

STATE OF NEBRASKA
DEPARTMENT OF ROADS
ADDENDUM NO. 1
AND
ELECTRONIC BIDDING SYSTEM
AMENDMENT NO. 1
PROJECT NO. RD-80-6(1033)
CONTROL NO. 42556
CALL ORDER 410
I-80, SHELTON – WOOD RIVER
LETTING DATE: MAY 22, 2008

The Schedule of Items for Group 9 is amended as follows:

1. The quantity for the bid item "Barricade, Type II" is incorrect and should read 1,750.000 BDAY.
2. The quantity for the bid item "Barricade, Type III" is incorrect and should read 255.000 BDAY.
3. The quantity for the bid item "Temporary Sign Day" is incorrect and should read 420.000 EACH.
4. The quantity for the bid item "Sign Day" is incorrect and should read 1,320.000 EACH.
5. The quantity for the bid item "Remove Plowable Pavement Marker" is incorrect and should read 616.000 EACH.
6. The quantity for the bid item "Flashing Arrow Panel" is incorrect and should read 35.000 DAY.
7. The bid item "5" Yellow Thermoplastic" has been eliminated.
8. The bid item "5" White Thermoplastic" has been eliminated.
9. The bid item "12" White Thermoplastic" has been eliminated.
10. The bid item "Overlay Broken Lines" has been added with a quantity of 936.000 STA.
11. The bid item "Overlay Solid Lines" has been added with a quantity of 1,872.000 STA.
12. The bid item "5" Yellow Polyurea Pavement Marking, Grooved" has been added with a quantity of 114,900.000 LF.
13. The bid item "5" White Polyurea Pavement Marking, Grooved" has been added with a quantity of 94,410.000 LF.

14. The bid item "12" White Polyurea Pavement Marking, Grooved" has been added with a quantity of 640.000 LF.

The EBS generated bid items sheets must show this correction or the bid will be considered void.

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Page 1 of the Proposal has been changed as follows:

1. The TENTATIVE START DATE is amended to read 08/04/08.
2. The CONTRACT TIME is amended to read 35 WORKING DAYS.

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On page 14 of the Special Provisions, the provision titled **REMOVE PLOWABLE PAVEMENT MARKERS** is void and superseded by the following:

REMOVE PLOWABLE PAVEMENT MARKERS

This work involves the removing of plowable pavement markers as shown in the plans, and/or as required by the Engineer.

The work of removing the plowable pavement markers shall include removing the existing casting, cleaning the cut (left by the removal of the casting) of debris, and sealing the cut with an epoxy flush to the surface of the concrete pavement. This work shall occur prior to the subsequent diamond grinding operation.

A Grade 3 Epoxy Adhesive shall be from the approved products list and shall be used in accordance with Section 1018 of the Standard Specifications.

Subsection 419.05 in the 2007 Standard Specifications is amended to include the item: "Remove Plowable Pavement Markers". This price shall be full compensation for removing and filling cuts, and for all labor, equipment, tools, materials and incidentals required to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
Remove Plowable Pavement Markers	Each

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On page 15 of the Special Provisions, in the provision titled **COLD MILLING CLASS I**, the last three paragraphs are void.

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The Special Provisions are amended to include the following:

Polyurea Pavement Marking, Grooved

I. Description

This work shall consist of furnishing and installing retroreflective polyurea pavement markings in accordance with this provision and in conformance to the dimensions and lines shown on the plans or established by the engineer.

The polyurea marking material shall be applied by spray method onto asphaltic cement concrete and Portland cement concrete surfaces. Following an application of glass beads, and upon curing, the resulting marking shall be an adherent reflectorized stripe of the specified thickness and width that is capable of resisting deformation by traffic.

The contractor shall field verify the pavement marking quantities required for the project prior to purchasing materials. The Department will not be held responsible for the contractor's shortage or surplus of material. The contractor's verification of quantities and purchasing material shall not delay the project or the installation of pavement marking when required.

The polyurea pavement marking shall be applied in grooves cut into the surfacing. The grooves shall be made in a single pass dry cut using stacked diamond cutting heads; the equipment used shall be self vacuuming and leave the cut groove ready for polyurea pavement marking application. The equipment and method used shall be approved by the polyurea pavement marking manufacturer. The bottom of the groove shall have a fine corduroy finish. If a course, tooth pattern is present, increase the number of blades and decrease the spacers on the cutting head. The polyurea pavement marking shall be applied in the grooves the same day as the cut. Grooves shall be clean and dry prior to polyurea pavement marking application. All conflicting pavement markings remaining after polyurea pavement marking application shall be removed; this removal shall be subsidiary to the pavement marking.

Groove width: polyurea pavement marking width + 1 inch +/- 1/8 inch
Groove depth: Per Manufacturers recommendations
Groove length: full length of marking + required grooving transition
Groove position: 2 inches left of joint line

Grooving of the surfacing shall be performed in accordance with the polyurea manufacturer's recommendations. Grooving the surfacing shall not be measured and paid for but shall be considered subsidiary to "Polyurea Pavement Marking, Grooved".

II. **Materials**

A. Polyurea

Composition Requirements:

Composition requirements are per manufacturers specifications. The Polyurea Pavement Markings approved for use are shown in the NDR Approved Products List. Markings which have not been previously approved by the Department will not be permitted on the project until approved by the Traffic Engineer.

Properties:

1. Color: The preformed markings shall consist of white and yellow films with pigments selected and blended to conform to standard highway colors.
2. Color and Weathering Resistance: The mixed polyurea compound, both white and yellow, when applied to a 3" x 6" aluminum panels at 15 ± 1 mil in thickness with no glass beads or elements and exposed for 500 hours in a Q.U.V. Environmental Testing Chamber, as described in ASTM-G154, Cycle #1, shall conform to the following minimum requirements. The color of the white polyurea system shall not be darker than Federal Standard No. 595A-17778. The color of the yellow polyurea system shall conform to Federal Standard No. 595A-13538.
3. Track-Free Time (Laboratory): When tested in accordance with ASTM D 711, the polyurea marking material shall reach a track-free condition in 5 minutes or less for a 15 mil thickness. This test shall be performed with AASHTO Type 1 beads coated at a rate of 0.099 pounds per square foot. The track-free time shall not increase substantially with decreasing temperature.
4. Adhesion to Concrete: The polyurea coating, when tested according to ACI Method 503, shall have such a high degree of adhesion to the specified concrete surface that there shall be a 100% concrete failure in the performance of this test. The prepared specimens shall be conditioned at room temperature ($75^{\circ} \pm 2^{\circ}$ F) for a minimum of 24 hours and maximum of 72 hours prior to the performance of the tests indicated.
5. Adhesion to Asphalt: The polyurea coating, when tested according to ACI Method 503, shall have such a high degree of adhesion to the specified asphalt surface that there shall be a 100% asphalt failure in the performance of this test. The prepared specimens shall be conditioned at room temperature ($75^{\circ} \pm 2^{\circ}$ F) for a minimum of 24 hours and maximum of 72 hours prior to the performance of the tests indicated.

B. Reflective Media

The reflective media shall be made up of glass beads for drop-on application and shall conform to the following requirements *or be an approved equivalent*.

1. Glass Beads

The required glass beads shall be a 60/40 blend (60% sinkers and 40% floaters) of AASHTO M 247-81 Type I gradation 1.5 index glass beads. The glass beads shall have a minimum of 70% Rounds as measured according to ASTM D1155. Crush Resistance shall be measured according to the procedures of ASTM D1213 and shall be a minimum

of 30 pounds retained on US #40 Mesh.

Acid Resistance: A sample of glass beads supplied by the manufacturer shall show resistance to corrosion of their surface after exposure to a 1% solution (by weight) of sulfuric acid. The 1% acid solution shall be made by adding 5.7cc of concentrated acid into 1000cc of distilled water. CAUTION: Always add the concentrated acid into the water, not the reverse. The test shall be performed as follows:

Take a 1" x 2" sample, adhere it to the bottom of a glass tray and place just enough acid solution to completely immerse the sample. Cover the tray with a piece of glass to prevent evaporation and allow the sample to be exposed for 24 hours under these conditions. Then decant the acid solution (do not rinse, touch, or otherwise disturb the bead surfaces) and dry the sample while adhered to the glass tray in a 150° F (66° C) oven for approximately 15 minutes. Microscopic examination (20X) shall show not more than 15% of the beads having a formation of very distinct opaque white (corroded) layer on their entire surface.

C. Finished Markings

Because of normal variances in road surfaces, application processes, and measurement, the properties of markings made from the materials specified herein will vary from one installation to the next. When the materials are applied according to the specifications in Section III, they shall be capable of forming markings with the following reproducibility of properties:

1. On-the-road Track-Free Time: When installed at 77° F and at a wet film thickness of 15±1 mils, the markings shall reach a no-track condition in less than 3 minutes. Track-free shall be considered as the condition where no visual deposition of the polyurea marking to the pavement surface is observed when viewed from a distance of 50 feet, after a free-rolling traveling vehicle's tires have passed over the line. The track-free time shall not increase substantially with decreasing temperature.
2. Skid Resistance: The average initial skid resistance shall be 45 BPN or greater when tested according to ASTM E303.
3. Reflectance: The initial retroreflectance averaged over many installations shall be at least 900 [(mcd(ft⁻²)(fc⁻¹)] for white and 700 [(mcd(ft⁻²)(fc⁻¹)] for yellow. The standard deviation of initial retroreflectance for many installations shall be no more than 130 [(mcd(ft⁻²)(fc⁻¹)] for both white and yellow.

The initial retroreflectance of a single installation shall be the average value determined according to the measurement and sampling procedures outlined in ASTM D 6359, using a 30-meter retroreflectometer. The 30-meter retroreflectometer shall measure the coefficient of retroreflected luminance, R_L , at an observation angle of 1.05 degrees and an entrance angle of 88.76 degrees. R_L shall be expressed in units of millicandelas per square foot per foot-candle [(mcd(ft⁻²)(fc⁻¹)]. The metric equivalent shall be expressed in units of millicandelas per square meter per lux [mcd(m⁻²)(lux⁻¹)].

Initial performance of pavement markings shall be measured within 14 days after application. The Traffic Engineer shall be notified prior to the placement of pavement markings.

II. Application

The Contractor shall furnish equipment and apply the materials according to the following specifications:

A. Equipment

Application equipment shall be capable of producing markings that meet the specifications of the manufacturers listed in the NDR Approved Product List for Polyurea Pavement Marking.

At any time throughout the duration of the project, the Contractor shall provide free access to his application equipment for inspection by the Engineer, his authorized representative, or a materials representative.

B. Application Conditions:

1. **Moisture:** The markings shall only be applied during conditions of dry weather and when the pavement surface is dry and free of moisture.
2. **Air Temperature:** The markings shall only be applied when road and air temperatures are above 40 degrees F.
3. **Surface Preparation:** Marking operations shall not begin until applicable surface preparation work is completed and approved by the Engineer.
 - 3.1 Prior to applying the markings, the contractor shall remove any remaining existing markings to expose a minimum of 80% of the pavement surface.
 - 3.2 Prior to applying the markings, the contractor shall remove all curing compounds on new Portland cement concrete surfaces.
 - 3.3 Prior to applying the markings, the contractor shall remove all dirt, sand, dust, oil, grease and any other contaminants from the road surface.
 - 3.4 Application over temporary paint is acceptable provided the following conditions are met:
 - 3.4.1 Temporary paint shall be a water-based material
 - 3.4.2 Temporary paint shall be applied at a dry mil thickness of 8 mils or less
 - 3.4.3 If Temporary paint is greater than 8 mils Temporary Line needs to be removed
 - 3.4.4 Temporary paint shall be well worn with minimal glass beads remaining
4. **Dimensions:** The reflectorized pavement markings shall be placed only on properly prepared surfaces and at the widths and patterns as designated on the contract plans. The markings shall be applied in accordance with the "Manual on Uniform Traffic Control Devices" and in accordance with the Engineer's plans.
5. **Other Restrictions:** The Engineer and/or contractor shall determine further restrictions and requirements of weather and pavement conditions necessary to meet the all other application specifications and produce markings that perform to the satisfaction of the Engineer.

6. **Binder Thickness:** The polyurea binder (mixed Part A and Part B) coating shall be applied at rates to achieve minimum uniform wet thicknesses as follows:

Surface Type	Recommended Polyurea Pavement Marking Thickness (1 inch=1000 mils)
Existing Smooth Asphalt or Concrete Surface	20 ± 2 mils
New Concrete Surface ¹	20 ± 2 mils
New Asphalt Surface (Standard Asphalt Mix)	20 ± 2 mils
Open Grade Friction Course (OGFC) or Stone Matrix Asphalt (SMA) ²	25 ± 2 mils
Rough Concrete or Asphalt	22 ± 2 mils
Concrete or asphalt after grinding off pavement markings ³	22 ± 2 mils

¹ Use thicker binder (20 mils) on new concrete surfaces with heavy tines.

² Very large aggregate sizes for open grade friction course or stone matrix asphalt mixes may require a thickness of 25 mils for proper coverage.

³ Pavement marking thickness determined by the type of surface and roughness/texture created from grinding operation.

7. **Reflective Media Application:** The contractor shall ensure that the reflective media are properly set in the polyurea coating so that their exposed portions are free of polyurea coating material. The specified reflective media shall be dropped per the manufacturers specified rates to achieve their recommended coating weights.
8. **Volumetric Proportioning:** The contractor shall ensure proper proportioning as required by manufacturers specifications and mixing of the polyurea components so that the markings are adequately hardened throughout and are free of soft or uncured material. Typically, such areas will darken over time from dirt and tire residue.
9. **Overspray:** The contractor shall ensure the polyurea coating does not exhibit excessive overspray.
10. **Adhesion:** The contractor shall ensure that the polyurea coating is well adhered to the road surface, and that the reflective media are well adhered to the binder.
11. **Marking Performance:** The typical average initial retroreflectance of the markings shall be 900 [(mcd(ft⁻²)(fc⁻¹)] for white and 700 [(mcd(ft⁻²)(fc⁻¹)] for yellow.

The average initial retroreflectance shall be determined according to the measurement and sampling procedures outlined in ASTM D 6359, using a 30 meter retroreflectometer. The 30 meter retroreflectometer shall measure the coefficient of retroreflected luminance, R_L, at an observation angle of 1.05 degrees and an entrance angle of 88.76 degrees. R_L shall be expressed in units of millicandelas per square foot per foot-candle [(mcd(ft⁻²)(fc⁻¹)]. The metric equivalent shall be expressed in units of millicandelas per square meter per lux [mcd(m⁻²)(lux⁻¹)].

Initial performance of pavement markings shall be measured within 14 days after application.

IV. Observation Period

Following initial completion of all pavement marking, there will be a 180 day observation period before final acceptance. During the observation period, the contractor, at no expense to the Department of Roads, shall replace any marking that the Engineer determines are not performing satisfactorily due to defective materials and/or workmanship in manufacture and/or application. At the end of the observation period the minimum required retention percentage for marking installed shall be 90%.

Determination of Percentage Retained - The percentage retained shall be calculated as the nominal area of the strip less the area of loss divided by the nominal area and expressed as a percentage of the nominal area. A claim, made by the State against the Contractor, shall be submitted to the Contractor in writing within 30 days after the 180 day observation period. When such a claim is made prior to August 1, the replacement material shall be installed during that same construction season. Replacement material for any claim after August 1, shall be installed prior to June 1, of the following year. Marking replacement shall be performed in accordance with requirement specified herein for the initial application, including but not limited to surface cleaning, sealer application, etc.

Final acceptance of all marking will include an inspection of the appearance of the markings during daylight and darkness. Any markings that fail to have a satisfactory appearance during either period, as determined by the Engineer, shall be reapplied at no expense to the Department of Roads.

Final acceptance of the pavement marking will be: (1) 180 days after the initial completion of all work, or (2) upon completion of all corrective work, whichever occurs last.

V. Certification of Compliance

The contractor shall furnish a manufacturer's certification that the material complies with the provisions of this specification.

VI. Contract Units and Basis for Payment

- A. Linear pavement markings will be measured in linear feet complete-in-place for the width specified.
- B. Retroreflective markings will be paid for at the contract unit price, which shall be full compensation for cleaning and preparing the pavement surface, for furnishing and placing all materials, and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

Subsection 423.01 of the 2007 Standard Specifications is amended to include the item: "Polyurea Pavement Marking, Grooved". The price shall be full compensation for grooving the pavement surface, furnishing and applying all markings, and for all materials, labor, tools, equipment and incidentals necessary to complete the work.

Payment will be made under:

<u>Pay Item</u>	<u>Pay Unit</u>
“***” Inch Polyurea Pavement Marking, Grooved	Linear Feet
Legend “***” Polyurea Pavement Marking, Grooved	Each
Arrow “***” Polyurea Pavement Marking, Grooved	Each

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Plan sheet 4 is void and superseded by added sheet 4A as depicted on the attached sheet.

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Upon execution of the contract, the plans will be revised to reflect these changes.

DEPARTMENT OF ROADS



Claude Oie
Construction Engineer

Issued: May 14, 2008

CO:410AD105

NOTICE: Only the contractors issued bidding proposals receive this addendum and responsibility for notifying any potential subcontractors or suppliers remains with the contractor.

