

Determination of Reinforced Bridge Approach Section Dimension

Design Manual
Chapter 7
Pavement

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This section provides information needed to determine proper reinforced bridge approach section dimensions. Two cases exist, as is seen in Figure 1 below. The two shoulder widths d_1 and d_2 are measured from the edge of the driving lane to the outside edge of the shoulder. Of the two shoulders d_1 and d_2 , d_1 is always taken to be the shoulder located on the shorter side of the double reinforced bridge approach section.

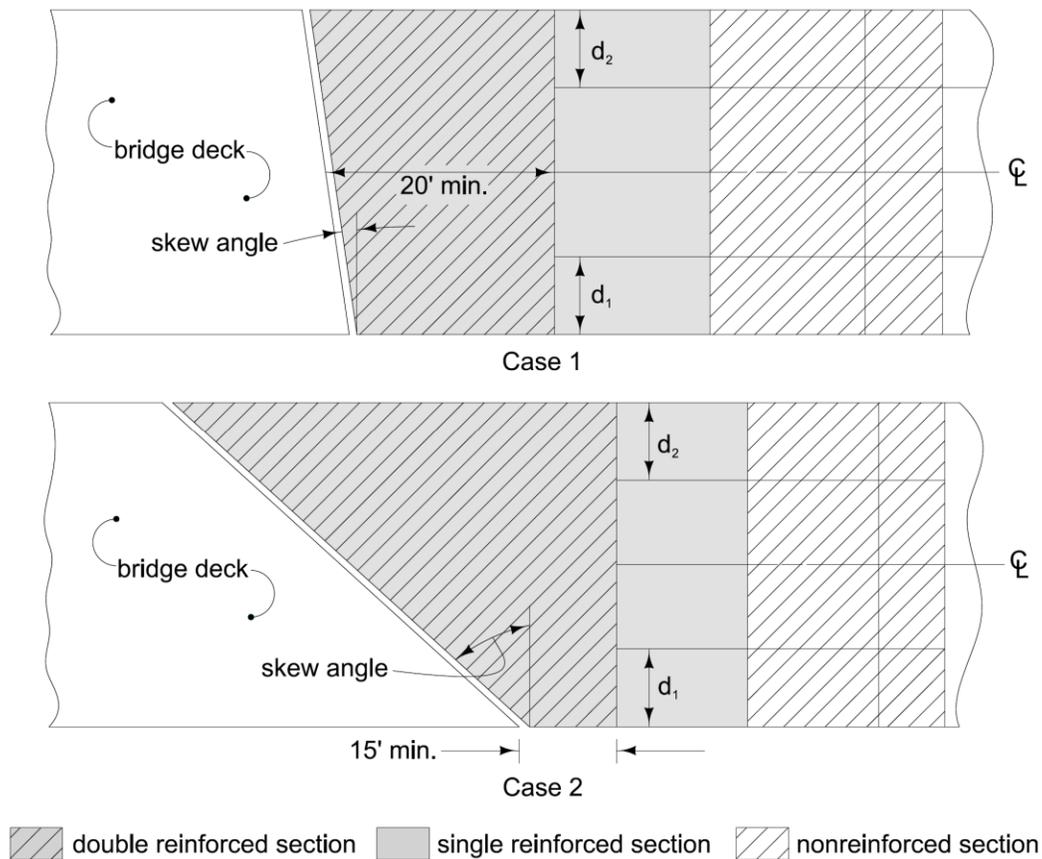


Figure 1: Case 1 and Case 2 bridge approach section layouts.

In Case 1 the double reinforced bridge approach section dimensions are based on a 20 foot minimum distance, measured at the centerline of the road, from the paving notch to the end of the double reinforced bridge approach section. Case 1 is common with small bridge skew angles. In Case 2 the double reinforced bridge approach section dimensions are based on a minimum 15 foot distance from the paving notch to the end of the double reinforced bridge approach section measured at the outside of the shoulder on the short side of the double reinforced bridge approach section. Case 2 is common with large bridge skew angles. Examples are provided below to demonstrate how to determine which case is appropriate for determining double reinforced bridge approach section dimensions.

Once the proper case to use for the double reinforced bridge approach dimensions has been determined, refer to Standard Road Plans [SW-538](#), [SW-539](#), [DR-401](#), and [DR-402](#) as well as the [BR-200s](#) for further information regarding double reinforced bridge approach sections and approach pavement. Indicate on

Tabulation [112-6](#) whether the abutment is fixed (tied) or movable (untied). Also indicate the skew angle and side ahead (for example, 11° left ahead).



Do not use single reinforced bridge approach sections on Primary Road System bridges. Use of double reinforced bridge approach sections on Secondary Road System bridges is encouraged.

Details 'D' and 'E' on the last pages of Standard Road Plans [BR-201](#), [BR-202](#), [BR-203](#), and [BR-204](#) show the back of curb in relation to the guardrail mounting surface for typical bridge end posts. Details 'F' and 'G' on the last page of Standard Road Plan [BR-205](#) show the back of curb in relation to the guardrail mounting surface for typical bridge end posts. These dimensions are important to ensure guardrail posts can be placed properly.

Example 1

The skew angle for the bridge shown in Figure 2 is 10°. This bridge will be a two lane bridge with 10' shoulders ($d_1 = d_2 = 10'$). Determine which case is appropriate to establish double reinforced bridge approach dimensions.

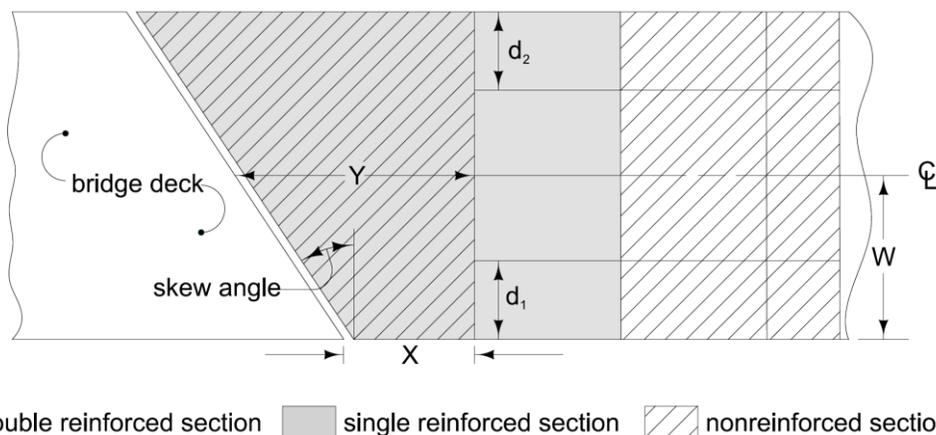


Figure 2: Bridge layout for examples.

First determine the width (W) to the centerline of the road:

$$12' + 10' = 22'$$

Next, assume $X = 15'$.

$$Y = (22')(\tan 10^\circ) + 15' = 18.88' < 20'$$

However, Y must be at least 20' so use Case 1.

Example 2

The skew angle for the bridge shown in Figure 2 is 30°. This will be a two lane bridge with $d_1 = 6'$ and $d_2 = 10'$. Determine which case is appropriate to establish double reinforced bridge approach dimensions.

First determine the width (W) to the centerline of the road:

$$12' + 6' = 18'$$

Next, assume $X = 15'$

$$Y = (18)(\tan 30^\circ) + 15' = 25.39' > 20'$$

Y is greater than 20', so use Case 2.

Chronology of Changes to Design Manual Section:

007D-001 Determination of Reinforced Bridge Approach Section Dimension

3/18/2024	Revised New logo. Revised hatching in Figures 1 and 2.
7/27/2021	Revised Added in SW-539 and BR-205. Added in reference to Details F and G in BR-205.
6/25/2019	Revised Updated hyperlinks. Updated header logo and text.
1/22/2015	Revised Updated references to renumbered standards. Correct Figures 1 and 2 to show X and Y are measured from end of bridge deck. Change "stub" to "tied" and "integral" to "untied" in first paragraph of page 2 to better reflect how abutments are categorized.
9/13/2012	Revised Added language stating double reinforced approach sections are required on Primary Road System bridges and recommended on Secondary Road System bridges. Added language to include skew angle and side ahead in Tab 112-6. Added hyperlinks. Remove metric dimensions.
1/23/2004	Previously Updated.