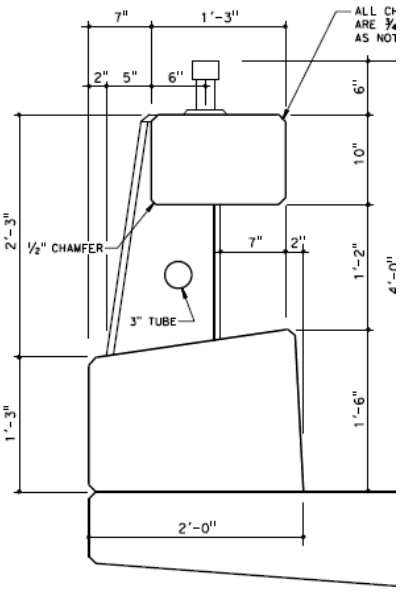
The only changed feature from the Type 86H is the raised integral sidewalk.

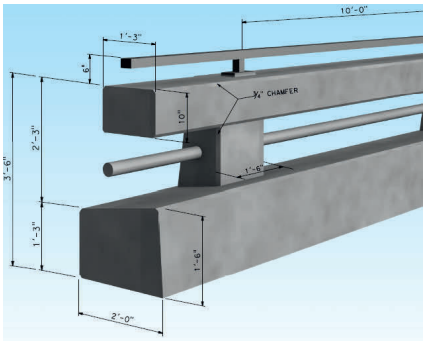
MASH Strategy
Approval and posting anticipated for mid-July 2022.

Use with sidewalk is pending successful crash test completion of CA ST-86H without a sidewalk at TL-4.

There is no comparable height NCHRP Report 350 bridge rail that the Type 86HSW replaces. Existing concrete baluster bridge rails on raised integral sidewalk around the State were constructed between 1900 and 1966, the majority of which are 42-inch height above top of sidewalk.

Concrete Barrier Type 86





Description
MASH TL-4

Combination Traffic Railing (vehicular and bicycle)

Post and beam (concrete)

Concrete with curb that transitions in height front-to-back from 18-inches to 15-inches

Post spacing is 10-feet maximum

Height is 3 feet-6 inches vehicular railing height

Height of pedestrian tubular hand railing is 4-feet.

8-inch sidewalk height at curb face and sidewalk slopes at 1.5% upward toward edge of deck.

Railing conforms to requirements for bicyclists (with or without bike railing on top).

Aesthetic see-through rail version to complement the 36-inch vehicular rail height with 42-inch bicycle railing height Concrete Barrier Type 85.

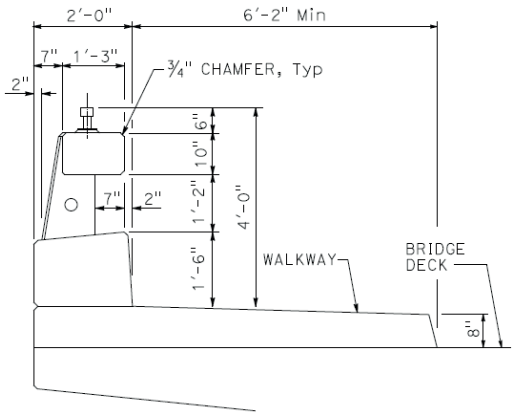
MASH Strategy
Caltrans research project for 42-inch vehicular bridge rail, and 48-inches combination bridge rail (vehicular and bicycle).

Approval and posting anticipated for mid-July 2022.

Use is pending successful crash test completion.

There is no comparable height NCHRP Report 350 bridge rail that the Type 86 replaces.

Concrete Barrier Type 86SW



Description
MASH TL-2

Combination Traffic Railing (vehicular and pedestrian)

Post and beam (concrete)

Concrete parapet with curb/lower beam that transitions in height front-to-back from 18-inches to 15-inches on top of raised integral sidewalk.

Height is 3 feet-6 inches vehicular railing height above top of sidewalk. Height of pedestrian tubular hand railing is 4 feet-0 inches (note that this height is 6-inches higher than the minimum height above top of sidewalk which is 3 feet-6 inches). 8-inch sidewalk height at curb face and sidewalk slopes at 1.5% upward toward edge of deck.

MASH Strategy
Caltrans research project for 42 inches vehicular bridge rail, and 48 inches combination bridge rail (vehicular and pedestrian).

Approval and posting anticipated for mid-July 2022.

Use with sidewalk is pending successful crash test completion of CA ST-86 without a sidewalk at TL-4.