



**Highway Safety & Design Engineering Instructions (HSDEI)**

**Distribution:** Highway Division, Director of Policy, Planning and Intermodal Development, American Council of Engineering Companies of Vermont

**Approved:** \_\_\_\_\_  
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**Date:** \_\_\_\_\_

**Subject: Guidelines for Milled Rumble Strips**

**Administrative Information:**

**Effective Date:** HSDEI 17 – 101 shall be effective from the date of approval.

**Superseded HSDEI:** HSDEI 14 – 101 Guidelines for Milled Centerline Rumble Stripes

**Exceptions:** Not applicable.

**Disposition of HSDEI Content:** The content of HSDEI 17 – 101 will be incorporated into a future revision to the Highway Safety & Design Manual and/or other applicable design guidance documentation.

**Purpose:**

Milled Rumble Strips are an effective countermeasure for reducing roadway departure crashes. The noise and vibration produced by Milled Rumble Strips alert drivers when they leave the traveled way. The Vermont Agency of Transportation currently installs the following types of Milled Rumble Strips:

**Milled Rumble Strips (Centerline)**

Milled Rumble Strips (Centerline), also known as centerline rumble stripes (CLRS), are a proven strategy for reducing head-on and opposite direction sideswipe crashes. They are also expected to be effective in reducing run-off-road crashes where vehicles cross the centerline prior to leaving the roadway, reducing lane drift due to distracted/fatigued driving, and in reducing speed and off tracking in curved sections. Milled rumble strips (centerline) are also expected to improve centerline visibility in wet pavement conditions and provide enhanced guidance during snow events.

**Milled Rumble Strips (Shoulder)**

Milled Rumble Strips (Shoulder) are an effective strategy for reducing run-off-road crashed where vehicles leave the roadway without crossing the centerline, reducing lane drift due to distracted/fatigued driving or during times of inclement weather conditions where there is reduced visibility.

## Technical Information:

### Milled Rumble Strips (Shoulder)

Milled Rumble Strips (Shoulder) shall be installed on all limited access divided highways and should be considered for limited access non-divided highways.

Designers shall include Highway Safety & Design Detail [HSD - 213.01 Milled Rumble Strips \(Shoulder\)](#) in project plans where Milled Rumble Strips (Shoulder) are to be required.

### Milled Rumble Strips (Centerline)

Milled Rumble Strips (Centerline) should be installed along all National Highway System routes where the following criteria is met and considered for all other two-lane and multi-lane non-divided highways also meeting the following criteria:

1. Combined travel lane and shoulder is 14 feet or greater in each direction.
2. Speed limit is 45 mph or higher.
3. AADT is 1500 or greater.
4. Pavement condition is new or good, with no paving/overlay projects anticipated within three years following installation of Milled Rumble Strips (Centerline). (Installing Milled Rumble Strips (Centerline) in micro surfacing overlays is currently experimental)
5. Milled Rumble Strips (Centerline) may be considered for highways not meeting these criteria based on engineering judgment, especially where the crash history indicates a pattern of head on, sideswipe, or single vehicle crashes, or the local legislative body requests such treatment.
6. Milled Rumble Strips (Centerline) may be considered for site-specific crash mitigation such as approaches to intersections near vertical crests where “NO LEFT TURN EXCEPT AT BREAK IN CENTERLINE” sign is used in order to encourage drivers not to turn before maximum sight distance is available, or on approaches where undivided highways become divided highways in order to mitigate wrong way vehicles.

### Design Guidance:

1. Thermoplastic markings shall not be used, because the application method (extruded ribbon) does not allow for uneven surfaces. Tape is also not appropriate for use in Milled Rumble Strips (Centerline) segments. Polyurea, epoxy, and paint are compatible with Milled Rumble Strips (Centerline). Where durable markings are to be recessed, recesses shall be grooved prior to installing Milled Rumble Strips (Centerline).
2. Milled Rumble Strips (Centerline) should be continuous through marked passing zones.
3. Special consideration should be given when truck tracking over the centerline may occur at intersections and sharp curves.
4. Milled Rumble Strips (Centerline) should be discontinued where or at:
  - Centerline breaks are provided (ie, for intersections and railroad crossings).
  - Residences within 100 feet of the centerline (to mitigate noise).
    - Gaps for residences within 100 feet of the centerline shall be gapped the width of the residence and 100 feet on each side of the residence.
  - Breaks total a length of 1320 feet (quarter mile), or more, within a half mile section.
  - The minimum length of rumble segments is less than 500 feet (gaps for town highways will be measured as continuous Milled Rumble Strips for the purposes of determining this minimum length).
  - Raised medians are provided (engineering judgment should be used for painted medians).
  - Two way left turn lanes (TWTL) are provided.
  - Closely spaced commercial drives with high volume turning traffic.

- Bridges where the curb to curb width is less than 28 feet.
- Bridges or concrete roadways with less than 2.5” of bituminous pavement overlay.

Public Outreach (for projects where Milled Rumble Strips (Centerline) are not currently installed):

1. Contact, either through email or by letter, shall be made with the appropriate Operations district and Regional Planning Commission to make them aware of the intent to install Milled Rumble Strips (Centerline) within their district or region prior to contracting the project.
2. Contact, either through email or by letter, shall be made with the select board and/or town administrator for any town through which the Milled Rumble Strips (Centerline) are to be installed.
3. The designer may coordinate with the Policy, Planning & Intermodal Development Division's Public Outreach Manager to inform the public of the additions to the roadway, and provide the local legislative body the opportunity for a public information meeting during the design phase.

Designers shall include Highway Safety & Design Detail [HSD - 213.02 Milled Rumble Strips \(Centerline\)](#) in project plans where Milled Rumble Strips (Centerline) are to be required.

### **Implementation:**

The content of HSDEI 17 – 101 is to be implemented beginning immediately for all projects produced and or managed by VTrans. The design team shall be responsible for documenting the criteria for the installation of Milled Rumble Strips, including any discontinuities or gaps.

### **Transmitted Materials:**

Highway Safety & Design Details:

- [HSD - 213.01 Milled Rumble Strips \(Shoulder\)](#)
- [HSD - 213.02 Milled Rumble Strips \(Centerline\)](#)

The above Highway Safety & Design Detail can be found at the link below:

<http://vtrans.vermont.gov/docs/highway-safety-design-details>