

**PROJECT SPECIAL PROVISION  
POLYUREA PAVEMENT MARKING MATERIAL  
HIGHLY RETROREFLECTIVE ELEMENTS**

**Section 1205-1 DESCRIPTION:**

This special provision covers machine applied “Highly Retroreflective” Polyurea pavement marking material with reflective elements. All remaining Articles in Section 1205 shall be as described in the 2002 Standard Specification for Roads and Structures with the exceptions below.

**Section 1205-2 Materials**

**(A) General**

Replace Article (A) with the following:

Use Section 1087-Articles 1, 3, 5 & 6 (General, Color, Packaging for Shipment, and Storage Life) as described in the 2002 Standard Specifications for Roads and Structures. The manufacturer may recommend any remaining information necessary for the placement of “Highly Retroreflective” Polyurea pavement markings.

**(B) Material Qualification**

Replace Article (B) with the following:

Use only “Highly Retroreflective” polyurea pavement markings that have been pre-approved by the Traffic Control Unit prior to application. Use retroreflecting elements according to the manufacturer’s recommendations in order to meet the retroreflectivity requirements as stated in Section 1205-3(G)(8) as measured by a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

Furnish a Type 3 Material Certification and Type 4 Material Certification in accordance with Article 106-3 as described in the 2002 Standard Specifications for Roads and Structures.

For more information, contact the Traffic Control Unit at 919 250-4151.

**Section 1205-3 Construction Methods**

Section 1205-3(B) (1) General for all Application Equipment: Add the following sentence after the last paragraph:

Do not use handliners or any other non-truck mounted pavement marking machine to install “Highly Retroreflective” polyurea pavement markings on long-line applications.

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Updated 12/30/02  
Revised:

Add the following Section immediately following Section 1205-3(G)(8)

**Section 1205-3 (G) (9) “Highly Retroreflective” Polyurea Application:**

Produce “Highly Retroreflective” Polyurea pavement marking lines which have a minimum dry thickness of 20 mils (0.50mm) when placed on concrete and asphalt pavements.

Using the Polyurea application equipment, apply the pavement marking materials simultaneously. Apply the Polyurea resin, mixed at the proper ratio according to the manufacturer recommendations, to the pavement surfaces within the proper application temperatures as determined by the material manufacturer. Inject reflective elements into the molten (liquid) Polyurea pavement markings.

Apply reflective elements according to manufacturer’s recommendation to immediately produce a highly reflective marking.. At the time of installation, provide in-place marking with the minimum reflectance values shown below, as obtained with a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer. Maintain the retroreflectance values shown below for a minimum of 30 days from the time of placement of marking material.

**WHITE: 800 mcd/lux/m2**  
**YELLOW: 500 mcd/lux/m2**

Produce marking, which upon cooling, is uniformly reflectorized and has the ability to resist deformation caused by traffic throughout its entire length.

The manufacturer of the Polyurea pavement marking material shall certify the Contractor to place the material. Provide at least one member of each crew that completed this training. Furnish the Engineer written confirmation of this training from the material manufacturer prior to the beginning of work. The manufacturer’s technical representative shall be onsite during the entire installation of product.

Provide a manufacturer’s technical representative that is knowledgeable and familiar with the Contractors application equipment prior to the installation of the Polyurea pavement markings.

**Section 1205-3(H)(1) Observation Period for “Highly Retroreflective” Polyurea Pavement Markings:**

Replace the first paragraph with the following:

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Thermoplastic, epoxy, and polyurea pavement markings are subject to a 180 day observation period.

Add the following just before the last paragraph:

**Provide high visibility polyurea pavement marking materials that maintain minimum retroreflectance values throughout the observation period as follows:**

**WHITE: 700 mcd/lux/m2**  
**YELLOW: 400 mcd/lux/m2**

**In addition to the 180 day observation period, provide high visibility polyurea pavement marking materials that meet the following minimum retroreflectance values after having been snowplowed:**

**WHITE: 375 mcd/lux/m2**  
**YELLOW: 250 mcd/lux/m2**

These measurements will be taken within 30 days prior to the end of the Observation Period. The reflectance values will be taken using a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

**Section 1205-3(I) Removal of Pavement Markings:**

Add the following just before the last paragraph:

Do not apply Polyurea pavement marking over existing pavement marking materials having less adherence than the Polyurea. Remove existing lines according to the manufacturer's recommendations.

**Measurement and Payment:**

Measurement and payment shall be in accordance with Section 1205 of the North Carolina Standard Specifications for Roads and Structures.

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Updated 12/30/02  
Revised:

PROJECT SPECIAL PROVISIONS  
POLYUREA PAVEMENT MARKING MATERIAL WITH  
STANDARD GLASS BEADS

**Section 1205-1 DESCRIPTION:**

This special provision covers machine applied Polyurea pavement marking material with both incorporated glass beads and drop-on glass beads. All remaining Articles in Section 1205 shall be as described in the 2002 Standard Specification for Roads and Structures with the exceptions below.

**Section 1205-2 Materials**

**(A) General**

Replace Article (A) with the following:

Section 1087-Articles 1, 3, 5 & 6 (General, Color, Packaging for Shipment, and Storage Life) shall be as described in the 2002 Standard Specifications for Roads and Structures. The manufacturer may recommend any remaining information necessary for the placement of Polyurea pavement markings.

**(B) Material Qualification**

Replace Article (B) with the following:

Use only Polyurea pavement markings that have been pre-approved by the Traffic Control Unit prior to application. Use both incorporated glass beads and drop-on glass beads according to the manufacturer's recommendations in order to meet the retroreflectivity requirements as stated in Section 1205-3(G)(8) as measured by a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

Furnish a Type 3 Material Certification and Type 4 Material Certification in accordance with Article 106-3 as described in the 2002 Standard Specifications for Roads and Structures.

For more information, contact the Traffic Control Unit at 919 250-4151.

**Section 1205-3 Construction Methods**

Section 1205-3(B) (1) General for all Application Equipment: Add the following sentence after the last paragraph:

Do not use handliners or any other non-truck mounted pavement marking machine to install Polyurea pavement markings on long-line applications.

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Updated 12/30/02  
Revised:

Add the following Section immediately following Section 1205-3(G)(8)

**Section 1205-3 (G) (9) Polyurea Application:**

Produce Polyurea pavement marking lines that have a minimum dry thickness of 20 mils (0.50mm) when placed on concrete and asphalt pavements.

Using the Polyurea application equipment, apply the pavement materials simultaneously. Apply the Polyurea resin, mixed at the proper ratio according to the manufacturer's recommendations, to the pavement surfaces within the proper application temperatures as determined by the material manufacturer. Inject reflective glass beads into the molten (liquid) Polyurea pavement markings.

Apply glass beads according to manufacturer's recommendations. At the time of installation, provide in-place marking with the minimum reflectance values shown below, as obtained with a LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer. Maintain the retroreflectance values shown below for a minimum of 30 days from the time of placement of marking material.

**WHITE: 375 mcd/lux/m<sup>2</sup>**

**YELLOW: 250 mcd/lux/m<sup>2</sup>**

Produce marking, which upon cooling, is uniformly reflectorized and has the ability to resist deformation caused by traffic throughout its entire length.

The manufacturer of the Polyurea pavement marking material shall certify the Contractor to place the material. Provide at least one member of each crew that completed this training. Furnish the Engineer written confirmation of the training from the material manufacturer prior to the beginning of work. The manufacturer's technical representative shall be onsite during the entire installation of product.

Provide a manufacturer's technical representative that is knowledgeable and familiar with the Contractor's application equipment prior to the installation of the Polyurea pavement markings.

**Section 1205-3(H)(1) Observation Period for Polyurea Pavement Markings:**

Replace the first paragraph with the following:

Thermoplastic, epoxy, and polyurea pavement markings are subject to a 180 day observation period.

Add the following just before the last paragraph:

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Revised:

**Provide polyurea pavement marking materials that maintain minimum retroreflectance values throughout the 180 day observation period as follows:**

**WHITE: 325 mcd/lux/m<sup>2</sup>**  
**YELLOW: 200 mcd/lux/m<sup>2</sup>**

These measurements will be taken by the Department within 30 days prior to the end of the Observation Period. The reflectance values shall be taken with an LTL 2000, LTL-X or Department approved 30m mobile retroreflectometer.

**Section 1205-3(I) Removal of Pavement Markings:**

Add the following just before the last paragraph:

Do not apply Polyurea pavement marking over existing pavement marking materials having less adherence than Polyurea. Remove existing lines according to the manufacturer's recommendations.

**Measurement and Payment:**

Measurement and payment shall be in accordance with Section 1205 of the North Carolina Standard Specifications for Roads and Structures.

T.I.P. #: R-0513A  
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Revised:

**WORK ZONE SIGNS – FLUORESCENT ORANGE TYPES VII, VIII OR IX 09-21-04**

**DESCRIPTION.**

**Page 11-5, Article 1110-1 DESCRIPTION.**

**Delete Article 1110-1 and substitute the following:**

Furnish, install, maintain, temporarily cover and uncover, relocate and remove work zone signs (stationary, portable, barricade mounted and detour) as shown in the Traffic Control Plans, the contract documents and *2002 Standard Specifications*.

**MATERIALS.**

**Page 11-5, Sub-Article 1110-2 Part (A) General:**

**Delete Sub-Article 1110-2 Part (A) and substitute the following:**

**(A) General:**

Refer to Division 10:

Work Zone Sign Supports.....Article 1089-2  
Barricades.....Article 1089-3

**Work Zone Signs**

Sign retroreflective sheeting requirements for Types I through IX are described in *Section 1093 Retroreflective Sheeting* of the *2002 Standard Specifications*. Cover the entire sign face with reflective sheeting. Apply the reflective sheeting in a workmanlike manner so there are no bubbles or wrinkles in the material.

**1. Work Zone Signs (Stationary):**

Use Types VII, VIII or IX fluorescent orange retroreflective sheeting. Construct sign backing of a rigid material such as aluminum or approved rigid composite material. Signs and sign supports shall meet NCHRP 350 requirements for Breakaway Devices.

**2. Work Zone Signs (Barricade Mounted):**

Use Types VII, VIII or IX fluorescent orange retroreflective sheeting. Signs and barricade assembly shall meet the requirements of NCHRP 350 for Work Zone Category II Devices and be on the NCDOT Approved Products list. Black on White Barricade Mounted Signs shall conform to the requirements of *Section 900 General Requirements for Signing* of the *2002 Standard Specifications*.

**3. Work Zone Signs (Portable):**

Use fluorescent orange retroreflective sheeting without adhesive backing with equal retroreflective properties as Type VII, VIII or IX sheeting for roll-up portable work zone signs. Construct roll-up portable work zone sign backing with 3/16" x 1 1/4" horizontal rib and 3/8" x 1 1/4" vertical rib.

Use Types VII, VIII or IX fluorescent orange retroreflective sheeting for rigid portable work zone signs. Construct rigid portable work zone sign backing with an approved composite material.

Use portable work zone signs only with portable work zone sign stands specifically designed for one another. Signs and sign supports shall meet NCHRP 350 requirements for Work Zone Category II Devices and be on the NCDOT Approved Products list.

**4. Work Zone Signs (Detour):**

Use Types VII, VIII or IX fluorescent orange sheeting. Signs and supports shall meet the requirements of NCHRP 350 for Work Zone Category II Devices.

**(B) Material Qualifications:**

Materials shall conform to the requirements of *Article 1093 and Sub-Articles 1089-1 (B), 1089-1 (C) and 1110-2 (B)* of the *2002 Standard Specifications* and the following.

**Page 11-6, Sub-Article 1110-2 Part (B):**

Change references in sub-article from "Traffic Control Section" to "Traffic Control Unit".

**Page 11-6, Sub-Article 1110-2 Part (B):**

Append the second paragraph in this sub-article with the following 2 sentences.

A three-year warranty is required for all new roll-up signs for discoloration and retroreflectivity. Signs must maintain eighty percent (80%) of its retroreflectivity for first two (2) years and fifty percent (50%) for third year.

**(C) Historical Performance:**

Materials shall conform to the requirements of *Sub-Article 1110-2 (C)* of the *2002 Standard Specifications*.

**CONSTRUCTION METHODS.**

Work zone signs with fluorescent orange Types VII, VIII or IX shall conform to the requirements of *Article 1110-3 Construction Methods* of the *2002 Standard Specifications*.

**MAINTENANCE.**

Maintain work zone signs with fluorescent orange Types VII, VIII or IX (stationary, portable and barricade mounted) in accordance with the provisions of *Article 1110-04 Maintenance* of the *2002 Standard Specifications*.

**MEASUREMENT AND PAYMENT.**

Measurement and payment for work zone signs with fluorescent orange Types VII, VIII or IX (stationary, portable, barricade mounted and detour) will be made in accordance with the provisions of *Articles 1110-4 Method of Measurement and 1110-5 Basis of Payment* of the *2002 Standard Specifications* and the following.

Payment will be made under:

<b>PAY ITEM</b>	<b>PAY UNIT</b>
Work Zone Signs – Fluorescent Orange Types VII, VIII or IX (Stationary)	Square Foot (Square Meter)
Work Zone Signs – Fluorescent Orange Types VII, VIII or IX (Portable)	Square Foot (Square Meter)
Work Zone Signs – Fluorescent Orange Types VII, VIII or IX (Barricade Mounted)	Square Foot (Square Meter)

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