



# INDIANA DEPARTMENT OF TRANSPORTATION

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### **Design Memorandum No. 15-19** **Technical Advisory**

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**TO:** All Design, Operations, and District Personnel, and Consultants

**FROM:** /s/ David Boruff  
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**SUBJECT:** Durable Pavement Markings used for Longitudinal Lines

**REVISES:** Indiana Design Manual Section 502-2.01(03) and Figure 502-2C

**EFFECTIVE:** Contracts let on or after January 1, 2016

Beginning with contracts on the January 2016 letting, durable pavement marking materials for all longitudinal lines should be specified only for highways with an AADT of 10,000 or greater and where the pavement surface is expected to be in place at least 8 years. Durable materials include thermoplastic, preformed plastic, and multi-component (epoxy). Paint should be specified when either of these criteria is not met, when the marking is used with rumble stripes, or with a thin pavement preservation treatment.

When durable materials are specified for longitudinal lines, except on bridge decks and reinforced concrete bridge approaches (RCBAs), the lines must be grooved. The pavement recess created by grooving is intended to extend the service life of the marking by reducing the likelihood for snow plow damage and by improving adherence to the pavement surface.

Recurring special provision (RSP) 808-T-210 should be called for beginning with the January 2016 letting. The RSP contains construction and performance requirements for grooved durable markings as well as warranty information for both grooved and surface-applied durable markings. A separate pay item for grooving is required when pavement markings that must be grooved are specified. The pay item is 808-12032 GROOVING FOR PAVEMENT MARKINGS (LFT).

Revisions to the Indiana Design Manual are an attachment to this memo. Please contact the Office of Traffic Administration with any questions or if additional background information is needed.

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## 502-2.01(03) Materials and Application [Rev. Sept. 2015]

The pavement marking materials and applications are described on Figure [502-2C](#). See the INDOT *Standard Specifications* for materials properties and application requirements during construction. The following provides additional guidance regarding the materials.

1. **Paint.** Paint-applied markings are less expensive than other materials. They are used where the additional cost of durable pavement markings cannot be justified. A short project length, by itself, does not prevent the use of durable markings materials. A disadvantage of paint is that it can be quickly worn away on a high-traffic-volume roadway. Therefore it often needs to be reapplied more than once a year. Paint should be used for longitudinal lines as follows:

- a. where the AADT is less than 10,000 vehicles; or
- b. where the remaining surface life of the pavement is less than eight years, or where the pavement is scheduled for resurfacing within eight years; or
- c. for marking non-mountable islands and raised curbs; or
- d. where rumble stripes are specified (either edge line, center line, or both); or
- e. on pavement surface treatments with a depth of less than 1.5 in. (e.g. Micro-surface, UBWC, 4.75 mm HMA Overlay, etc.).

2. **Durable Marking Materials.** Durable marking materials provide enhanced retro-reflectivity and a longer service life. The INDOT *Standard Specifications* require that longitudinal lines, other than on bridge decks and RCBA's, be grooved when durable materials are used. Longitudinal lines on bridge decks and RCBA's should be surface applied. The contractor will provide a warranty for both surface-applied and grooved durable markings which covers presence, retro-reflectivity, and color. This practice serves to protect the additional investment in durable markings. INDOT uses the following types of durable markings.

- a. **Thermoplastic.** Hydrocarbon and alkyd thermoplastic markings may be used on asphalt pavement under the following conditions.
  - i. **Longitudinal Lines.** These may be used for the center line, edge lines, or lane lines at a location that is not proposed or scheduled for resurfacing within the next eight years and where the AADT is in excess of 10,000 vehicles.

The use of thermoplastic should not be specified with longitudinal rumble

stripes unless directed by the district traffic engineer.

- ii. Transverse Markings. These may be used for transverse markings as shown in Figure [502-2C](#).
  - iii. Painting Cycles. These may be used on a road that requires two or more applications of paint lines per year.
  - iv. Decision Point. These may be used where there is a need for more-positive lane identification because of alignment, transitions, or channelization.
- b. Multi-Component. Multi-component markings may be used for the center line, lane lines, or edge lines. They are not typically used for transverse markings or for marking a non-mountable island or raised curb because of problems that can develop with the intermittent application and dry time. Multi-component markings may be used as follows:
- i. Longitudinal Lines. These may be used for the center line, edge line, or lane lines at a location that is not proposed or scheduled for resurfacing within the next eight years.
  - ii. Transverse Markings. Except for transverse crosshatch markings in gore areas or channelized turn lanes, multi-component material should not be used for transverse markings.
  - iii. Painting Cycles. These may be used on a road that requires two or more applications of paint lines per year.
  - iv. Decision Point. These may be used where there is a need for more-positive lane identification because of alignment, transitions, or channelization.
- c. Preformed Plastic. The criteria for multi-component markings are also applicable for permanent applications of preformed plastic markings. Temporary preformed plastic markings are used in a construction zone. Temporary preformed plastic markings should not be used for permanent applications.

Preformed plastic markings are more durable, and have retained retro-reflectivity, increased detection distance, and wet retro-reflectivity characteristics. However,

these markings are more expensive due to material and installation costs. A typical application is for lane lines on a divided highway where the life-cycle cost has been shown to be favorable.

3. Raised Pavement Markers. See Section [502-2.02\(12\)](#) through [502-2.02\(15\)](#) for information about the use of raised pavement markers.

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Application	Material Type				
	Paint	Thermoplastic	Multi-Component	Preformed Plastic	Raised Pavement Markers
AA DT	< 10,000;	≥ 10,000;	≥ 10,000;	≥ 20,000;	≥ 5000, 2-Lane;
Pavement Surface Life	or < 8 Years	and ≥ 8 Years	and ≥ 8 Years	and ≥ 8 Years	and ≥ 4 Years
Edge Lines	X	X	X	X	
Center Line	X	X	X	X	X
Transverse Markings	X	X			
Concrete Pavement	X		X	X	X
Asphalt Pavement	X	X	X	X	X

Notes:

1. Other applications or restrictions apply; see Section 502-2.01(03) for additional information.
2. For guidance on the use of milled longitudinal rumble stripes in place of raised pavement markers, see Section 502-2.09.
3. Snowplowable RPM's should be used to supplement lane lines on roadways with a functional classification of interstate (1), freeway or expressway (2), or other principal arterial (3).

RECOMMENDED PAVEMENT MARKING APPLICATION

Figure 502-2C