

808-T-190 LONGITUDINAL RUMBLE STRIPES

(Adopted 05-16-13)

The Standard Specifications are revised as follows:

SECTION 401, BEGIN LINE 458, DELETE AND INSERT AS FOLLOWS:

401.17 ~~Shoulder~~Pavement Corrugations

~~Shoulder~~Pavement corrugations shall be in accordance with 606.

SECTION 402, BEGIN LINE 81, DELETE AND INSERT AS FOLLOWS:

402.07 Mix Criteria

(a) Composition Limits for HMA *Transverse* Rumble Strip Mixtures

Transverse ~~R~~umble strip mixtures shall be type A surface in accordance with 402.04. A MAF in accordance with 402.05 will not apply. Aggregate requirements of 904.03(d) do not apply.

SECTION 402, BEGIN LINE 278, DELETE AND INSERT AS FOLLOWS:

Transverse ~~R~~umble strips shall be placed to ensure uniformity of depth, width, texture, and the required spacing between strips. A tack coat in accordance with 406 shall be applied on the pavement surface prior to placing the mixture. The tack coat may be applied with a paint brush or other approved methods.

SECTION 402, BEGIN LINE 346, DELETE AND INSERT AS FOLLOWS:

Transverse ~~R~~umble strips shall be compacted with vibratory compacting equipment in accordance with 409.03(d)7 unless otherwise stated.

SECTION 402, BEGIN LINE 395, DELETE AND INSERT AS FOLLOWS:

402.17 ~~Shoulder~~Pavement Corrugations

~~Shoulder~~Pavement corrugations shall be in accordance with 606.

SECTION 402, BEGIN LINE 425, INSERT AS FOLLOWS:

HMA *Transverse* Rumble Strips LFT

SECTION 501, BEGIN LINE 372, DELETE AND INSERT AS FOLLOWS:

501.24 ~~Shoulder~~Pavement Corrugations

~~Shoulder~~Pavement corrugations shall be in accordance with 606.

SECTION 502, BEGIN LINE 359, DELETE AND INSERT AS FOLLOWS:

502.19 ~~Shoulder~~Pavement Corrugations

~~Shoulder~~Pavement corrugations shall be in accordance with 606.

SECTION 606, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 606 – ~~SHOULDER~~PAVEMENT CORRUGATIONS

606.01 Description

(a) All Corrugations

This work shall consist of placing corrugations in the ~~paved-shoulders~~pavement in accordance with 105.03. Corrugations shall not be constructed within the limits of reinforced concrete bridge approaches or in bridge decks.

The operation shall be coordinated such that milled materials do not encroach on the pavement lanes carrying traffic and all milled materials are disposed of in accordance with 104.07. *When corrugations are installed for center line and edge line rumble stripes, milled materials shall be swept and vacuumed following the milling operation.*

The corrugation shall be constructed by cutting smooth strips in existing or newly constructed ~~shoulders~~ *pavement*. The operation shall be conducted by means of a cutting machine that provides a series of smooth cuts without tearing or snagging. The equipment shall include guides to maintain uniformity and consistency in the alignment of the strips.

Longitudinal rumble stripes are the combination of either the center line pavement marking placed in the center line corrugation or the edge line pavement marking placed in the edge line corrugation. They shall be installed as shown in the plans and as specified herein.

(b) Center Line and Edge Line Corrugations

When corrugations are installed for center line and edge line rumble stripes control points that are required as a guide for milling corrugations shall be spotted with paint for the full length of the road to be milled. Control points along tangent sections shall be spaced at a maximum interval of 100 ft. Control points along curve sections shall be spaced to ensure the accurate location of the milled corrugations. The location of control points shall be approved prior to the milling operations.

If snowplowable raised pavement markers exist where center line corrugations are being placed into the existing surface, the prismatic reflectors in these markers shall be removed and corrugations gapped a maximum of 60 in. and not within 6 in. of the markers.

In the presence of D-1 pavement joints or castings which conflict with the location of the corrugations, the corrugations shall be gapped a maximum of 5 ft and not within 6 in. of the joint or casting.

Corrugations installed within the HMA traveled way and on HMA shoulder contiguous with a HMA traveled way or a HMA auxiliary lane shall be sealed using liquid asphalt sealant in accordance with 401.15.

1. Installation Tolerances

Lateral deviation of milled center line or edge line corrugations shall not exceed 1 in. in 100 ft. The alignment of all pavement markings placed within rumble stripes shall be $\pm 1/2$ in. of its specified location.

2. Maintenance of Traffic

The rumble stripe traffic control procedures shall be submitted to the Engineer and shall be in accordance with 808.08. Vehicles used in performing the milling, sweeper, vacuum or sealing operations shall have a rear escort vehicle that follows at a distance of 100 to 500 ft.

606.02 Method of Measurement

HMA and PCCP ~~shoulder~~ *pavement* corrugations will be measured by the linear foot, measured parallel to the center line of the roadway. Gaps in PCCP ~~shoulder~~ *pavement* corrugations at the D-1 joints will be included in the milled PCCP corrugations. *Gaps in pavement corrugations for castings will be included in the milled corrugations.*

606.03 Basis of Payment

HMA and PCCP ~~shoulder~~ *pavement* corrugations will be paid for at the contract unit price per linear foot, when specified.

Payment will be made under:

Pay Item	Pay Unit Symbol
Milled HMA Shoulder Corrugations	LFT
Milled PCCP Shoulder Corrugations	LFT

The cost of removal of existing prismatic reflectors in rumble strip retrofit sections shall be included in the cost of the pay items.

Milling, sweeping, vacuum cleaning, operation protection and maintenance of traffic associated with these pay items and all necessary incidentals shall be included in the cost of the pay items.

Where corrugations are placed in an existing HMA surface, liquid asphalt sealant shall be included in the cost of the pay items.

SECTION 808, BEGIN LINE 53, INSERT AS FOLLOWS:

808.04 Longitudinal Markings

All longitudinal lines shall be clearly and sharply delineated, straight and true on tangent, and form a smooth curve where required. Lines shall be square at both ends, without mist, drip or spatter.

A solid line shall be continuous. A broken line shall consist of 10 ft line segments with 30 ft gaps.

All lines shall be gapped at intersections unless otherwise specified or directed.

The actual repainting limits for no-passing zone markings will be determined by the Engineer.

A new broken line placed over an existing broken line shall laterally match the existing broken line, and the new line segments shall not extend longitudinally more than 10% beyond either end of the existing line segments.

(a) Center Lines

Center lines shall be used to separate lanes of traffic moving in opposite directions. All center line markings shall be yellow in color and 4 in. in width. They shall

be placed such that the edge of the marking, nearest to the geometric centerline of the roadway, shall be offset 4 in. from the geometric centerline.

The center line of a multi-lane roadway shall be marked with a double solid line. The 2 lines forming the double solid line shall be spaced 8 in. apart and shall be equally offset on opposite sides of the geometric centerline.

The center line of a 2-lane, 2-way roadway, where passing is allowed in both directions, shall be marked with a broken line.

The center line of a 2-lane, 2-way roadway, where passing is allowed in 1 direction only, shall be marked with a double line, consisting of a broken line and a solid line. The broken line and the solid line shall be spaced 8 in. apart and shall be equally offset on opposite sides of the geometric centerline. The solid line shall be offset toward the lane where passing is prohibited. The broken line shall be offset toward the lane where passing is permitted.

The center line shall be placed within the milled corrugation when center line rumble stripes are specified. Placement of the center line marking in the milled corrugation does not alter the pavement marking performance requirements of section 808.07.

(b) Lane Lines

Lane lines shall be used to separate lanes of traffic moving in the same direction. Normal lane line markings shall be white in color and shall be 5 in. wide on freeways, interstates and toll roads, and 4 in. wide on all other roads. They shall be offset 4 in. to the right of longitudinal pavement joints or divisions between traffic lanes. Normal lane lines shall be marked with white broken lines. White solid lines shall be used to mark lane lines only when specified or directed.

(c) Edge Lines

Edge lines shall be used to outline and separate the edge of pavement from the shoulder. Edge line markings shall be 4 in. in width and shall be placed such that the edge of the marking nearest the edge of the pavement shall be offset 4 in. from the edge of the pavement except as otherwise directed. Right edge lines shall be marked with a white solid line and left edge lines shall be marked with a yellow solid line.

The edge line shall be placed in the milled corrugation when edge line rumble stripes are specified. Placement of the edge line marking in the milled corrugation does not alter the pavement marking performance requirements of section 808.07.

(d) Barrier Lines

Barrier lines shall be used as specified or directed. Barrier line markings shall be solid lines of the size and color specified or as directed.

(e) Markings in Retrofitted Corrugations

In sections where corrugations are being placed in the existing surface all existing pavement markings shall be removed in accordance with 808.10 and any existing

sealants shall be routed or grinded out. Temporary pavement markings placed in accordance with 801.12 shall be offset a sufficient distance from the longitudinal joint so as to not obstruct the installation of the corrugations or the application of the liquid asphalt sealant.

The Contractor shall make a record of the existing pavement marking locations so that such markings may be replicated later with the appropriate adjustments for edge line rumble stripes. This record shall show longitudinal and transverse dimensions. The record shall be submitted to and approved by the District Traffic Engineer prior to the removal of existing pavement markings. The District Traffic Section shall be notified two weeks prior to applying pavement markings so as to allow the District Traffic Section to verify the pavement marking plan.
