

## **Preformed Thermoplastic ReflectORIZED Pavement Letters & Symbols**

**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.

### **MATERIALS.**

**Preformed Thermoplastic.** Preformed thermoplastic shall be capable of application on new and existing asphalt and Portland cement concrete surfaces, meet the requirements of AASHTO M249 and shall:

- Not contain 0.1% or more of any chemical listed by the International Agency for Research on Cancer (IARC), the National Toxicology Program (NTP), or regulated by the US Occupational Safety and Health Administration (OSHA) as a carcinogen.
- Conform to current Federal, State and Local air pollution regulations, including those for the control (emission) of volatile organic compounds (VOC).
- Be packaged in suitable, well-sealed in their original unopened containers. 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. This information shall be made available for inspection at any time.
- Be stored in accordance with the manufacturer's instructions and manufacturers' requirements for shelf life and storage conditions.
- Be clearly labeled and in a dry and clean condition prior to use.
- Provide an installed surface friction level of 45 BPN minimum
- Be colored white in conformance with the latest edition of the Manual of Uniform Traffic Control Devices (MUTCD) as specified on provided Work Orders or Plans.
- Provide a surface bond to pavement throughout the installation meeting or exceeding 200 PSI per ASTM 4796

**Glass Beads.** Only preformed thermoplastic containing white retro reflective glass beads intermixed throughout shall be used. Glass beads are additionally applied during installation when the surface is liquefied to the surface of the marking. Glass beads applied to the surface of pre-formed thermoplastic pavement markings shall meet the requirements of NYSDOT Standard Specifications Section 727-05.

**APPROVED PREFORMED THERMOPLASTIC MATERIALS.** Products appearing on the list below with a Manufacturer's certification that the product meets the requirements of this specification, or a Product approved equal as determined by the Engineer, are deemed acceptable for use:

PreMark® by Ennis-Flint  
115 Todd Court, Thomasville, NC 27360  
336-475-6600 [www.ennisflint.com](http://www.ennisflint.com)

Swarco Industries Inc.  
P.O. Box 89, Columbia, TN 38402  
800-216-8781 [www.swarco.com](http://www.swarco.com)

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Ozark Materials, LLC  
591 Glendale Av, Greenville, AL 36037  
334-213-2995 [www.ozarkmaterials.net](http://www.ozarkmaterials.net)

Crown Technology, LLC  
35 Industrial Park Drive  
Woodbury, GA 30293  
706-553-7500 [www.crownthermo.com](http://www.crownthermo.com)

### **CONSTRUCTION DETAILS.**

**General.** All pavement markings and patterns shall be placed as shown on the Contract or Work Order documents and in accordance with the MUTCD.

Before any pavement marking work is begun, a schedule of operations shall be submitted for approval by the Engineer or his/her authorized representative. At least five (5) days prior to starting striping, the Contractor shall provide the Engineer with the preformed thermoplastic manufacturer's written instructions for use. These instructions shall include, but not be limited to, material mixing ratios and application temperatures.

When pavement markings are applied under traffic, the Contractor shall provide all necessary flags, markers, signs, etc. in accordance with the MUTCD to maintain and protect traffic, and to protect marking operations and the markings until thoroughly set.

The application of pavement markings shall be done in the general direction of traffic. Installation against the direction of traffic flow shall not be allowed.

The Contractor shall be responsible for removing, to the satisfaction of the Engineer, all tracking marks, spilled preformed thermoplastic, and preformed thermoplastic markings applied in unauthorized areas.

**Atmospheric Conditions.** Preformed thermoplastic pavement markings shall only be applied during conditions of dry weather and on substantially dry pavement surfaces. At the time of installation the pavement surface temperature shall be at or above manufacturer recommendations.

**Surface Preparation.** The Contractor shall clean the pavement and existing durable markings to the satisfaction of the Engineer. At the time of application, all pavement surfaces and existing durable markings shall be free of oil, dirt, dust, grease and similar foreign materials. A high volume air blower shall be used to clear dust and debris from the surface for all applications to be included in the unit cost for this item - except where water blasting for surface preparation is specifically called out on the Work Order as a payment item.

**Preformed Thermoplastic Application Equipment.** A heat torch for placement of markings and/or drying of pavement shall be the type recommended by the manufacturer of the preformed material. All application equipment shall be approved by the Engineer prior to the start of work.

**Application of Preformed thermoplastic Reflectorized Pavement Markings.** Preformed thermoplastic reflectorized pavement markings shall be placed at the width and pattern designated by the Contract Documents. Marking operations shall not begin until applicable surface preparation work is completed and approved by the Engineer, and the atmospheric conditions and pavement surface temperature are acceptable to the Engineer. If required by manufacturer, a heat torch shall be used to remove moisture and/or heat pavement surface to temperature indicated by manufacturer.

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**Thermoplastic Primer.** All Portland cement pavement surfaces shall be primed. The primer shall be either a one-component or a two-component, cold or hot applied material of the type recommended by the manufacturer of the thermoplastic pavement marking material. At least five working days prior to the start of thermoplastic application, the Contractor shall provide the Engineer with the manufacturer's written instructions for primer application. The application of the primer shall be performed in accordance with the manufacturer's written recommendations which shall include the method of application, the application rate, and the drying time.

**Defective Preformed Thermoplastic Pavement Markings.** Preformed thermoplastic reflectorized pavement markings, which after application and setting are determined by the Engineer to be defective and not in conformance with this specification, shall be repaired. Repair of defective markings shall be the responsibility of the Contractor and shall be performed to the satisfaction of the Engineer as follows:

1. Insufficient glass bead coverage or inadequate glass bead retention.  
Repair Method. Prepare the surface of the defective preformed thermoplastic marking or the surface so the application surface shall be free of oil, dirt, dust, grease and similar foreign materials . Repair shall be made by removing and replacing the marking or by melting the surface and evenly reapplying glass beads with a shaker.
2. Uncured or discolored thermoplastic and/or insufficient bond (to pavement surface or existing durable marking).  
Repair Method. The defective preformed thermoplastic marking shall be completely removed and cleaned to the underlying pavement surface and re-applied in accordance with the requirements of this specification.

Other defects not noted above, but determined by the Engineer to need repair, shall be repaired or replaced as directed by and to the satisfaction of the Engineer.

All work in conjunction with the repair or replacement of defective preformed thermoplastic reflectorized pavement markings shall be performed at the Contractor's expense.

**Personal Protective Equipment.** Follow all exposure, respiratory and personal protective equipment controls, handling and safety precautions and spill and disposal procedures as identified by s safety data sheets (SDS), labels and other manufacturer's recommendations for the products used.

**WORK ZONE TRAFFIC CONTROL (WZTC).** The Contractor is responsible for ensuring appropriate WZTC in compliance with the MUTCD appropriate for the dry time of the selected material applied. The Contractor is responsible to ensure adequate WZTC to prevent those walking, skating, bicycling, and driving from coming into contact with applied material that is still capable of being tracked. The Contractor shall be liable for such tracking and property damage should it occur.

**METHOD OF MEASUREMENT.** Payment for preformed letters and symbols will be based on a unit price, which is defined in the contract and the **Payment Factor Table** included in this specification.

**BASIS OF PAYMENT.** The accepted quantities of markings will be paid for at the contract unit price, which shall include the cost of furnishing all labor, materials and equipment to satisfactorily complete the work. The cost for maintaining and protecting traffic during the marking operations shall be included in the price bid. The cost of removal of concrete curing compounds and existing pavement markings will be paid under separate items and are not included in this item.















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***Payment will be made under:***

<b>Item</b>	<b>Pay Unit</b>
Preformed Thermoplastic Reflectorized Pavement Letters & Symbols	Unit*

\*See following page for table to be used in determining payment factor for preformed thermoplastic letters and symbols

**Payment Factors for Installation of  
Preformed Thermoplastic Pavement Markings**

Type	Item	Preformed Units	
Symbols		Turn Arrow	1.00
		Through (straight) Arrow	0.86
		Combo Arrow	1.81
		Combo Arrow (left/right)	1.88
		Lane Reduction Arrow	2.58
		Bicycle Facility Arrow	0.38
		Wrong Way Arrow	1.01
		HOV Lane	0.47
		Sharks Teeth 12" x 18"	0.06
		Sharks Teeth 24" x 36"	0.12
		Speed Hump Marking	0.45
		Bike Symbol 40" x 72"	0.91
		Bike Symbol 24" x 48"	0.60
		Ped Symbol 72"	0.84
8' Letters & Numbers	A	0.41	
	B	0.41	
	C	0.41	
	D	0.41	
	E	0.41	
	F	0.41	
	G	0.41	
	H	0.41	
	I	0.41	
	J	0.41	
	K	0.41	
	L	0.41	
	M	0.41	
	N	0.41	
	O	0.41	
	P	0.41	
	Q	0.41	
	R	0.41	
	S	0.41	
	T	0.41	
	U	0.41	
V	0.41		
W	0.41		
X	0.41		
Y	0.41		
Z	0.41		
1	0.41		
2	0.41		
3	0.41		
4	0.41		
5	0.41		
6	0.41		
7	0.41		
8	0.41		
9	0.41		
0	0.41		
	10' School	N.A.	

**Notes**

- Letters and symbols shown to the left will be paid in accordance to the number of "Units" they represent.
- For preformed thermoplastic, "1 Unit" is based on average list price from four leading preformed thermoplastic pavement marking manufacturers for the same turn arrow symbol.
- N.A. = Not Applicable because this option is not used by NYCDOT.
- Symbols / letters / numbers not shown may be added to the contract using the same methodology presented above for payment.
- See NYCDOT Typical Drawings in Exhibit A of this contract for typically utilized symbols and letter configurations.
- The factors listed in this table are fixed for the duration of the contract unless modified by change order.