13.9.2—Geometry

Replace the article with the following:

The height of a bicycle railing shall not be less than 42.0 in., measured from the top of the riding surface. If the bicycle railing and the vehicular rail were not successfully crash tested as an integral unit, the bicycle railing shall be offset a minimum of 15.0 in. behind the face of the vehicular rail.

The height of an in-plane railing for bicycles only shall not be less than 48.0 in. measured from the top of the riding surface.

Bicycle railings shall have rail spacing satisfying the respective provisions of Article 13.8.1.

If deemed necessary, rubrails attached to the rail or fence to prevent snagging should be deep enough to protect a wide range of bicycle handlebar heights.

If screening, fencing, or a solid face is utilized, the number of rails may be reduced.

C13.9.2

Replace the commentary with the following:

Railings, fences or barriers on either side of a shared use path on a structure, or along bicycle lane, shared use path or signed shared roadway located on a highway bridge should be a minimum of 42.0 in. high. The 42.0 in. minimum height is in accordance with the AASHTO Guide for the Development of Bicycle Facilities, Third Edition (1999).

The 15-inch bicycle rail offset behind the face of the vehicular rail is required to maintain the vehicular crash test certification if the vehicular rail and bicycle railing were not crash tested as an integral unit.

In-plane bicycle railing refers to bicycle railing that is:

- not working in combination with vehicular rail, such as along a bikepath where bicycle traffic is separated from vehicular traffic, and
- in-plane for the full height with no offset in the upper portion.

On such a bridge or bridge approach where high speed high angle impact with railing, fence or barrier are more likely to occur (such as short-radius curves with restricted site distance or at the end of a long grade) or in locations with site specific safety concerns, a railing, fence or barrier height above the minimum should be considered.

The need for rubrails attached to a rail or fence is controversial among many bicyclists.

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A13.4.2—Decks Supporting Concrete Parapet Railings

Replace the 1st paragraph with the following:

For Design Case 1, the deck overhang shall be designed to resist the combined effects of tensile force T in kip/ft, and moment M_{ct} as specified herein,

$$T = 1.2\frac{F_t}{L_c} \quad \text{(A13.4.2-1)}$$

$$M_{ct} = 1.2\left[\frac{F_t H}{L_c}\right] \quad \text{(A13.4.2-2)}$$

where:

L_c = critical length of yield line failure pattern (ft). In the absence of more accurate calculations, L_c, may be taken as 10 ft for solid concrete parapets; this value of L_c is valid for design forces TL-1 through TL-4 shown in Table A13.2-1. At the location of expansion joints, the value of L_c shall be half that specified above.

H = height of wall (ft)

T = tensile force per unit of deck length (kip/ft)

M_{ct} = moment in the deck overhang due to F_t (kip-ft/ft)

CA13.4.2

Delete the 1st and 2nd paragraphs and replace with the following:

In the design of barrier rails, it is recognized that the crash testing program is oriented towards survival, not necessarily the identification of the ultimate strength of the railing system. This typically produces a railing system that is significantly overdesigned, and in turn would lead to an over-design of the deck overhang that may not be practical.

Therefore, the design of a deck overhang for Design Case 1 is based on F_t - the transverse force on the barrier rail corresponding to the Test Level as shown in Table A13.2-1, not on the capacity of the barrier rail. To account for uncertainties in the load and mechanisms of failure, and to provide an adequate safety margin, the actual design tensile force acting on the deck overhang and the corresponding design moment obtained through statics are increased by 20%.

All deck overhangs should be designed for TL-4 Barrier Rail loading.

At an expansion joint, and at the beginning and end of a bridge, the value of L_c will be half that at intermediate locations. This will cause an increase in demands in the overhang region. Consequently, the top reinforcing bars in the overhang should be designed to accommodate this increased demand in this region.

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