

roadway section for the entire project. This process will, of course, require proper communication between the road designer and bridge designer to identify and resolve problems.

The bridge geometrics will be determined in the project scope of work. For a new or reconstructed bridge on a 4R project, the criteria provided in Chapter [53](#) will determine the geometric design of the bridge. For a bridge within the limits of a 3R project, the criteria provided in Chapter [55](#) will determine the bridge geometrics. Chapter [53](#) provides project scope-of-work definitions and a map of the State highway system with designated 3R and 4R routes.

#### **402-6.02(01) Cross Sections [Rev. May 2014, Sep. 2016]**

Figures [402-6D](#), [402-6E](#), [402-6F](#), and [402-6G](#) each provide schematics of the bridge cross section for a specific highway type. The following will apply to the bridge cross section.

1. Bridge Clear-Roadway Width. The geometric design criteria figure in Chapter [53](#) for the appropriate functional classification provides this information for a new or reconstructed bridge within the limits of a 4R project. The geometric design criteria figure in Chapter [55](#) for the appropriate functional classification provides this information for a bridge within the limits of a 3R project. Figure [402-6H](#) shows the relationship between the bridge-railing and approach-guardrail offsets.

Where a bridge clear-roadway width is permitted to be narrower than the travel lanes plus the usable shoulder width on each side, a guardrail transition, collinear with the bridge railing, shall be provided. Thereafter, the guardrail shall be flared at an appropriate barrier flare rate until the guardrail length satisfies the length-of-need requirement or it intersects the approach guardrail. However, a continuous straight, without flare, run of guardrail is preferred for driving comfort and aesthetics. For this situation, the bridge clear-roadway width will nearly match the face-to-face guardrail width of the approach road section.

Chapter [53](#) discusses the design of a median for a long bridge with a sufficiently narrow median. Increased safety benefits can be realized in construction of a single structure. Depending on site conditions, a single structure shall be used rather than twin structures where the median width is approximately 30 ft or less on a freeway, or 20 ft or less elsewhere. The median width at an overpass shall match the median width on the approach.

For the median shoulders of a divided facility with two or more lanes in each direction, each bridge shall have a 5'-8" median-shoulder width where a type FC, FT, or TF-2 railing is used, or a 6'-0" median-shoulder width where another bridge-railing type is used. An

auxiliary lane may be required across a structure where warranted. See Chapter [53](#) for the requirements.

2. Cross Slope. Each new or reconstructed bridge on a tangent section will be constructed with a cross slope of 2% sloping away from the crown. The 2% applies to the entire width from the crown to the face of railing or curb. The crown across the bridge will be in the same location as the approaching roadway crown. A tangent-section cross slope may be increased to 3 to 4%, with only one slope break in the deck, if roadway geometrics require it.
3. Sidewalk. The sidewalk on a bridge is often poured monolithically with the curb and the width dimensioned from the front face of the curb. The sidewalk width is measured exclusive of the curb, i.e. measured from the back face of the curb. Guidance provided by the U.S. Access Board indicates that when there is no defined back face of curb, a 6-in curb width should be assumed. See Figure 402-6P, Bridge Sidewalk Width. Where a bridge includes a sidewalk, the bridge length should be reviewed in accordance with the passing space and sidewalk width criteria in section 51-1.03(02). Section 45-1.06 provides guidelines for sidewalk warrants and sidewalk accessibility criteria. Placement of a sidewalk on a bridge will impact the selection or location of the bridge railing. Section 404-4.02(03) provides criteria for bridge and pedestrian railing.
4. Bridge Width for Traffic Maintenance. The figures in Chapter [53](#) provide criteria for the bridge width. Additional permanent bridge width may be provided solely for the purpose of placing one lane of traffic across the bridge during construction. This can eliminate the need for a detour or runaround, or the use of a local road to re-route traffic during construction. See Chapter [83](#) for more information on maintenance and protection of traffic during construction.
5. Bridge Width on Flat or Short Horizontal Curve. Railings and copings on a bridge within a horizontal curve are built concentric with the roadway centerline. However, where the bridge is on a flat curve, or if the bridge is short, it may be more practical to build the railing and coping parallel to the long chord if the curved roadway plus shoulders and barrier offsets is within the inner faces of the railings, and it is economically feasible to construct a wider tangent bridge deck. It is considered economical if the bridge-deck width is increased by not more than 1 ft. However, it can be increased if it is determined to be more economical. Figure [402-6 I](#) illustrates these criteria.