

## Section 2548. Milled Shoulder Rumble Strips - HMA or PCC Surface

### 2548.01 GENERAL.

Provide equipment, furnish all necessary labor and materials, and perform all operations necessary for milling shoulder rumble strips in HMA or PCC surfaced shoulders. Mill shoulder rumble strips to the dimensions and spacing shown in the contract documents. Apply diluted asphalt emulsion to the milled shoulder rumble strips on HMA surfaced shoulders by means of a bituminous distributor.

### 2548.02 MATERIALS.

#### A. Milling.

Equip milling equipment with a cutting head having cutting tips arranged in a pattern as to provide a smooth cut, approximately 1/16 inches (2 mm) between peaks and valleys.

#### B. Asphalt Emulsion Fog Seal.

1. Use asphalt emulsion Grade CSS-1h, meeting requirements of [Section 4140](#).
2. Dilute the asphalt emulsion with water prior to application to the milled shoulder rumble strip. The dilution rate is one part of asphalt emulsion to one part of water.

### 2548.03 CONSTRUCTION.

Notify the Engineer if degraded shoulders are encountered that will not accommodate milled rumble strips. Skip those sections.

#### A. Test Strip.

Demonstrate to the Engineer on an initial 500 foot (150 m) test section that the equipment and method will provide the desired milled shoulder rumble strip and surface inside each depression without damaging the adjacent pavement. If the desired results are not being provided, as determined by the Engineer, provide different equipment or methods, or make necessary adjustments to provide the desired results. If the initial 500 foot (150 m) section results are unsatisfactory, repair or replace the section as determined by the Engineer, at no additional cost to the Contracting Authority.

#### B. Milling.

1. Mill shoulder rumble strips in a straight line, offset from the painted edge line as shown in the contract documents. Do not deviate from that offset more than  $\pm 2$  inches (50 mm). The offset may be decreased to 6 inches (150 mm) on shoulders with a top width less than 30 inches (750 mm). Ensure the depth of the rumble strips is as shown in the contract documents. The Engineer will randomly check the alignment and depth.
2. Remove waste material (millings) resulting from the operation on a daily basis. The waste material may be used as fillet material adjacent to the paved shoulder or it may become property of the Contractor and disposed of off the project. Disposal of material may be at an approved landfill or approved stockpile, or by other methods that will allow the material to be recycled. Remove waste material prior to opening adjacent lane to traffic.

#### C. Asphalt Emulsion Fog Seal.

1. Ensure the equipment meets the requirements of [Section 2001](#).
2. Ensure the application width covers the entire milled shoulder rumble strip.
3. Place the diluted asphalt emulsion fog seal according to [Article 2308.03, D](#), at a rate of 0.13 gallon per square yard (0.6 L/m<sup>2</sup>).
4. Do not place asphalt emulsion on a damp or wet surface.
5. Apply asphalt emulsion during weather conditions under which satisfactory application can be obtained. Do not apply asphalt emulsion when the air temperature is below 50°F (10°C). Do not place asphalt emulsion after October 15 without the Engineer's permission.

**D. Limitations.**

Do not disturb desirable grass areas and desirable trees outside the construction limits. Do not park or service vehicles and equipment or use these areas for storage of materials. Obtain the Engineer's approval for storage, parking, and service areas.

**2548.04 METHOD OF MEASUREMENT.**

Measurement will be as follows:

**A. Milled Shoulder Rumble Strips.**

Stations (meters) shown in the contract documents, measured along each edge of mainline pavement abutting a paved shoulder. Unless stated otherwise in the contract documents, no deduction will be made for gapped areas. The quantity will be adjusted for the length of degraded shoulders skipped, as defined in [Article 2548.03](#) of this specification. The quantity will be adjusted for test sections that were deemed unsatisfactory.

**B. Asphalt Emulsion for Fog Seal.**

Gallons (liters) as provided in [Article 2307.04, B](#).

**2548.05 BASIS OF PAYMENT.**

Payment will be the contract unit price as follows:

**A. Milled Shoulder Rumble Strips.**

Per station (meter) for the type specified.

**B. Asphalt Emulsion for Fog Seal.**

1. Per gallon (liter) for undiluted Asphalt Emulsion for Fog Seal that is mixed and used on the project. Diluted asphalt emulsion that is delivered to the project site, but not applied to the roadway surface will not be considered for payment.
2. Payment is full compensation for cleaning the shoulder surface, furnishing and applying diluted asphalt emulsion, mixing water, and protecting the adjacent pavement and edge lines.