

## ENGINEERING DIRECTIVE

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CHIEF ENGINEER

### Measures to Enhance Highway Safety

This Engineering Directive identifies physical measures to be used on road and bridge projects for the purpose of enhancing highway safety for drivers, bicyclists, pedestrians and highway work crews. The measures included in this Engineering Directive help to address potential problems caused by fatigued or distracted drivers.

Specifically, this Engineering Directive addresses MassDOT requirements for:

- Milled Rumble Strips
- Reflectorized Markers Slotted in Pavement
- Radar Detector Activators

This Engineering Directive supersedes MassHighway Policy Directive P-04-001, dated October 18, 2004. This Engineering Directive is effective immediately and shall be applied to all projects under design and construction that meet the criteria specified herein.

### Milled Rumble Strips

Milled rumble strips shall be installed within shoulders on all resurfaced, reconstructed or newly constructed state-owned highways in accordance with the *Construction Standard Details*, the *Standard Specifications for Highways and Bridges* and as follows:

- a) On all freeways where bicycle travel is legally prohibited.
  - 1) **Outside Shoulders** – In areas with paved outside shoulders of 2 feet or more, rumble strips shall be installed in the paved outside shoulder 4 inches from the outside edge line.
  - 2) **Inside (Median) Shoulders** – In areas with paved inside shoulders of 2 feet or more, rumble strips shall be installed in the paved inside shoulder 4 inches from the median edge line.

- 3) **Travel Permitted in Outside Shoulder** – In areas where travel is legally permitted in the paved outside shoulder during certain hours, rumble strips shall not be installed in the paved outside shoulder.
  - 4) **Accel/Decel Lanes** – In areas where acceleration and/or deceleration lanes have no paved outside shoulders, any rumble strips that are in outside shoulders shall be terminated at the beginning of the deceleration lane and initiated at the end of the acceleration lane.
  - 5) **Bridge Decks** – Rumble strips shall not be installed on bridge decks.
- b) On all other state-owned highways with a posted speed limit of 40 MPH or greater if the roadway is not in a residential area, except as provided in part c) of this section.
- 1) **Outside Shoulders** – In areas with paved outside shoulders of 8 feet or more, rumble strips shall be installed in the paved outside shoulder 4 inches from the outside edge line. The rumble strips shall be applied in a gap pattern, with 16-foot gaps between each 64-foot run of rumble strip. These gap openings are intended to permit bicyclists to maneuver in and out of the shoulder to make left turns and to avoid debris or obstacles in the shoulder. If the paved outside shoulder is less than 8 feet, rumble strips shall not be installed.
  - 2) **Inside (Median) Shoulders** – On divided highways with paved inside shoulders of 2 feet or more, rumble strips shall be installed in the paved inside shoulder 4 inches from the median edge line.
  - 3) **Intersections and Driveways** – Rumble strips shall not be installed within 50 feet of intersections and major driveways. In addition, rumble strips shall not be installed in any other locations that would impede the normal travel of bicyclists.
  - 4) **Bridge Decks** – Rumble strips shall not be installed on bridge decks.
- c) Exceptions to the application requirements contained in part b) of this section may be allowed if properly justified in writing by the designer and if approved by the Chief Engineer. In general, these exceptions should be considered when the standard rumble strip application is expected to cause a negative impact on bicyclists that outweighs the expected positive impacts for all users. Exceptions may include alternate rumble strip widths, depths, locations and gap patterns; or may include no application of rumble strips. Proper justification shall include discussion of the standard application, constraints or reasons why the standard application is not appropriate for the specific location, and anticipated safety benefits for all users of the proposed application. The designer shall follow a context-sensitive design process to determine the most appropriate solutions for the defined problems for each project location.

### **Reflectorized Markers Slotted in Pavement**

Reflectorized markers slotted in pavement shall be installed on all state-owned highways that meet the following criteria:

- a) Along the lane lines on freeways.
- b) Along the lane lines of all multi-lane, non-divided highways with posted speed limits of 40 MPH or greater.
- c) Along the center lines of non-divided highways with posted speed limits of 40 MPH or greater.
- d) Along channelizing lines of freeways at exit and entrance ramp gores.
- e) Along the left edge lines of exit and entrance ramps.
- f) Reflectorized markers slotted in pavement shall not be installed on bridge decks.

### **Radar Detector Activators (“Drone” Radar Units)**

Radar Detector Activators shall be used on all construction projects on state-owned freeways and on other state-owned highways with posted speed limits of 50 MPH or greater.

Radar Detector Activators shall conform to the most recent MassDOT specifications for such items.