

 Office of Structures Guidelines and Procedures Memorandum	PLANS
	Number: P-85-31(G)
	Date: 03-16-2018
Shoulder Widths for Bridges on Non-Tangent Alignments	Approval: DRAFT

Refer to GPM D-85-25(G) for the layout of bridges on non-tangent alignments. All AASHTO references are made to *Geometric Design of Highways and Streets*.

Every bridge proposed on a non-tangent alignment shall be evaluated for sight distance. In order to properly address the sight distance needs of motorists, the following criteria for structure shoulder widths shall be used.

Sight distance on bridges shall be the distance required for stopping. For level roadway conditions, this distance (S) shall be the value from AASHTO Exhibit 3-1. For roadways on grades (downgrades or upgrades), use stopping sight distances from AASHTO Exhibit 3-2. The shoulder width required for sight distance can then be calculated from the formula $HSO = R[1 - \cos(28.65S/R)]$ where HSO (horizontal sightline offset) is the distance from the sight obstruction to the centerline of the inner lane, ft; R is the curve radius for the centerline of the inside lane, ft.; S is the stopping sight distance, ft. The required Shoulder Width = $HSO - \frac{1}{2}$ Inside Lane Width. Refer to AASHTO Exhibit 3-54 for additional commentary.

If the shoulder width developed from the above is less than the standard shoulder width, then no further consideration is necessary, i.e., use the standard shoulder width.

If the shoulder width developed from the above is greater than the standard shoulder width, then the shoulder width adjacent to the affected lane shall be increased in 6 inch increments until the sight distance criteria is met. However, in no case shall the shoulder width exceed 12 feet. When this calculation results in a shoulder width in excess of 12 feet, the radius of curvature should be increased or the design speed reduced until a 12 foot shoulder satisfies the sight distance criteria. Reduction in design speed may require a design exception.

In addition to the above, if the shoulder width required for sight distance exceeds the standard shoulder width, the following shall be satisfied.

For One-Way Ramp Bridges With Curvature Moving From Right to Left

When the shoulder width developed from above exceeds the standard left-hand shoulder width and a standard width shoulder is being provided on the right, then the following shall be addressed.

If the bridge has

- (a) a DHV less than 1100 vehicles per lane and has either
- (b) a total length of over 250 feet or
- (c) a span length greater than 150 feet

then the shoulder on the left-hand side shall be increased to the width of a standard right shoulder or minimum width required for sight distance, whichever is greater (not to exceed 12 feet), and the right-hand shoulder width shall be reduced to 4 feet.

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If the bridge does not satisfy (a) and (b) or (a) and (c), then a standard width shoulder shall be provided on the right, and the left shoulder shall be the minimum width required for sight distance (not to exceed 12 feet).

For One-Way Mainline Bridges With Curvature Moving From Right to Left

When the shoulder width developed from above exceeds the standard left-hand shoulder width, then a standard width shoulder shall be provided on the right and the shoulder on the left-hand side shall be increased to the minimum width required for sight distance (not to exceed 12 feet).

For All One-Way Bridges With Curvature Moving From Left to Right

When the shoulder width developed from above exceeds the standard right-hand shoulder width, then a standard width shoulder shall be provided on the left and the shoulder on the right-hand side shall be increased to the minimum width required for sight distance (not to exceed 12 feet).

For Two-Way Bridges

When the shoulder width on the inside of the curve developed from above exceeds the standard shoulder width, then increase the shoulder width on the inside of the curve to accommodate sight distance criteria (not to exceed 12 feet). Shoulder width on outside of curve shall be as dictated by approach roadway section and/or bridge geometrics standard.