

Cross Sections of One-Way Ramps and Loops

Design Manual
Chapter 6
Geometric Design

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This section provides design requirements for one-way ramps (also known as slip ramps or diagonal ramps) and loops (also known as loop ramps). Requirements are provided for both one-lane and two-lane facilities.

One-Lane Ramps and Loops

Because ramp and loop designs vary depending on whether they are part of the interstate or non-interstate system, ramp and loop design requirements are provided for both the interstate and non-interstate systems.

Interchanges on the Interstate System

Ramps are normally designed with a 16-foot (4.8-meter) pavement width. If any portion of the ramp is designed with a radius between 150 and 249 feet (90 meters or less), a pavement width of 18 feet (5.5 meters) shall be used for that portion. An example would be where a free right-turn movement is designed at a ramp terminal. In this case, the transition in pavement width should occur immediately prior to the ramp terminal. There is no reason to provide additional pavement width where it is not required by the roadway geometry.

Typical 7131 details the transition area and should be included in the plans if additional pavement width on a ramp is warranted.

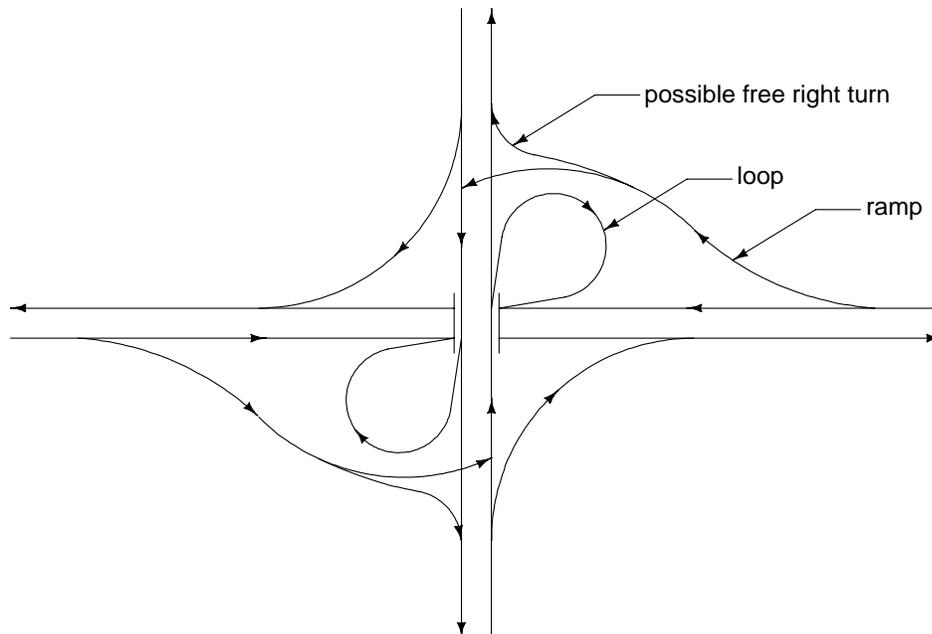


Figure 1: Illustration of ramps and loops.

Loops tend to be designed where right-of-way constraints prevent the development of ramps or where high traffic volumes create a need to eliminate at-grade—left-turn crossings. Alignments for loops usually involve compound horizontal curves, where the loop merges with the mainline.

A loop should be designed for one constant cross section width. If the radius of the major portion of the loop curvature (not the tapers) is less than 250 feet (90 meters), the pavement width should be 18 feet (5.5 meters) for the entire loop. Otherwise, the pavement width for the entire loop should be 16 feet (4.8 meters).

Shoulders for ramps and loops on the interstate system are paved and should be 4 feet (1.2 meters) wide on the left side and 6 feet (1.8 meters) wide on the right side when facing in the direction of travel. Refer to Section 3C-3 for information on shoulder treatment within the superelevated area of the ramp or loop.

Interchanges on the Non-Interstate System

For interchanges that are not part of the interstate system, pavement and shoulder widths shall be the same as indicated above for interstate ramps and loops. The shoulders shall be granular on both sides of a ramp and shall be paved on both sides of a loop.

The one exception to this occurs when the ramp is superelevated in excess of 7%, in which case the entire high-side shoulder is paved as shown on Typical 2016. Refer to Section 3C-3 for more information on shoulder treatment within the superelevated area of the ramp or loop.

Weigh Stations and Rest Areas

Ramps and loops at weigh stations on the interstate system have the same cross section requirements as interchange ramps and loops on the interstate system. Those on the non-interstate system have the same cross section requirements as interchange ramps and loops on the non-interstate system. The shoulder surface of a ramp shall match the adjacent mainline's shoulder surface, subject to the requirements associated with Typical 2016. Loop shoulders shall be paved.

Two-Lane Ramps

Two-lane ramps have the same design requirements as one-lane ramps except for the following:

- the pavement width for two-lane ramps is normally 24 feet (7.2 meters).
- for ramps that allow high-speed merging, such as directional and semi-directional ramps, the shoulder widths shall be the same as the mainline shoulders (normally 6 and 10 feet or 1.8 and 3.0 meters). For ramps that require stopping or a large reduction in speed before merging, such as diamond-type ramps, the shoulder widths are the same as one-lane ramps (4 and 6 feet or 1.2 and 1.8 meters). These cases are illustrated in Figure 2. Refer to Section 3C-3 for information on shoulder treatment within the superelevated area of a two-lane ramp.

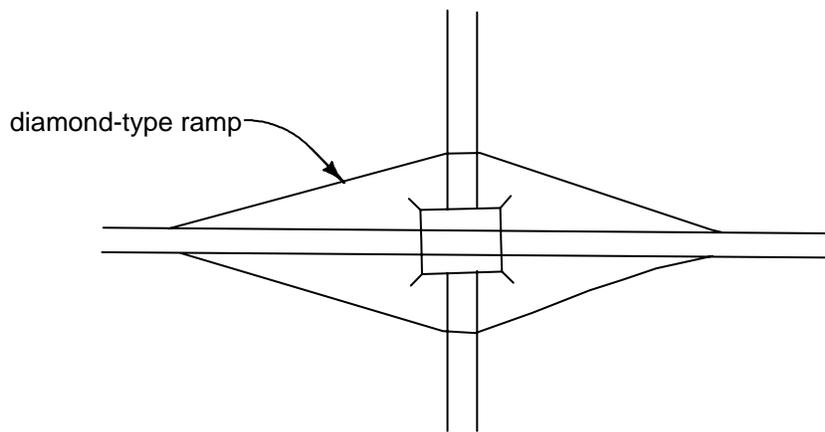
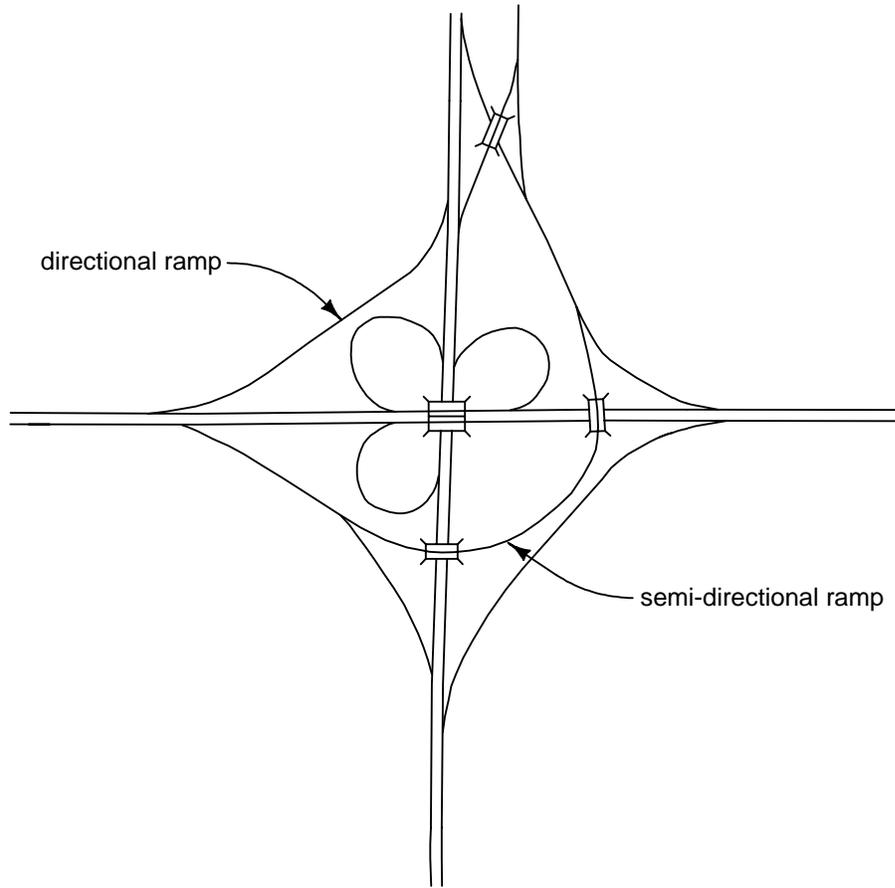


Figure 2: For directional and semi-directional two-lane ramps, the shoulder widths are as wide as the typical shoulders on the mainline. For diamond-type two-lane ramps, the shoulder widths are the same as one-lane ramps (4 and 6 feet or 1.2 and 1.8 meters).