



STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
DESIGN DIVISION
NASHVILLE, TENNESSEE 37243-0348

INSTRUCTIONAL BULLETIN NO. 10-11

Regarding Concrete Shoulder Rumble Strip Item Number

Effective immediately, Section 4-411.03 Rumble Strips, located in the Section 4, Chapter 4, page 4-45 and Note 7 of Table 4-3 (Sheet 4 of 4) on page 4-81 are revised to replace existing item number with the item number **501-03.10, Concrete Shoulder Rumble Strips, L.F.** Revised pages are attached to replace the existing sheets in your Design Guidelines Book..

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CS:ARH

4-411.02 RAISED BITUMINOUS RUMBLE STRIPS

Raised bituminous rumble strips are a traffic warning device. Raised bituminous rumble strips will require a detail to be furnished in the plans. This type of rumble strip is to be used for warning or unexpected stop conditions and shall not be used routinely as a shoulder treatment. At approaches to narrow bridges, where the shoulder width is less than the normal roadway shoulder width, the raised bituminous rumble strip may be used to warn the motoring public of this roadway condition.

4-411.03 RUMBLE STRIPS

Scored rumble strips are a traffic warning device, and when required, shall be constructed in accordance with Standard Drawings T-M-15 and T-M-15A or as shown on the plans. Raised bituminous rumble strips and scored rumble strips are the two types of rumble strips normally used in Tennessee.

Scored rumble strips and scored rumble stripes provide an audible warning to vehicles leaving the travel lane. Unlike a scored rumble stripe which is placed at the edge line location, a scored rumble strip is placed on the shoulder adjacent to the travel lane and edge line.

Refer to Section 4-716.15 for guidelines for placement of rumble strips on shoulders. Scored shoulders will be constructed on asphalt or concrete shoulders. Asphalt shoulders must have a minimum depth of pavement of one and one-half inches. Scored shoulders should also be omitted adjacent to ramps, acceleration and deceleration lanes including tapers and along the radius of side road approaches, entrances and median crossovers.

Rumble strips shall be specified on all new construction and resurfacing projects on the Interstate System and access controlled state routes. Both the inside and the outside shoulders shall be scored. The scored rumble strip shall be constructed in accordance with Standard Drawing T-M-15. Rumble strips are to be paid for under Item No. 411-12.01, Scoring Shoulders (Continuous) (16 inch Width), L.M. For estimating purposes, the item will be measured longitudinally along the edge of each shoulder and will usually be four (4) times the project length less deductions for entrance and exit ramps, public roads, and bridges. When concrete shoulders are present rumble strips are to be constructed in accordance with Standard Drawing RP-CS-1 or RP-CS-2. Rumble strips on concrete shoulders shall be paid for under Item No. 501-03.10, Concrete Shoulder Rumble Strips, L.F. The item will be measured as the actual length of pavement scored along each shoulder.

Refer to Section 4-716.15 for guidelines for placement of rumble strips on non-access controlled state routes. When rumble strips are placed on non-access controlled routes, paved shoulders should be 8ft. or wider. A 30 foot rumble will be followed by a 10 foot gap in the rumble to allow for bicycles to cross without having to traverse the rumble strip. Rumble strips should normally only be placed on rural routes with posted speeds of 45 mph or greater. Rumble strips may be used on urban routes where accident history or other factors warrant the placement. When placed on urban routes, designers should give consideration to expected bicycle traffic and noise generated. The scored rumble strip shall be constructed in accordance with Standard Drawing T-M-15A. Rumble strips are to be paid for under Item No. 411-12.02, Scoring Shoulders (Non-continuous) (16 inch Width), L.M. The item will be measured and paid as the actual length of pavement scored along each shoulder. Rumble strips should be omitted on shoulders adjacent

to designated bike lanes and may also be omitted from locations recommended by the TDOT bicycle coordinator.

4-411.04 RUMBLE STRIPES

Rumble stripes are a traffic warning device, and when required, shall be constructed in accordance with Standard Drawing T-M-16. A scored rumble stripe is a scored rumble placed along the outside edge line of the travel lane with the edge line placed along the scored rumble.

Refer to Section 4-716.15 for guidelines for the placement of rumble stripes. Rumble strips should normally only be placed on rural routes with posted speeds of 40 mph or greater. The rumble stripe shall consist of a 30 foot scored rumble followed by a 10 gap to allow for bicycles to cross without having to traverse the rumble. Rumble stripes may be used on urban routes where accident history or other factors warrant the placement. When placed on urban routes, designers should give consideration to expected bicycle traffic and noise generated.

Scored rumble stripes are to be paid for under Item No. 411-12.03, Scoring for Rumble Stripe (Non-Continuous) (8 inch Width), L.M. or Item No. 411-12.04, Scoring for Rumble Stripe (Non-Continuous (4 inch Width), L.M. The item will be measured and paid as the actual length of pavement scored along each shoulder.

When rumble stripes are specified, pavement markings shall be Spray Thermoplastic (60 mil). Enhanced Flatline Thermoplastic Markings shall not be used. Striping is to be paid for under the appropriate pavement marking item number. Rumble stripes should be omitted on shoulders adjacent to designated bike lanes and may also be omitted from locations recommended by the TDOT bicycle coordinator.

4-411.05 RIDEABILITY SPECIFICATIONS

For all projects having asphaltic concrete surface Grading "D", a determination shall be made as to whether or not the rideability specification shall be included in the contract. This determination will be made by the State Construction Office after the plans have been submitted.

4-414.05 COMPUTATIONS FOR MICRO-SURFACING

Item No. 414-03.01 Emulsified Asphalt for Micro-Surfacing

$$0.12 \times \text{Below aggregate quantity} = \text{Tons}$$

NOTE: Application rate based on 12 percent of the dry weight of the aggregate.

Item No. 414-03.02 Aggregate for Micro-Surfacing

$$\frac{\text{Surface area (Sq. Yd.)} \times \text{XX Lb./ Sq. Yd.}}{2,000 \text{ Lb./ Ton}} = \text{Tons}$$

NOTE: Application rate of 30 pounds (approximate depth 0.375") per square yard shall be used if plans require a leveling mixture (14 pounds per square yard) and a surface

**Permanent Pavement Markings, Raised Pavement Markers,
Rumble Strip and Rumble Stripe Guidelines Notes**

1. The contractor may elect to use either thermoplastic or preformed plastic for specialty striping items. These items include stop lines, cross walks, arrows, words, channelization, and other specialty striping items except lines.
2. The following footnote shall be added to all Specialty Striping Items: **“The contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”**
3. Specialty striping items may be either paint or thermoplastic.
4. Due to increased plowing considerations, snowplowable raised pavement markers (SRPM's) should be used in Claiborne, Sullivan, Carter, Cumberland, Putnam, Overton, Montgomery, Robertson, Sumner, Henry, Obion, and Weakley Counties instead of raised pavement markers. Bi-directional snowplowable raised pavement markers raised pavement marker (reflector on both sides) shall be paid for under Item No. 716-01.21, Snowplowable Pvmt Mrkrs (Bi-Dir) (1 Color), Each. Mono-directional snowplowable raised pavement markers (reflector on one side only) shall be paid for under Item No. 716-01.22, Snowplowable Pvmt Mrkrs (Mono-Dir) (1 Color), Each. Refer to T-M-series standard drawings for details. Three lane and multilane roads with 2-way traffic will normally require both mono-directional and bi-directional raised pavement markers. Two lane roads will normally require bi-directional raised pavement markers.
5. Rumble strips are not required on ramps.
6. Bi-directional raised pavement marker (reflector on both sides) shall be paid for under Item No. 716-01.11, Raised Pvmt Markers (Bi Directional) (1 Color Lens), Each. Mono-directional raised pavement markers (reflector on one side only) shall be paid for under Item No. 716-01.12, Raised Pvmt Markers (Mono-Directional) (1 Color Lens), Each. Refer to T-M-series standard drawings for details. Three lane and multilane roads with 2-way traffic will normally require both mono-directional and bi-directional raised pavement markers. Two lane roads will normally require bi-directional raised pavement markers.
7. For concrete shoulders, the rumble strip is to be placed in accordance with standard drawings RP-CS-1 or RP-CS-2. Item No. 501-03.10, Concrete Shoulder Rumble Strips, L.F. Length of scoring shall be measured as the actual length of pavement scored.
8. When Rumble Stripes are not used Pavement Markings should be 4" Enhanced Flatline Pavement Markings. Item No. 716-12.01, Enhanced Flatline Thermo Pvmt Mrkng (4 In Line), L.M.
9. See 4-411.03 and 4-411.04 for additional guidance regarding rumble strip and rumble stripe placement.

Table 4-3 (Sheet 4 of 4)

4-716.16 STRIPING RAMPS ON RESURFACING PLANS

In the process of preparing plans for construction or resurfacing projects involving roadways that abut connecting ramps, consideration shall be given to striping these ramps. When work is not being done on the entire ramp, this ramp would not normally be re-striped beyond where the work is being done. The roadway designer shall contact the Regional Traffic Engineer to determine the need to re-stripe these ramps in their entirety. Stop bars, turn lane arrows and other pavement instructive markings may be included at the discretion of the Regional Traffic Engineer applying the appropriate standard drawings that shall be included in the plans. The decision to re-stripe shall be made based on the condition of the pavement markings and consideration may be given to compliance with the standards. If this striping is done, the ramps shall be marked using current standards for pavement markings as shown on Standard Drawings T-M-6 and T-M-9 and other appropriate standard drawings and marked up to the connecting roadway. Add the following to the plans:

“Ramps shall be marked up to where they connect to the intersecting roadway.”

4-716.17 STRIPING ON MICRO SURFACE PAVEMENTS

Pavement markings on micro surface pavements should follow guidance provided in Table 4-3 for lane lines and edge lines.

4-716.20 PAVEMENT MARKING GENERAL NOTES FOR ROADWAY PLANS

See section 6-145.00 for General Pavement Marking Notes.

4-716.25 SPECIALTY PAVEMENT MARKINGS

Contractors will have the option of using either Thermoplastic or Preformed Plastic Pavement Markings specialty markings. For plan development and bidding purposes, designers will use the appropriate Thermoplastic Pavement Marking items numbers. All specialty pavement marking item numbers shall be footnoted:

“Contractor may elect to substitute Preformed Plastic for Thermoplastic. Preformed Plastic shall be paid for at the same unit price as bid for Thermoplastic.”

On projects where plastic specialty pavement items are being used, the following items will be used:

1. Crosswalk with longitudinal lines as shown on Standard Drawing T-M-4 will use the following pay item:

716-02.09, Plastic Pavement Marking (Longitudinal Cross-walk) per linear foot.

The measurement for this marking is identical to that for standard crosswalk, for example, one measurement along the centerline of the crosswalk (perpendicular to curbs).