INDIANA DEPARTMENT OF TRANSPORTATION

Driving Indiana's Economic Growth

Design Memorandum No. 19-02

February 8, 2019

TO: **All Design, Operations, and District Personnel, and Consultants**

FROM: ***/s/Elizabeth W. Phillips***
Elizabeth W. Phillips
Manager, Office of Standards and Policy
Bridge Design Division

SUBJECT: **4-ft Shoulder Cross Slope on Single Lane Ramps**

REVISES: ***Indiana Design Manual*** **(IDM) Section 48-5.02, Figure 48-5B**

EFFECTIVE: **Immediately**

IDM Section 48-5.02, Item 3. *Cross Slope* has been revised to be consistent with the shoulder cross slope information in Section 45-1.02(05). For a single lane ramp in a tangent section, the 4-ft paved left shoulder should be sloped in the same direction as the adjacent ramp lane. This allows for the shoulder and the travel lane to be paved in a single operation. Figure 48-5B, Single Ramp Typical Section has been revised accordingly.

The revised section and figure have been incorporated into the IDM on-line and are included for reference on the following pages.

48-5.02 Cross Section [Rev. Feb. 2019]

See Figure 48-5B for single and Figure 48-5C for multilane ramp typical cross sections for tangent and for superelevated scenarios. The following will also apply to the ramp cross sections:

1. Width. The minimum paved width of a 1-way, 1-lane ramp will be 28 ft. The 28-ft width includes a 4-ft left shoulder, an 8-ft right shoulder and a 16-ft traveled way. Multi-lane ramp widths should be in multiples of 12 ft, with a 4-ft wide left shoulder and a 10-ft wide right shoulder. The guardrail offset from the edge of shoulder should be 2 ft. The bridge railing offset should be 1'-8". Full-depth paving equal to the ramp pavement thickness should be provided on the shoulders because of frequent use of shoulders for turning movements and passing stalled vehicles

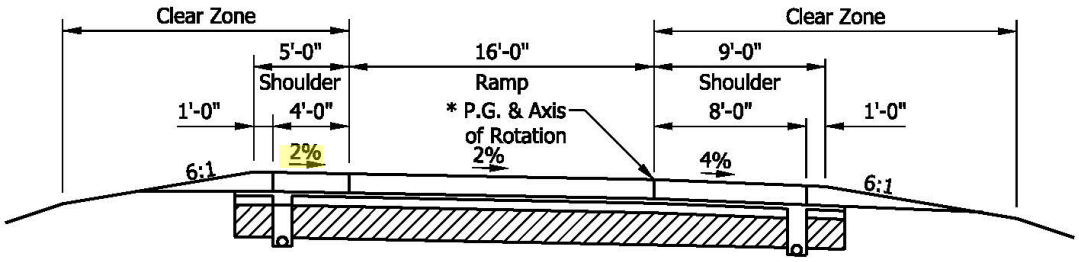
   The designer must request approval from the Department to reverse the left and right shoulder widths to provide additional sight distance for ramps that have tight or prolonged curves to the left.

2. Pavement Design. Loop ramps and other ramps with curve radii less than or equal to 300-ft should be designed with full-depth pavement for the entire 28-ft width. For ramps with curve radii greater than 300-ft, only the 16-ft traveled way will typically have a full-depth pavement structure. Outer connector ramps at a cloverleaf interchange or the ramps at a diamond interchange should have full-depth shoulders. For additional pavement design information, see Chapter 304.

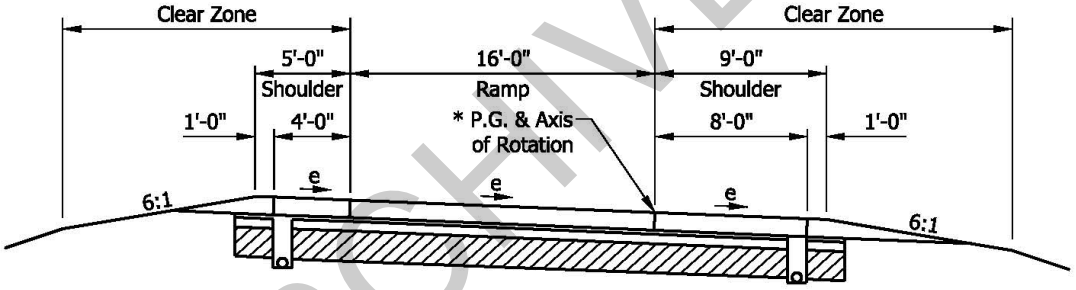
3. Cross Slope. On a tangent section of a single lane ramp, the cross slope of the traveled way and the left shoulder match, typically at 2%. The right shoulder cross slope is typically 4%. For all superelevated ramps, the entire ramp width, including the shoulders, should have the same cross slope. The cross slopes of multi-lane ramps are the same as the cross sectional elements of the freeway mainline typical tangent section. See Figure 48-5B for single lane sections and Figure 48-5C for multi-lane sections.

4. Curbs. In general, curbs should not be used on ramps. However, mountable curb may be used for drainage or to prevent erosion on steep embankment slopes. See Section 49-3.04 for additional curbing information. Curbs may be placed at the edge of the roadway of a ramp on a low speed facility if approved by the Department.

5. Bridges and Underpasses. The full paved width of the ramp should be carried over a bridge or beneath an underpass. The clear width under an underpass should also include the clear zone.



Single Lane Ramp Section in Tangent



Single Lane Ramp Section in Superelevation

* The axis of rotation and PG may be moved to the centerline of the ramp to reduce transition length.

SINGLE LANE RAMP TYPICAL SECTION

FIGURE 48-5B