# 9.4 DECK, OVERHANG, AND SOFFIT DESIGN

## 9.4.1 GENERAL

This policy addresses the design of concrete bridge decks, deck overhangs, and soffits for new bridges and bridge widenings.

## 9.4.2 DEFINITIONS

Article - Article in the Caltrans currently adopted *AASHTO LRFD Bridge Design Specifications* and the corresponding *California Amendment*s (AASHTO-CA BDS).

Bay - Area between centerlines of adjacent girders.

Soffit - Bottom slab of box girders

Typical deck - Non-prestressed, normal weight cast-in-place concrete deck slab supported on three or more girders in which the two outermost girders are not less than 14 feet on center, and all girders are 15 feet or less on center; non-prestressed cast-in-place concrete deck slab for single-cell and two-girder widenings when a moment resisting closure pour is used, and the required moment resistance of the bay containing the closure pour does not exceed that of the adjacent bays.

Typical overhang - An overhang supporting solid concrete parapet railings and with a length not greater than the lessor of 6 feet or one-half of the exterior bay-width measured from the centerline of the exterior girder.

## 9.4.3 POLICY

All concrete bridge decks and deck overhangs shall be designed in accordance with AASHTO-CA BDS Articles 9.5 and A13.4 for the service, strength, and extreme event limit states. For typical decks, the moment demands in AASHTO-CA BDS Table A4-1 shall be used. Special loads including but not limited to material hauling equipment, cranes, post-and-beam barriers, sound walls, overhead signs, and utilities shall be evaluated and if necessary, concrete thicknesses and/or reinforcement increased.

Typical decks, typical overhangs, and soffits shall comply with Bridge Design Memo 9.4 and as specified herein.

### 9.4.3.1 Typical Deck, Typical Overhang, and Soffit Concrete

The concrete bridge deck thickness shall be a minimum of 8 inches.

For cast-in-place concrete box girders,

- The deck overhang thickness shall be a minimum of 8 inches at the edge of deck and a minimum of 12 inches at the face of exterior girder.
- The soffit shall be a minimum of 6 inches.

### 9.4.3.2 Deck Reinforcement for Typical Decks

The specified minimum yield strength for all reinforcing bars in decks and overhangs is 60 ksi.

The transverse top deck reinforcing over the exterior girder supporting a typical overhang shall be equal to or greater than that required for the interior girders.

Longitudinal bars in the top mat of deck reinforcement shall not be smaller than #5 bars and shall be spaced at a maximum of 12 inches.

Continuous longitudinal reinforcement shall be provided at all stirrup hooks.

### 9.4.3.3 Overhang Reinforcement

Additional top mat transverse deck reinforcement shall be provided in the overhang for 5 feet on both sides of a barrier rail expansion joint. The additional bars are not required when the center-to-center spacing between the girders exceeds 11.5 feet.

### 9.4.3.4 Soffit Reinforcement

Bar reinforcing steel in the soffit shall be in accordance with Article 5.12.3.5.2b and consist of two mats.

## 9.4.4 REFERENCES

1. AASHTO. (2017). *AASHTO LRFD Bridge Design Specifications*, 8th Edition, American Association of State Highway and Transportation Officials, Washington DC.
2. Caltrans. (2019). *California Amendments to AASHTO LRFD Bridge Design Specifications*, 8th Edition, California Department of Transportation, Sacramento, CA.
3. Caltrans. (2021). Bridge Design Memo 9.4, *Typical Deck, Typical Overhang, and Soffit Design*, California Department of Transportation, Sacramento.