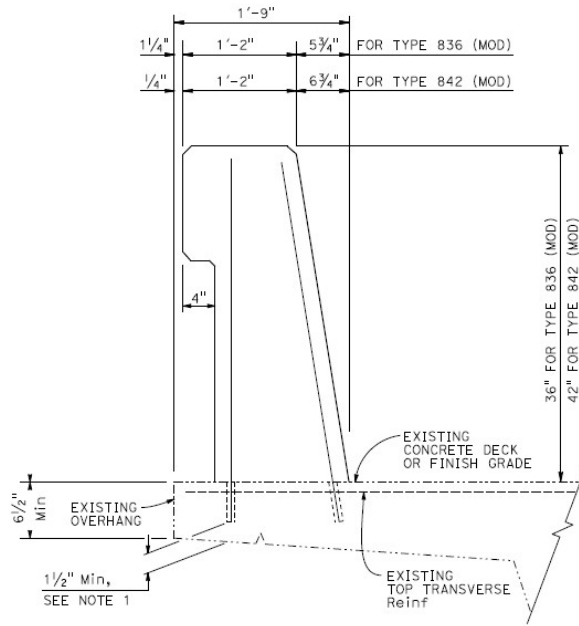




# User Guide to Bridge Standard Detail Sheets Section 16 – Barriers & Railings Concrete Barrier Type 836/842 Retrofit

Bridge Standard Detail Sheet (XS) Number  
xs16-045

## Description of Component

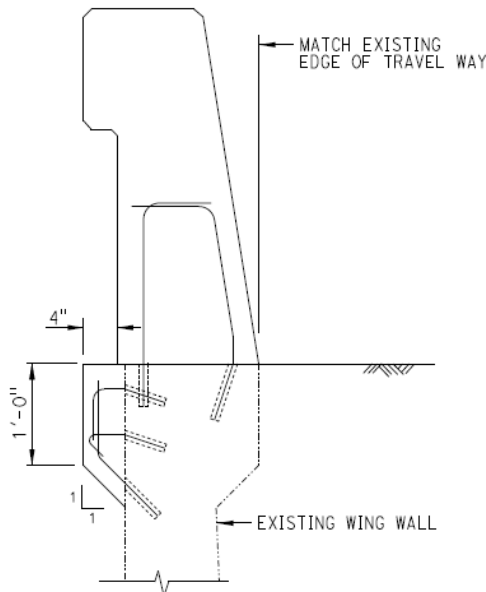


TL-4 rating, applicable for high speed locations, greater than 45 mph.

Height = 36 inch for Type 836 (Mod) and 42 inch for Type 842 (Mod)

Box Girder Bridge Deck Overhang Shown, Slab Bridge Deck Similar.

## Type 836 (Mod) or 842 (Mod) on overhang



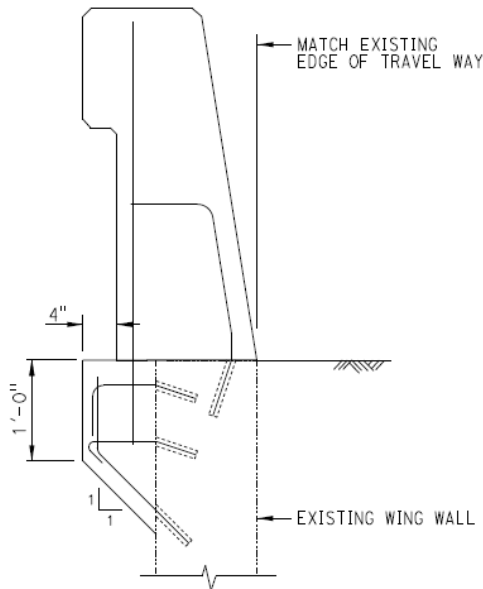
Concrete Barrier Type 842A (Mod) retrofit on existing wingwall OPTION 1 is shown, Concrete Barrier Type 836A (Mod) retrofit on existing wingwall OPTION 1 is similar.

Note: Edge of Travel Way is shown, Edge of Shoulder (ES) is similar.

## Type 842A (Mod) – Option 1



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Concrete Barrier Type 842A (Mod) retrofit on existing wingwall OPTION 2 is shown, Concrete Barrier Type 836A (Mod) retrofit on existing wingwall OPTION 2 is similar.

Note: Edge of Travel Way is shown, Edge of Shoulder (ES) is similar.

Type 842A (Mod) – Option 2

## Standard Drawing Features

- Notes
- Type 842 (Mod)
- Type 842A (Mod), Option 1
- Type 842A (Mod), Option 2
- Pedestal Elevation

## Design Notes / Plan Sheet Details

Design Tools for Designers:

AASHTO LRFD Bridge Design Specifications, 8th Edition with California Amendments. 54kip maximum traffic impact distributed over  $L_t = 3.5$  feet at the top of the barrier, which results in the following values for  $L_c$  at the deck overhang condition as shown in Table 1 below.

Table 1 - Critical Length of Yield Line Failure Pattern  $L_c$

Barrier Type	$L_c$ Interior Segment *	$L_c$ Near Joint Segment**
Type 836	15.0 feet	6.7 feet
Type 842	15.7 feet	6.9 feet



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Load Combinations and  $L_c$  on the plan sheet are given for barrier attachments to existing bridge overhang only.

\* Interior segment at least  $L_c$  away from deck joint,

\*\* Near joint segment within  $L_c$  from deck joint.

## Reinforced Concrete Strengths for New and Existing Concrete

New Concrete	Existing Concrete
$f'_c = 3.6$ ksi $f_y = 60$ ksi	$f'_{ce} = 4.0$ ksi $f_y =$ See As-Builts

Designer must verify the following:

1. Designers must ensure that any supporting structures, such as the bridge deck, overhang, wingwall, and /or trench footing meet the requirements in the AASHTO LRFD Bridge Design Specifications and Section 13, Railings, and Appendix A13 and as amended by Caltrans' California Amendments.

There are three overhang design cases per AASHTO LRFD Bridge Design Specifications Appendix A13:

Case1: Extreme Event II (transverse and longitudinal forces)

Case 2: Extreme Event II (vertical forces)

Case 3: Strength I

2. Strength of existing wingwall with barrier attachment and  $L_c$  at wingwall must be verified separately.
3. Minimum dimensions shown on the plans for deck overhang, trench footing depth, trench footing width, and minimum length of trench footing must be met. Designer must replace minimum dimensions by actual dimensions.

For projects located in a corrosive environment, refer to the AASHTO LRFD Bridge Design Specification Section 5.12 for using epoxy coated rebar and Standard Specifications 2015 section 52-2.



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## Additional Drawings Needed to Complete PS&E

1. For details not shown, see RSP B11-79, RSP B11-80, RSP B11-81 & RSP B11-82.  
Dimensions may vary with roadway cross slope and with certain thicknesses of surfacing, See Roadway Plans.
2. For electrolier mounting details, see RSP B11-81, RSP B11-82, ES-6A and ES-6B.
3. If Chain Link Railing (CLR) is required or desired, it will be permissible to be attached to Concrete Barrier Type 836/842 (Mod) retrofit per Standard Plan B11-7.
4. Connection of concrete transition end block to guardrail transitions at approach and departure ends: Standard Plans A78F1 & A78F2 for Thrie Beam Barrier or Standard Plans A77U1 & A77U2 for Midwest Guardrail System (MGS).

If the bridge rail concrete transition end blocks for a project are going to connect to something other than the guardrail transition Standard Plans for either Thrie Beam Barrier guardrail or Midwest Guardrail System, then special designed details will be required.

## Contract Specifications

Caltrans Standard Specifications: Section 51 Concrete Structures, Section 52 Reinforcement, Section 56 Overhead Sign Structures, Standards, and Poles, Section 75 Miscellaneous Metal, Section 83 Railings and Barriers, and Section 59 Painting.

## Restrictions on Use of Standard Drawings

Sound wall cannot be mounted on Concrete Barrier Type 836/842 (Mod) retrofit.  
A TL-4 rated bridge rail can be used in a high speed (greater than 45mph) or low speed location (45mph or less).

## Special Considerations

Future overlays:

The height above Finish Grade for bridge railing at completion of construction contract cannot be less than the heights shown on the Revised Standard Plan sheets for Concrete Barrier Type 836/842. For example: 42-inch height above concrete deck with no overlay, or 42-inch height above the Finish Grade of a polyester concrete overlay.

If an overlay is planned for an existing bridge deck with an existing Type 836/842 Bridge Rail, then consider the following options:



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- No overlay.
- Taper the overlay down to zero or to its minimum depth and stop at least 3 feet – 0 inches away measured transversely from the traffic side toe of the concrete curb of the bridge rail.
- If need overlay to extend all the way to the curb face such as in a marine environment or in snow country where it is needed to seal the deck surface, then taper down the depth of the overlay down to the minimum depth that the type of overlay can be placed, then at that point the deck surface should be removed to an equivalent depth of that minimum overlay thickness in order for the height above Finish Grade to remain the same, so that minimum depth of the overlay can be placed all the way to the toe without reducing the height of the bridge rail measured from the Finish Grade of the overlay (this will minimize the area of deck shoulder that needs some surface removal). If this is not possible, then may have to replace the existing bridge rail in conjunction with an overlay placed all the way to the toe of the bridge rail. Note that if a policy or the existing bridge condition does not permit removing a portion of the top of the bridge deck surface for any specified reason, then the overlay options are limited to either no overlay, or no overlay within 3 feet – 0 inches from the toe of the bridge rail, or overlay all the way to the toe of the bridge rail in conjunction with a bridge rail replacement.
- If the shoulder is narrow which leaves little or no distance to taper down the overlay depth, then choose an overlay material that can be applied in the thinnest possible depth section and only remove the minimum area and minimum depth of deck surface close to the toe of the bridge rail in order to preserve the height of the existing Type 836/842 (Mod) retrofit.

All project-specific modifications to Bridge Standard Details Sheet, XS 16-045, Concrete Barrier Type 836/842 Retrofit must be reviewed by the Bridge Railing Technical Specialist in the Caltrans/Division of Engineering Services/Office of Design and Technical Services. Please contact the [Office of Design and Technical Services](#).