

Pickering, John

From: Purvis, Keith
Sent: Friday, April 02, 1999 11:20 AM
To: Pickering, John
Subject: Rumble Strips on Ramps

Follow Up Flag: Follow up
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John

Wendel called and said to make a note that we need to discuss this with him when you get back. He tends to think we don't need them, but is willing to discuss. (Sounds like we may lose this one.)

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DISCUSSION WITH WENDEL
ON 4-5-99. DAVID SEAK'S
PROJECT ON SR 25 WILL HAVE
RUMBLE STRIPS ON PAVED
SHOULDERS OF INTERCHANGE RAMPS;
HOWEVER, AS A POLICY OF RWD,
WE WILL NOT PLACE RUMBLE
STRIPS ON ANY OTHER INTERCHANGE
RAMPS.

Shoulders and lateral clearances. Design values for shoulders and lateral clearances on the ramps are as follows:

1. When paved shoulders are provided on ramps, they should have a uniform width for the full length of ramp. For one-way operation, the sum of the right and left shoulder widths should not exceed 3.0 to 3.6 m. A paved shoulder width of 0.6 to 1.2 m is desirable on the left with the remainder of 2.4 to 3.0 m as the paved right shoulder.
2. The ramp traveled-way widths from Table X-3 for Case II and Case III should be modified when paved shoulders are provided on the ramp. The ramp traveled-way width for Case II should be reduced by the total width of both right and left shoulder. However, in no case, should the ramp traveled-way width be less than required for Case I. For example, with condition C and a 125 m radius, the Case II ramp traveled-way width without shoulders is 6.6 m. If a 0.6 m left shoulder and a 2.4 m right shoulder are provided, the minimum ramp traveled-way width would be 4.8 m.
3. Directional ramps with a design speed over 60 km/h should have a paved right shoulder of 2.4 to 3.0 m and a 0.3 to 1.8 m paved left shoulder.
 $\begin{matrix} 8' & 10' & 1' & 6' \end{matrix}$
4. For freeway ramp terminals where the ramp shoulder is narrower than that on the freeway, the paved shoulder width of the through lane should be carried into the exit terminal, and should begin within the entrance terminal, with the transition to the narrower ramp shoulder effected gracefully on the ramp end of the terminal. Abrupt change should be avoided.
5. Ramps should have a lateral clearance on the right outside of the edge of the traveled way of at least 1.8 m, and preferably 2.4 to 3.0 m, and on the left a lateral clearance of at least 1.2 m beyond the edge of ramp traveled way.
 $\begin{matrix} 6' & 8' & 10' \end{matrix}$
6. Where ramps pass under structures, the total roadway width should be carried through without change. Desirably, structural supports should be located beyond the clear zone. As a minimum, the structural supports should be a minimum of 1.2 m beyond the edge of paved shoulder. The AASHTO *Roadside Design Guide* (1) gives guidance on clear zone and the use of roadside barriers.
7. Ramps on overpasses should have the full approach roadway width carried over the structure.
8. Edge lines and/or some type of color or texture differentiation between the traveled way and shoulder is desirable.

Shoulders and curbs. Shoulders are needed on ramps and terminals at interchange areas to provide stopping space clear of the traffic lanes, to minimize the effect of breakdowns, and to aid drivers who may be confused.

Highways preferably are designed without curbs, and ramps at interchanges are similarly treated. Curbs should be considered only to facilitate particular difficult drainage situations as in urban areas where enclosed drainage is required because of restricted right-of-way. In some cases, curbs are used at ramp terminals but are omitted along the central ramp portions. The use of curbs on facilities designed for intermediate or higher speeds is not recommended except in special cases. Where curbs are not used, full-depth paving should be provided on shoulders because of the frequent use of shoulders for turning movements. On low-speed facilities curbs may be placed at the edge of roadway. Barrier curbs are seldom used in conjunction with shoulder except where pedestrian protection is required. On high-speed facilities mountable curbs should desirably be placed at the outer edge of the shoulder. Because of fewer restrictions and more liberal designs, the need for curbs in rural areas seldom arises. See Chapter IV for a full discussion of shoulder cross-section elements.

Ramp Terminals

The terminal of a ramp is that portion adjacent to the through traveled way including speed-change lanes, tapers, and islands. Ramp terminals may be of at-grade type, as at the crossroad terminal of diamond or partial cloverleaf interchanges, or the free-flow type where ramp traffic merges with or diverges from high-speed through traffic at flat angles. Design elements for the former type are discussed in Chapter IX, and those for the latter type are discussed in the following sections.

Terminals are further classified according to the number of lanes on the ramp at the terminal, either single or multilane, and according to the configuration of the speed-change lane, either taper or parallel type.

Left-hand entrances and exits. Left-hand entrances and exits are contrary to the concept of driver expectancy when intermixed with right-hand entrances and exits.

Extreme care should be exercised to avoid left-hand entrances and exits in the design of interchanges. Even in the case of major forks and branch connections, the less significant roadway should exit and enter on the right. (See the discussion of route continuity in this chapter.)

Left-side ramp terminals break up the uniformity of interchange patterns and in general create hesitant operation on the through roadways.

**A POLICY
on
GEOMETRIC DESIGN
of
HIGHWAYS
and
STREETS**

1994



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