2016 Design Standards
Traffic Standards

Roadway Design Office Updates
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INDEX 518

N55
RIGID PAVEMENT WITH FLEXIBLE PAVEMENT SHOULDER

ISOMETRIC - LONGITUDINAL CUT
INSET A

N55
RIGID PAVEMENT WITH RIGID PAVEMENT SHOULDER

ISOMETRIC - LONGITUDINAL CUT (RIGID PAVEMENT)
INSET B
Index 518

Lanes

Shoulder 12'-0" 12'-0" Shoulder

Profiled Thermoplastic Markings

See INSET B

NTS

RIGID PAVEMENT WITH RIGID PAVEMENT SHOULDER

Concrete Shoulder Pavement

Edge of Travel Lane

Profiled Thermoplastic Markings

ISOMETRIC - LONGITUDINAL CUT (RIGID PAVEMENT)

INSET B
Index 519 in RDB 15-03

**General Notes:**

1. Rumble strip consists of a ground-in rumble strip with a painted marking applied over the strip. Construct ground-in rumble strips centered on the divided center line or edge line markings in accordance with specifications.

2. The rumble strip depth detailed on this sheet is for use on dense-graded flexible pavement only.

3. Use the Skip Array Rumble Strip for edge line rumble striping and use the Continuous Array Rumble Strip for center line rumble striping.

4. Remove raised retroreflective pavement markers when in conflict with the installation of center line rumble strip grinding operations. The cost of removal is included in the cost of the rumble strip.

5. Replacement of retroreflective pavement markers which were removed during the installation of center line rumble strip grinding operations will be paid for under Pay Item 710.

6. An extra application of paint is required within 24 hours of each day's grinding operation. Payment for the extra application of paint is not included in 710-90 and will be paid for under the appropriate 710 pay item structure.

7. The quantity of center line and edge line ground-in rumble strips will be determined by the contractor and approved. No deduction will be made when the Skip Array is used.
GENERAL NOTES:

1. Rumble Striping consists of a ground-in rumble strip with a pavement marking applied over the strip. Construct ground-in rumble strips centered on the proposed center line or edge line markings in accordance with Specification Section 546.

2. The rumble strip depth detailed on this sheet is for use on dense-graded flexible pavement only.

3. Use the Skip Array Rumble Strip for edge line rumble striping and use the Continuous Array Rumble Strip for center line rumble striping.

4. Remove raised retroreflective pavement markers when in conflict with the installation of center line rumble strip grinding operations. The cost of removal is included in the cost of the rumble strip.

5. Replacement of retroreflective pavement markers which were removed during the installation of center line rumble strip grinding operations will be paid for under Pay Item 706.

6. An extra application of paint is required within 24 hours of each day's grinding operation. Payment for the extra application of paint is not included in 710-90 and will be paid for under the appropriate 710 pay item structure.

7. The quantity of center line and edge line ground-in rumble strips will be the length in net miles constructed and accepted. No deduction will be made when the skip array is used.
710-4.1.1 Painted Pavement Marking (Final Surface):

When permanent pavement markings are placed on newly constructed asphalt with rumble striping,

• apply two applications of standard paint,

• one application of Class D retroreflective pavement markers, if applicable,

• and one application of Class B retroreflective pavement markers.

• For center line rumble striping installations, install Class D retroreflective pavement markers, remove them prior to grinding, and install Class B retroreflective pavement markers on the non-ground surface after grinding.
710-4.1.1 Painted Pavement Marking (Final Surface):

When permanent pavement markings are placed on newly constructed asphalt with rumble striping,

- apply two applications of standard paint,
- one application of Class D retroreflective pavement markers, if applicable,
- and one application of Class B retroreflective pavement markers.
- For center line rumble striping installations, install Class D retroreflective pavement markers, remove them prior to grinding, and install Class B retroreflective pavement markers on the non-ground surface after grinding.
Class D RPM’s
Index 519 in 2016 DSeB

**CENTER LINE RUMBLE STRIPING**

**ISOMETRIC - LONGITUDINAL CUT**

**EDGE LINE RUMBLE STRIPING**

**ISOMETRIC - LONGITUDINAL CUT**

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**GENERAL NOTES:**

1. Construct ground-in rumble strips centered on the proposed centerline or edge line markings in accordance with Specification Section 546.
2. The rumble strip depth detailed on this sheet is for use on dense-graded flexible pavement only.
3. Use the Skip Array Rumble Strip for edge line rumble striping and use the Continuous Array Rumble Strip for center line rumble striping.
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PAVEMENT ARROW AND MESSAGE DETAILS

PAVEMENT ARROW AND MESSAGE DETAILS NOTE: When arrow and pavement message are used together, the arrow shall be placed to the left of the pavement message and shall be separated from the pavement message by a distance of 2'. The end of the arrow to the base of the message. Stop message shall be placed 25' back of stop line.

Dimensions are within 1/8".

Solid Edge Line or Lane Line

Solid Channelizing Line

Two-Lane Passing Prohibited Lines

Dotted Solid Lines

12' Solid Pedestrian Crosswalk Line

24' Solid Stop Line

2' - 4 Dotted Guide Line

6' - 10 Dotted Extension Line

3' - 9 Dotted Lane Drop Line

10' - 30' Skip Line

Yield Lines consist of five 18" x 27" white triangles which face traffic. Equally space triangles within travel lane. Add additional yield in when a bike lane is present.

TYPES OF PAVEMENT MARKING LINES

CONTRAST MARKINGS

10' White Dots with 20' Black Contrast and 20' Dots

10' Black Contrast

YIELD LINES

SPECIAL MARKING AREAS

2016 DESIGN STANDARDS

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10' White Skip With 10'
Black Contrast and 20' Gaps

10' Black Contrast

CONTRAST MARKINGS
Index 17346

TYPICAL RURAL INTERSECTION WITHOUT TURN Lanes

TYPICAL RURAL INTERSECTION WITH TURN Lanes

GENERAL NOTES:
1. Remove raised retroreflective pavement markers when in conflict with the installation of the centerline profiled thermoplastic pavement markings. The cost of removal is included in the cost of the profiled thermoplastic pavement marking.
2. Replacement of retroreflective pavement markers removed during the installation of the centerline profiled thermoplastic pavement markings will be paid for under Pay Item 726.

PROFILED THERMOPLASTIC MARKINGS
2 LANE CONCRETE ROADWAYS

SPECIAL MARKING AREAS

2016 DESIGN STANDARDS

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SHEET NO. 13 of 14
## Rumble Striping Details

### Complete eBooklet

*(252mb)*

2016 Design Standards eBooklet

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### Turn Lanes - Curbed and Uncurbed Medians

#### Urban Conditions
- **Design Speed (mph):**
  - 35
  - 40
  - 45
  - 50
  - 60

- **Queue Distance:**
  - 75
  - 80
  - 85
  - 100
  - 120

- **Minimum Clearance Distance:**
  - 100
  - 120
  - 160

- **Median Width:**
  - 130

#### Rural Conditions
- **Design Speed (mph):**
  - 20
  - 30

- **Queue Distance:**
  - 260
  - 290

#### Arrow Spacing

1. **1 Arrow (less than 100):**
   - 20
   - 25
   - 29

2. **2 Arrows (100 to 150):**
   - 24
   - 28

3. **3 Arrows (150 to 200):**
   - 28
   - 32

#### Double Left Turn Markings
- **Through Lane Becomes Exclusive Left Turn:**
  - 25
  - 29

- **Through Lane Becomes Optional Left Turn:**
  - 25
  - 29

### Notes:
1. The 'Begin Lane Line' locations are based on the standard lengths shown in Design Standard 301. These locations must be adjusted on a case-by-case basis for turn lanes not meeting the standard lengths.
2. Yellow left turn edge marking may be used adjacent to raised curb or grass medians if lane use is not readily apparent to drivers approaching a left turn storage lane.
3. Refer to Design Standard Index 301 for Roadway Details.
4. This index applies to right turn lanes.
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Bi-Directional White/Red RPM's
Install Markers At 20' Center To Center

Bidirectional White/Red

1"
Index 17502

ELEVATION

Identification Tag (see Note #4E)
Handhole Door

Base Plate
Wire screen
2'-0" Min.

Natural Ground Line adjacent to highmasts on Fill

Splice Length (2) Telescopic Field Joints
Length Section (n)

Fill Height
25 Maximum

Drilled Shaft

4 1 (Max. Slope)
Index 17723

Clamp Spacing Based On Sag For Longest Span (See Signalization Plans)

Pole Top (See Sheet 3)

Catenary Wire Clamp (See Sheet 3)

2" Pipe For Wire Entrance (See Sheet 3)

9"

Q Pole

r (Typ.)
Questions

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