



MaineDOT Highway Program Design Guidance

Title: Rumble Strips

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Discipline: General Engineering

Reference: N/A

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Background

Rumble strips are designed to gain the attention of a driver through sound and vibration. The natural byproduct of rumble strips is noise. In isolated areas this is usually not a problem; in more populated areas this can be disruptive to nearby residences or businesses. Consideration for high density residential areas and proximity of special occupancies (residences, hotels, motels, campgrounds, nursing homes, etc.) should be weighed in determining the installation of rumble strips.

This Design Guidance is intended to define when and where centerline and edge line rumble strips may be applied on the state highway system for lane departure mitigation purposes.

Rumble strip installations vary by road setting, detail sheets have been developed to provide guidance.

Experienced MaineDOT field personnel should be involved in the layout of rumble strips prior to their installation.

Guidance

Rumble strips may have a standard or sinusoidal profile (see Figures 1 & 2). In sinusoidal rumble strip installations with gap patterns, a 1/8 inch trough will be milled continuously through the length of the installation, except this trough shall not continue through intersections.

General

Standard rumble strips should be used when rumble strips are installed on the interstate or divided highways. Sinusoidal rumble strips should be used when rumble strips are installed on all other roads.

Except for unusual situations, rumble strips should be considered only for the following conditions:

- Rumble strips are most effective and intended for use on road segments with speed limits of 45 mph and greater.
- Travel lanes are 11ft. or greater in width; shoulders should be paved and 4ft. or greater in width.
- If 16' from centerline to edge of pavement is not available, additional traffic control may be necessary during installation.
- The corridor or corridor segment is identified as a priority corridor or by crash history.
- In developed or urban areas rumble strips should not be installed unless found justifiable on a case by case basis.
- Rumble strips generally should not be installed on bridge decks or overpasses, but should be considered on high speed bridges. (see Figure 5)
- Before installation, communication with the town(s) is necessary and notification of the abutters is strongly recommended, especially residences/residential properties and hotels/motels and campgrounds. Follow-ups with the towns should be made to make sure information has been communicated. Public meetings should be held when public concerns arise.

Centerline Rumble Strips

- Corridor or corridor segment is an undivided highway.
- Centerline rumble strips shall not be used where continuous two-way left-turn lanes exist.
- Centerline rumble strips shall not be installed through intersections or major entrances. (see Figure 6)
- In no-passing, double solid centerline locations, centerline rumble strips shall be continuous. (see Figure 3)
- In passing zones, centerline rumble strips shall be segmented with 20 ft. of rumble strip, followed by a 20 ft. break in a repeating pattern for the length of the passing zone. (see Figure 4)
- Centerline rumble strips may or may not be the physical midpoint of the road, but should coincide with the centerline striping. Painted center lines should be

located as best as practicable so that they are painted on the centerline rumble strips.

Edge Line Rumble Strips

- Shoulder pavement is at least 3 in. in depth.
- Barrier offset (LB) shall provide at least a 5 ft. usable shoulder.
- For the safety of bicyclists...
 - In rural areas, a 3 ft. minimum usable shoulder is required
 - In urban or village areas without curb, a 4 ft. minimum usable shoulder is required
 - In urban or village areas with curb, a 5 ft. minimum usable shoulder is required

Concurrence of the Safety Office in consultation with the Bicycle/Pedestrian Coordinator is required when conditions for any of the above three bullets cannot be met.

- Twelve foot gaps should be provided (rumble strip pattern has 48 ft. long segments of rumble strips and 12 ft. segments of no rumble strips). (see Figures 3 & 4)
- On segments where bicycles are prohibited...
 - The minimum shoulder width is 4 ft.
 - Twenty foot gaps should be provided (rumble strip pattern has 80 ft. long segments of rumble strips with 20 ft. segments of no rumble strips) (see Figure 12)
- No rumble strips shall be placed where on-street parking exists.
- Truck off-tracking should be analyzed on the inside of curves. If truck off-tracking conflicts with edge line rumble strip placement, then rumble strips shall be omitted in these locations to mitigate noise pollution.

Other considerations

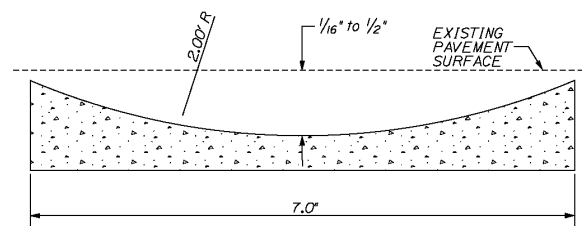
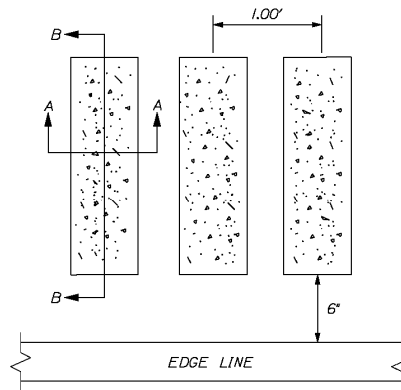
- Warning signs shall be erected at the limits of the rumble strips and at all routed intersections.
- Centerline and edge line rumble strips may be installed on the same roadway segments or as isolated installations.
- Sealant shall be applied over rumble strips to protect pavement and joints. Item 410.151 Emulsified Asphalt Seal Coat, Applied.
- Use of temporary rumble strips, such as TOMs or raised pavement markers, should be considered when an existing rumble strip installation is overlaid and not immediately reinstalled.

- Consultation with Pavement Engineer (or designee) determines surface and shoulder pavement to show no sign of distress or pavement joint deterioration.

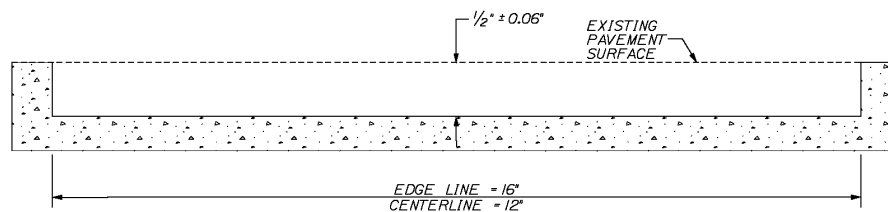
Details

The following Rumble Strip Details include:

- Figure 1 - Standard Edge Line Dimensions
- Figure 2 - Sinusoidal Edge Line & Centerline Dimensions
- Figure 3 - Undivided Highways: No Passing Zones
- Figure 4 - Undivided Highways: Passing Zones
- Figure 5 - Undivided Highways: Bridges
- Figure 6 - Undivided Highways: Side Roads & Entrances
- Figure 7 - Undivided Highways: Intersections with Turn Lanes
- Figure 8 - Special Situations on Undivided Highways: Intersection or Auxiliary Left Turn Lanes (Optional)
- Figure 9 - Special Situations on Undivided Highways: Raised Islands
- Figure 10 - Special Situations on Undivided Highways: Left Turn Lanes
- Figure 11 - Interstate & Divided Highways: Cross Overs
- Figure 12 - Interstate & Divided Highways: Standard Divided Highway
- Figure 13 - Interstate & Divided Highways: On Ramp Placement
- Figure 14 - Interstate & Divided Highways: Off Ramp Placement



SECTION A-A
(NOT TO SCALE)



SECTION B-B
(NOT TO SCALE)

NOTES:

1. ALL RUMBLE STRIPS SHALL BE MILLED
2. RUMBLE STRIPS SHALL NOT BE PLACED ON BRIDGES
3. EMULSIFIED ASPHALT SEAL COAT SHALL BE APPLIED OVER RUMBLE STRIPS AND PAID UNDER THE APPROPRIATE ITEM. SEAL COAT SHALL BE APPLIED 3" WIDER THAN THE RUMBLE STRIP IN BOTH DIRECTIONS.
4. ON DIVIDED HIGHWAYS USE EDGELINE RUMBLE STRIP DETAILS FOR BOTH SIDES OF THE ROAD.

Figure 1 - Standard Edge Line Dimensions

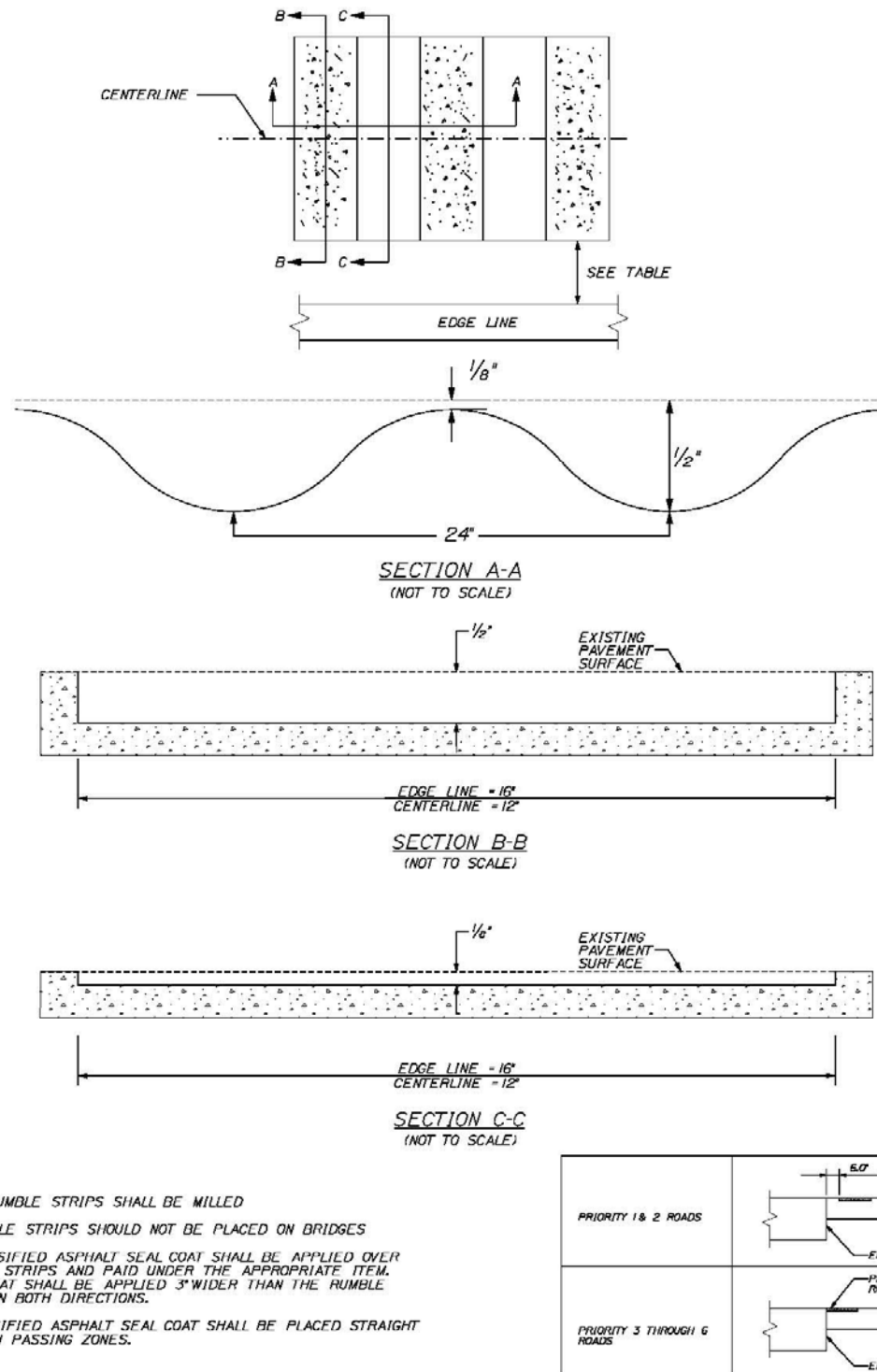


Figure 2 - Sinusoidal Edge Line & Centerline Dimensions

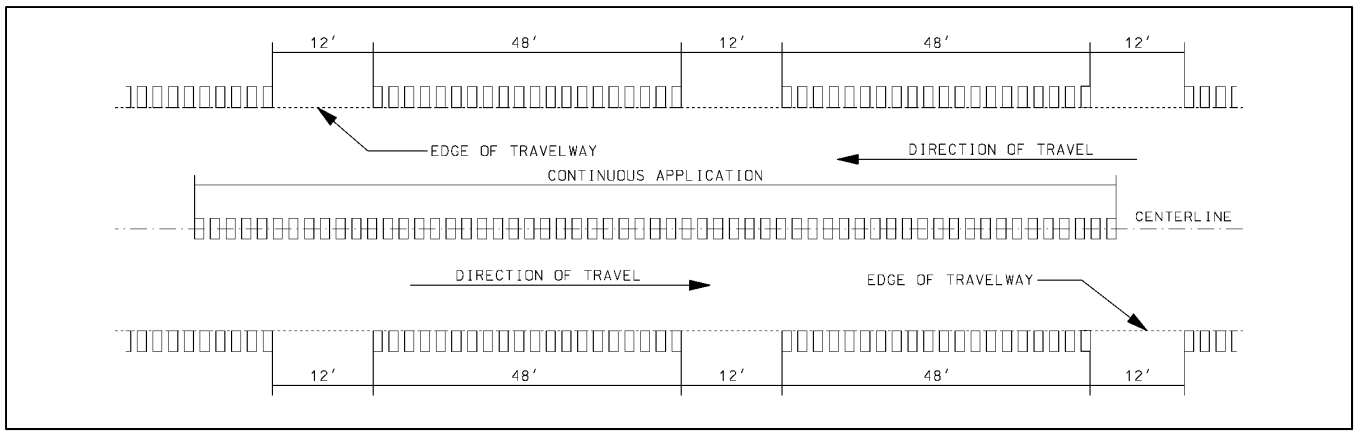


Figure 3 - Undivided Highways: No Passing Zones

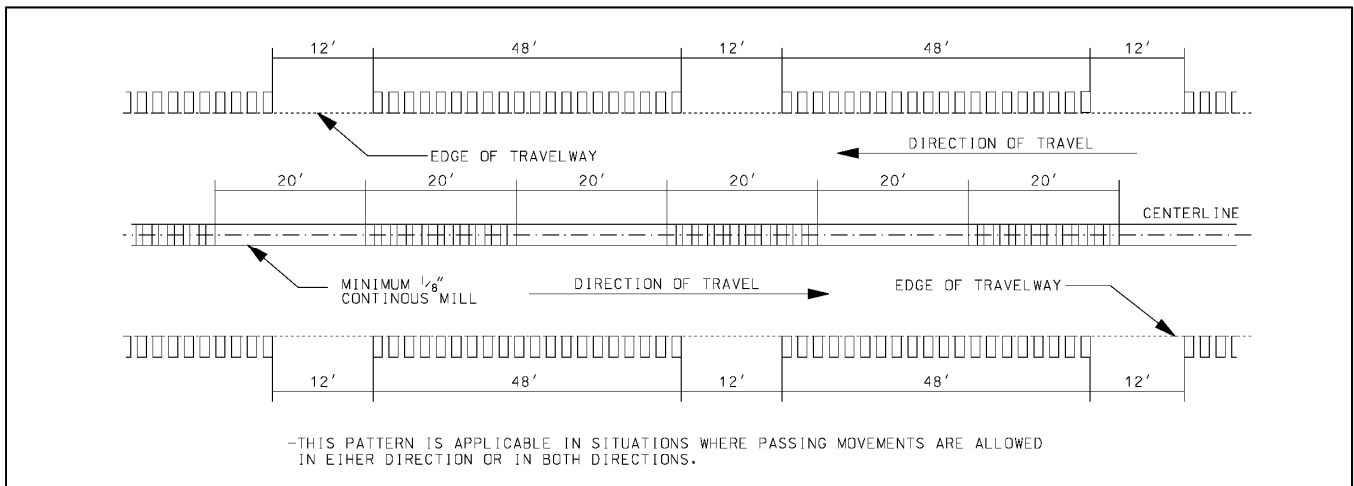


Figure 4 - Undivided Highways: Passing Zones

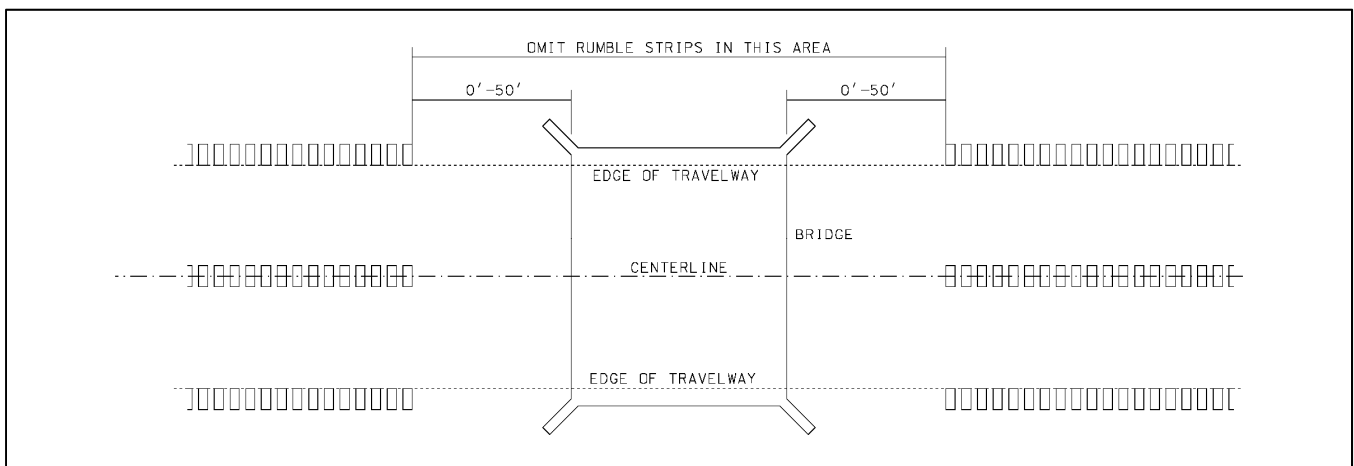


Figure 5 - Undivided Highways: Bridges

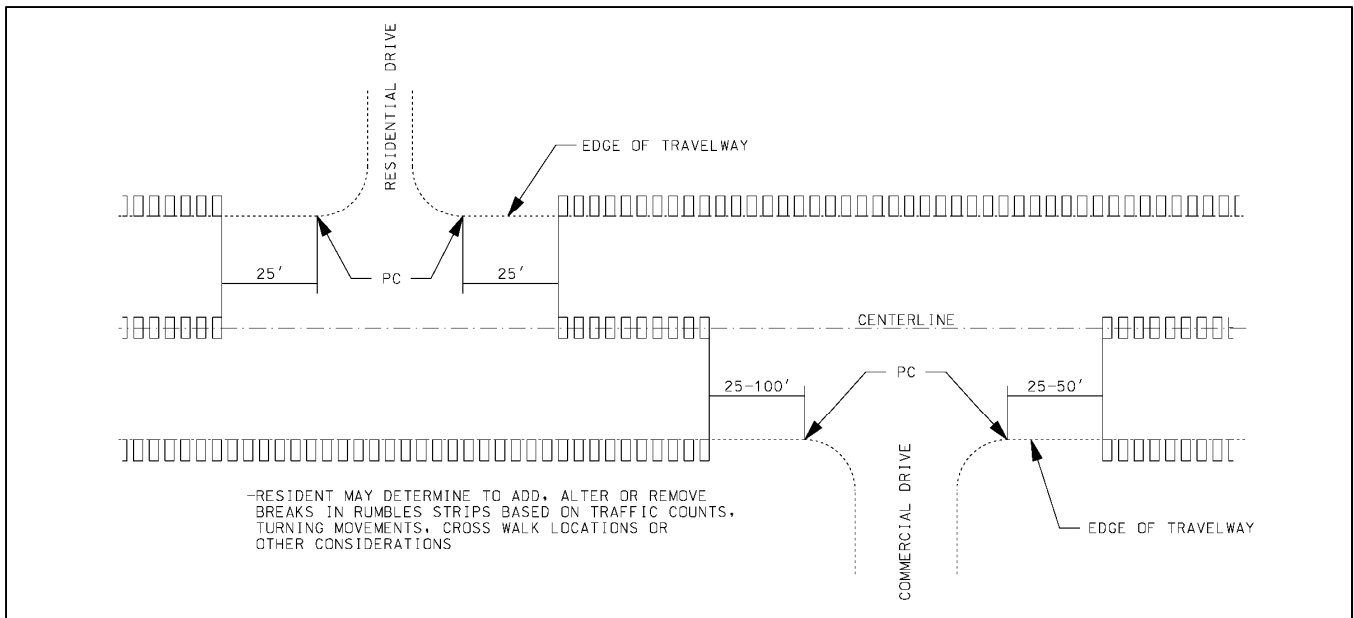


Figure 6 - Undivided Highways: Side Roads & Entrances

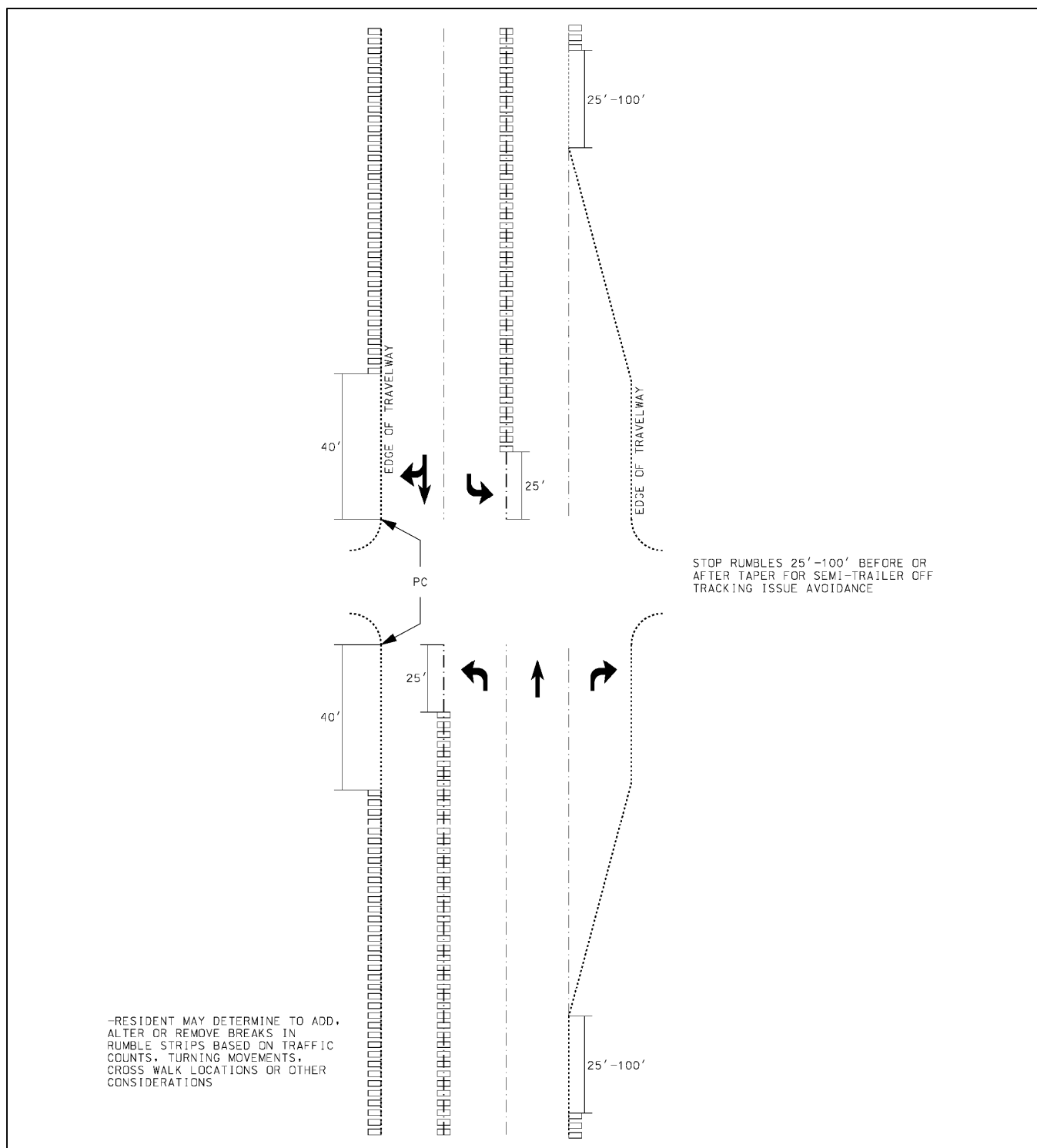


Figure 7 - Undivided Highways: Intersections with Turn Lanes

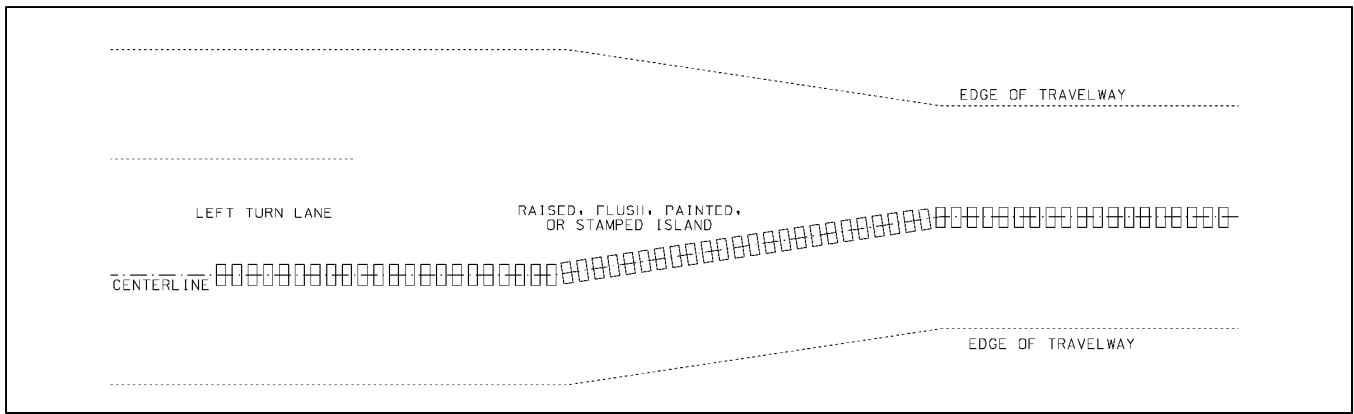


Figure 8 - Special Situations on Undivided Highways: Intersection or Auxiliary Left Turn Lanes (Optional)

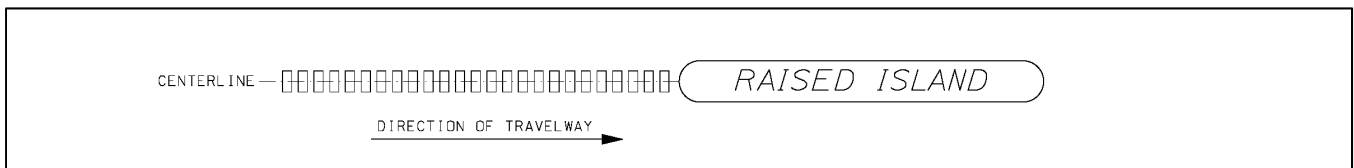


Figure 9 - Special Situations on Undivided Highways: Raised Islands

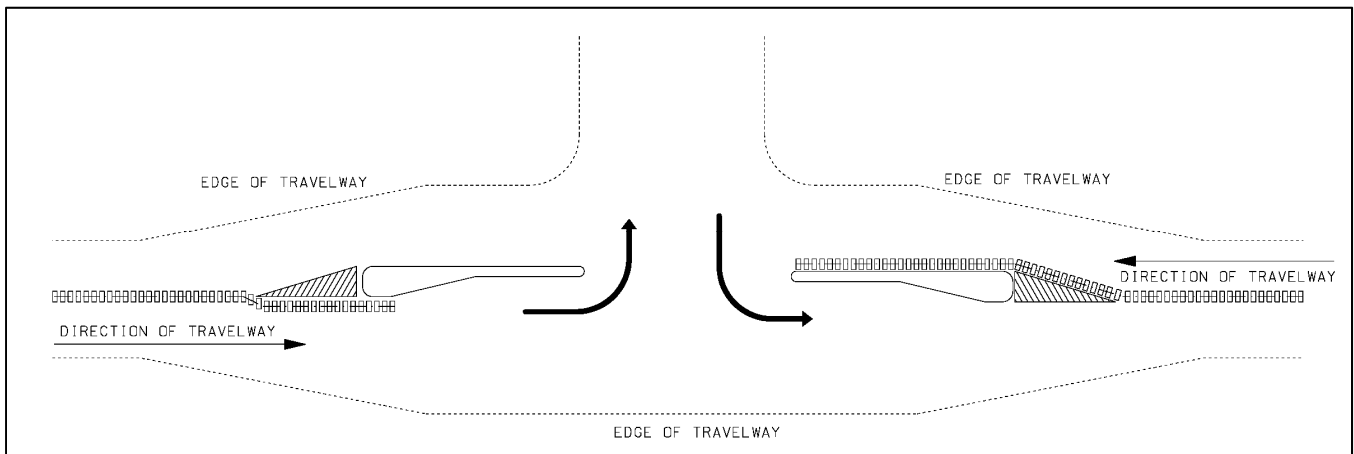


Figure 10 - Special Situations on Undivided Highways: Left Turn Lanes

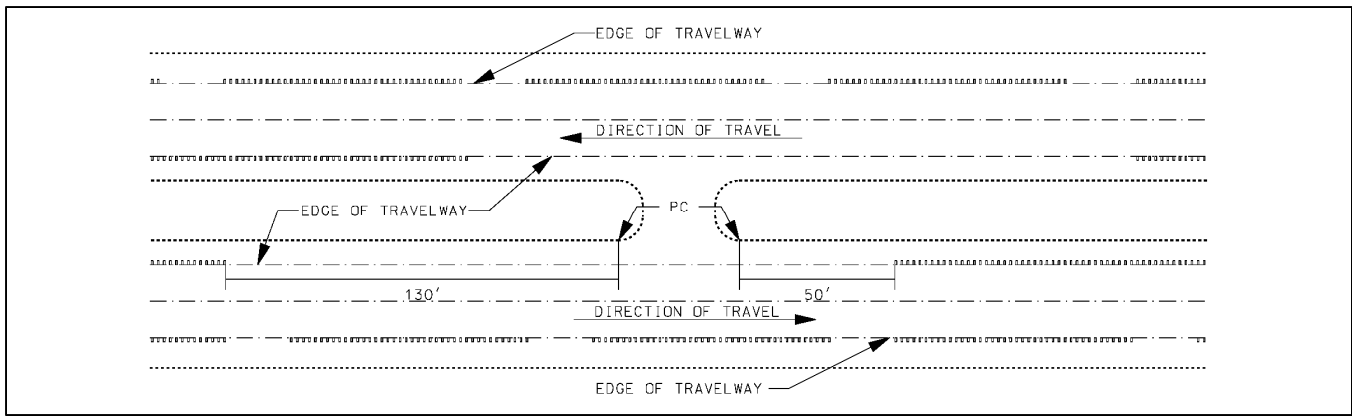


Figure 11 - Interstate & Divided Highways: Cross Overs

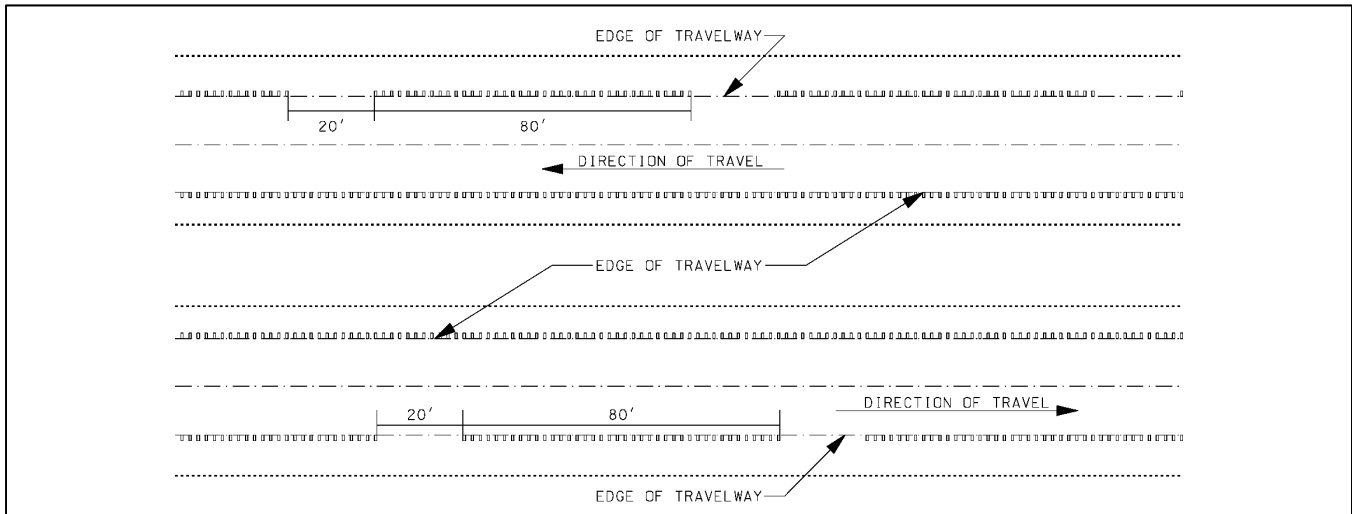


Figure 12 - Interstate & Divided Highways: Standard Divided Highways

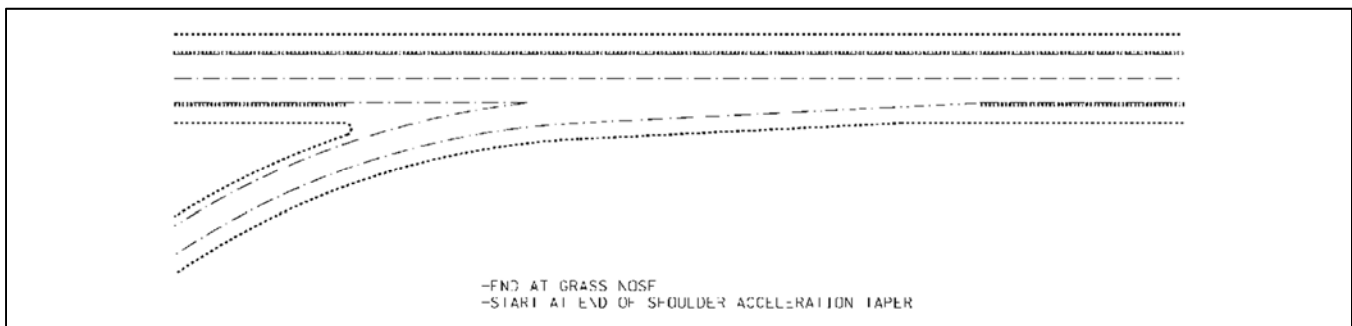


Figure 13 - Interstate & Divided Highways: On Ramp Placement

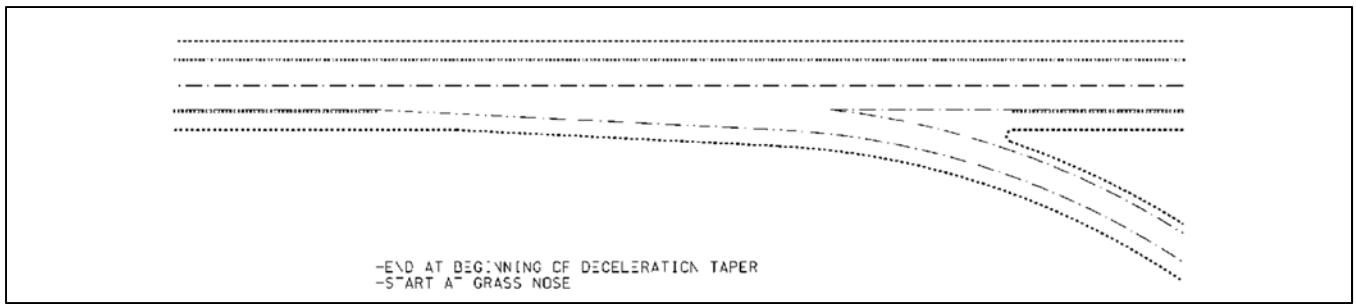


Figure 14 - Interstate & Divided Highways: Off Ramp Placement