

## SECTION 960—HOT THERMOPLASTIC PAVEMENT MARKINGS

**960.1 DESCRIPTION**—This work is the furnishing and installation of hot thermoplastic pavement markings, of the indicated type and color with a surface application of glass beads.

### 960.2 MATERIAL—

(a) **General.** Provide materials from a source listed in [Bulletin 15](#). Certify materials as specified in [Section 106.03\(b\)3](#).

(b) **Thermoplastic.** AASHTO M 249. Provide a material listed in [Bulletin 15](#).

(c) **Glass Beads.** [Section 1103.14](#), Type A

1. **Intermix.** Provide sufficient uncoated glass beads to comprise 40% of the marking material by mass (weight).
2. **Surface-applied.** Moisture resistant coated with a maximum of 5% passing the 180  $\mu\text{m}$  (No. 80) sieve and a minimum of 70% rounds per sieve and a minimum of 80% rounds overall.

### 960.3 CONSTRUCTION—

(a) **General.** For proper adhesion, perform surface preparation of the road surface and provide the pretreatment according to [Bulletin 15](#) or recommended by the manufacturer. Clean the roadway surface where the hot thermoplastic pavement markings will be applied. Remove all surface treatment, laitance, curing compound, or any contaminants that would hinder adhesion. Clear any loose dirt and other debris from the application area. Surface preparation is incidental to the application of hot thermoplastic pavement markings, except for the removal of pavement markings which is performed and paid for under [Section 963](#). Identify the location of the final pavement markings by applying spots on the pavement at 12 m (40-foot) intervals. The Inspector-in-Charge will approve the locations. Apply on dry pavement when the air and roadway temperatures are between 10 °C and 32 °C (50F and 90F) and when the wind speed is less than 32 km/h (20 miles per hour).

(b) **Application.** Uniformly apply the markings at a minimum thickness of 2.3 mm  $\pm$  0.08 mm (90 mils  $\pm$  3 mils). A tolerance of  $\pm$  6 mm ( $\pm$  1/4 inch) from the specified width will be allowed provided the variation is gradual and does not detract from the general appearance. For skip line patterns maintain a tolerance of  $\pm$  150 mm ( $\pm$  6 inches) for each 12 m (40-foot) cycle and  $\pm$  75 mm ( $\pm$  3 inches) for each 3 m (10-foot) skip line.

(c) **Glass Beads.** Apply glass beads immediately after application of the markings at a minimum rate of 4.5 kg/9 m<sup>2</sup> (10 pounds per 100 square feet) of markings. Uniformly distribute glass beads on the surface. Provide markings with an average minimum initial retroreflectivity of 300 mcd/m<sup>2</sup>/lux for white and 250 mcd/m<sup>2</sup>/lux for yellow. Under the direction and supervision of the Representative, measure retroreflectivity with a 30-meter geometry retroreflectometer, conforming to [ASTM E-1710](#) within 21 days after installation in accordance with [PTM No. 431](#).

(d) **Defective Markings.** Remove any markings placed incorrectly and replace them. Repair those markings, which after application and drying, are determined to be defective by the Inspector-in-Charge. Complete this work at no additional cost to the Department. Major problem areas and method of repair include the following:

- Insufficient thickness or line width, uneven cross-section—Prepare defective material by grinding or blast cleaning to remove a substantial amount of beads and the marking surface is roughened. Remove loose particles and debris with compressed air. Restripe the cleaned surface as specified in [Sections 960.3\(b\)](#) and (c).

- Inadequate retroreflectivity, glass bead coverage or retention—Remove defective markings and clean pavement surface, including 300 mm (1 foot) beyond each end of the affected area. Remove loose particles and debris with compressed air. Restripe the marking on the cleaned surface as specified in [Sections 960.3\(b\)](#) and (c).

**(e) Guarantee.** Where directed, remove and replace material that has not remained within close conformity to location or has not remained effective in performing useful service in accordance with [Section 107.16\(b\)](#) for a period of 180 days from the date of acceptance. The minimum acceptable service is as follows:

- **Longitudinal Markings.** 90% of material remains in each 305 m (1,000-foot) section of marking where the intersection unit is defined as material on an approach leg within 50 m (160 feet) of the intersection.
- **Transverse Markings, Legends, and Symbols.** 90% of material remains for each individual legend, symbol, crosswalk, or stop line.

#### 960.4 MEASUREMENT AND PAYMENT—

**(a) Line.** Meter (Linear Foot)

**(b) Legend.** Each