



**SPECIAL PROVISIONS  
FOR  
PERFORMED THERMOPLASTIC PAVEMENT MARKINGS**

**Pottawattamie County  
IMN-080-1(512)0--0E-78**

**Effective Date  
July 16, 2019**

**THE STANDARD SPECIFICATIONS, SERIES OF 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.**

**150533.01 DESCRIPTION.**

Under this work, the Contractor shall furnish and apply preformed thermoplastic pavement markings at the location and in accordance with patterns indicated on the plans or as ordered by the Engineer, and in conformance with the MUTCD and these specifications. This work may also include, when shown on the plans, grooves cut for lines and symbols and legends.

**150533.02 MATERIALS.**

**A. Preformed Thermoplastic.**

1. Preformed thermoplastic shall be capable of application on new and existing asphalt and Portland cement concrete surfaces.
2. Be stored in accordance with the manufacturer's instructions and manufacturer's requirements for shelf life and storage conditions. Be clearly labeled and in a dry and clean condition prior to use. Shipping documents and containers shall have identification numbers or batch dates for confirmation of when products were manufactured, brand name, name of manufacturer, lot or batch number, temperature range for storage, expiration date, the quantity contained and include material safety data sheets.
3. Provide an installed surface friction level of 45 BPN minimum.
4. Be colored yellow or white in conformance with the latest edition of the MUTCD as specified in plans. Route shield colors shall conform with the latest edition of the MUTCD as specified in plans.
5. Provide a surface bond to pavement throughout the installation meeting or exceeding 200 PSI per ASTM 4796.
6. Minimum thickness shall be 90 Mils.

**B. Primer.**

Primer, if specified, shall be recommended by the manufacturer.

**C. Glass Beads.**

Glass beads, if applied to the surface of pre-formed thermoplastic markings, shall comply, at a minimum, with the requirements of Section 4184 of the Standard Specifications.

**D. Approved Products.**

1. The following manufactures of preformed thermoplastic pavement markings may be utilized pursuant to meeting all other requirements of this specification:
  - Ozark Materials, LLC
  - Swarco Industires
  - Ennis Paint Co
  - Fortson-Peek Co., Inc
  - Geveko Markings Denmark A/S
  - Flint Trading (LFK, Inc)
2. Approval of preformed thermoplastic markings may be withdrawn because of deficient test results on samples; product changes made after the original qualification, or unsatisfactory field performance. Samples of the marking tape on which a qualification was based will be used as the standards for comparison with tapes supplied to projects.
3. The Office of Construction & Materials may sample and test marking tapes to verify compliance with specifications. Such samples will be a continuous 10 foot section.

**E. Acceptance.**

Acceptance of material shall be on the basis of final inspection per Article 150533.03, F and satisfactory field performance. Pavement markings shall be approved prior to installation on a project. Approval does not preclude the need for acceptance sampling and testing on a project-by-project basis.

**150533.03 CONSTRUCTION.**

**A. Contractor Qualifications.**

Provide a letter of certification from the preformed thermoplastic pavement marking manufacturer indicating the Contractor's qualifications to install their product.

**B. Equipment.**

All equipment shall be of such design and maintained in such condition as to properly heat, mix, and apply the material.

**C. Surface Preparation.**

1. Grooving for pavement markings shall be 110 mils +/- 10 mils.
2. The pavement surface on which the thermoplastic material is to be placed shall be clean and dry. Even if the pavement is visibly dry, subsurface moisture may be present in amounts sufficient to affect bonding. To test for dryness, a 3 to 6 foot section of tar paper shall be laid on the pavement and molten thermoplastic applied on top. After 30 seconds, lift the paper and check for moisture on the bottom of the paper. If the paper is dripping wet, wait until the pavement has dried before applying the thermoplastic. If the paper shows only a damp spot, proceed with the thermoplastic application.
3. Pavement surfaces shall be inspected for cleanliness and any dirt, debris, or other contaminants on the surface to be marked shall be removed.

**D. Application.**

**1. Asphalt.**

The material shall be applied as recommended by the manufacturer. The material must be able to be applied without preheating of the pavement. A primer may be required pursuant to manufacturers installation requirements.

**2. Portland Cement Concrete.**

The same application procedure shall be used as described in Article 150533.03, D, 1. However, a primer shall be applied and cured in accordance with the recommendations of the manufacturer of the thermoplastic material.

**3. Temperature Limitations.**

The pavement surface where the thermoplastic is to be placed shall have a minimum temperature of 50°F. The air temperature shall be at least 50°F during marking operations. The pavement surface temperature and air temperature shall be determined before the start of each day of marking operation and at any other time deemed necessary by the Engineer.

**4. Glass Beads.**

Glass beads shall be applied as recommended by the manufacturers of the thermoplastic material.

**E. General Requirements.**

The applied thermoplastic markings will be inspected continually for overall workmanship. Markings shall have clean cut edges and the color shall be distinctive. The glass beads shall appear uniform on the entire marking surface.

**F. Final Inspection.**

1. Provide an acceptable 100-foot retro-reflectometer to use on the project which will remain the property of the Contractor. In the presence of the Engineer, measure the retro-reflectivity of all preformed thermoplastic markings. Take a minimum of five randomly spaced readings per color line every 1 mile (or one randomly selected reading per ten symbols). The minimum retro-reflectivity shall be

<u>Minimum Coefficient of Retroreflected Luminance (mcd / sq. ft. / ft.-cdl.)</u>	
White lines	400
Yellow lines	250

2. If the marking does not meet these initial retro-reflectivity readings, if the marking does not have the required minimum thickness, or if the marking does not comply with the specifications for any other reason, the Engineer may require complete removal or correction at the Contractor's expense.

**150533.04 METHOD OF MEASUREMENT.**

Measurement for pavement markings, symbols and legends, satisfactorily placed or removed, will be as follows:

**A. Preformed Thermoplastic Pavement Markings.**

The number of stations of markings placed will be calculated by the Engineer, using the beginning and ending points for each type of line placed, based on a single 4 inch width as outlined in plans. The types are as shown in the plans. The calculations for broken or dotted lines are adjusted in the table to exclude skips as specified. The calculation for solid lines will be adjusted to exclude breaks. The quantities for several types of lines will be totaled to a single quantity of thermoplastic longitudinal 4 inch lines in stations.

**B. Preformed Thermoplastic Symbols and Legends.**

Each precut symbol or legend is indicated on the plans, and the units will be counted. Each of the following is a complete unit: each STOP; each SCHOOL legend (one lane or two lane); each R x R marking for railroad and highway grade crossing; each ONLY; each AHEAD; each freeway, expressway, and ramp arrow; each straight, curve, or combined arrow; each route shield.

**150533.05 BASIS OF PAYMENT.**

**A.** Payment for pavement markings, symbols and legends, satisfactorily placed or removed, will be at the contract unit price as follows:

**1. Preformed Thermoplastic Pavement Markings.**

For the number of stations of thermoplastic longitudinal lines and transverse markings placed, the Contractor will be paid the contract price per station.

**2. Preformed Thermoplastic Symbols and Legends.**

For each unit of precut symbol and legend placed, the Contractor will be paid the contract price.

**B.** This compensation will be full payment for all work involved in cleaning and preparing the surface and furnishing, applying, and maintaining the pavement marking, and for furnishing all equipment, tools, and labor necessary to complete the work. Removal of existing markings is included as a bid item in the plans and paid for at the contract unit price. The accepted quantity of thermoplastic pavement marking will be paid for at the contract unit price.